

Renesas Transistors / Thyristors / Triacs / Photocouplers Status List

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Introduction of Ultra Low Ron MOS FET for ORing "μPA276X Series"

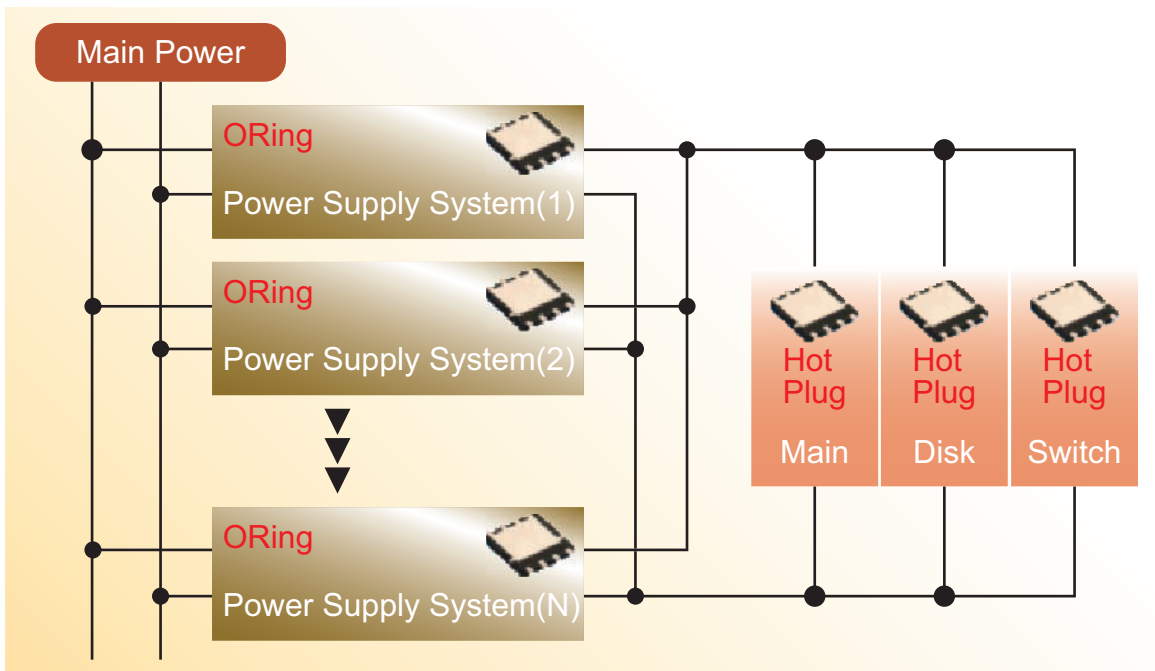
Outlines

Renesas has developed power MOSFETs with ultra low RDS(on).
These products contribute to power-saving and space-saving in network servers and storage system.

Features

- Improve power supply efficiency
 - Improve efficiency of power supply using ultra low Ron device (<1mΩ)
- Reduce quantity of devices used
 - Support for large current enables quantity of devices used in parallel to be reduced.

Block diagram of the server power supply circumference



- **ORing**
 - In the case of two or more power supply systems run in parallel, this device prevents reverse current.
 - The system can connect with power supply lines of devices, such as servers.
- **Hot-Plug**
 - Equipment can be removed while the power supply is on.
 - The system can connect with power supply lines of devices such as network storage.

Product Lineup

Part No.	Max. ratings			R _{DS(on)} (mΩ)				Package
	V _{DSS} (V)	V _{GSS} (V)	I _D (A)	V _{GS} = 10V		V _{GS} = 10V		
				Typ.	Max.	Typ.	Max.	
μPA2764T1A	30	+20/-20	130	0.90	1.10	1.72	2.41	8pin HVSON
μPA2765T1A	30	+20/-20	100	1.05	1.28	2.06	2.88	
μPA2766T1A	30	+20/-20	130	0.72	0.88	1.30	1.82	

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Bipolar Transistor	9	µPA2353T1P	4pin EFLIP-LGA	33	2SA1647-Z	MP-3	9	2SC5508(NE662M04)	F4Pin TSM1	11
Power Bipolar Transistor	9	µPA2354T1G	4pin EFLIP	33	2SA1647-Z	MP-3Z	9	2SC5509(NE663M04)	F4Pin TSM1	11
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Small Signal Bip-TRs for General Switching	10	µPA2371T1P	4pin EFLIP	33	2SA1648-Z	MP-3Z	9	2SC5664	SOP-8	9
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Power MOSFETs for High Frequency Amplifier	11	µPA2375T1P	4pin EFLIP	33	2SA1649-Z	MP-3Z	9	2SC5787(NE894M13)	3L2MM	11
Power MOSFETs for High Frequency Amplifier	11	µPA2379T1P	4pin EFLIP	33	2SA1741	MP-45F	9	2SC5801(NE851M13)	3L2MM	11
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		µPA2593T1H	8pin VSOFF (2429)	22	2SB800	3pin PoMM	9	2SD1699	3pin PoMM	10
		µPA2600T1H	8pin HUSON2020	22	2SB805	3pin PoMM	9	2SD1702	3pin PoMM	10
		µPA2601T1R	HUSON2020	22	2SB806	3pin PoMM	9	2SD1893	MP-3Z	9
		µPA2630T1R	6pinHUSON2020	19	2SB962	Z-3	9	2SD1899-Z	MP-3Z	9
		µPA2631T1R	6pinHUSON2020	19	2SB962-Z	MP-3Z	9	2SD1950	3pin PoMM	9
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FA4F3R	3pin MM	8	H5N5016PL	TO-3PL	30	HAT2240C	CMFFPAK6	24	NE5500179A	79A	11
FA4F4M	3pin MM	8	H5N6001P	TO-3P	31	HAT2244WP	WPAK	26	NE5500234	3pin PoMM	11
FA4F4N	3pin MM	8	H7N0203AB	TO-220AB	25	HAT2256R	SOP8	25	NE5500434	3pin PoMM	11
FA4F4Z	3pin MM	8	H7N0307AB	TO-220AB	22	HAT2266H	LFPAK	25	NE5500479A	79A	11
FA4L3M	3pin MM	8	H7N0307LD	LDPAK(L)/TO-262	22	HAT2268C	CMFFPAK6	20	NE5510279A	79A	11
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FA4L3Z	3pin MM	8	H7N0308AB	TO-220AB	22	HAT2275R	SOP8	25	NE5520279A	79A	11
FA4L4K	3pin MM	8	H7N0308LD	LDPAK(L)/TO-262	22	HAT2279H	LFPAK	26	NE5520379A	79A	11
FA4L4L	3pin MM	8	H7N0308LS	LDPAK(S)(-1)/TO-263	22	HAT2281C	CMFFPAK6	24	NE552R479A	79A	11
FA4L4M	3pin MM	8	H7N0311LD	LDPAK(L)/TO-262	21	HAT2282C	CMFFPAK6	24	NE552R679A	79A	11
FA4L4Z	3pin MM	8	H7N0311LS	LDPAK(S)(-1)/TO-263	21	HAT2284C	LFPAK	24	NE5531079A	79A	11
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FB1A4M	3pin MM	8	H7N0312LS	LDPAK(S)(-1)/TO-263	22	HAT2291C	CMFFPAK6	19	NE5550279A	79A	11
FB1F3P	3pin MM	8	H7N0602LD	LDPAK(L)/TO-262	26	HAT2292C	CMFFPAK6	19	NE5550779A	79A	11
FB1J3P	3pin MM	8	H7N0603LS	LDPAK(S)(-1)/TO-263	26	HAT2299WP	WPAK	27	NE5550979A	79A	11
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NP50P06KDG	MP-25ZK/TO-263	17	PS2502-1	4pin-DIP	39	PS9505L3	8pin-DIP(LF)	42	RJH60F6DPQ-A0	TO-247A	34
NP50P06SDG	MP-32K/TO-252	17	PS2502L-1	4pin-DIP(LF)	39	PS9506	8pin-DIP	42	RJH60F7ADPK	TO-3P	34
NP52N055SUG	MP-32K/TO-252	24	PS2502L-4	16pin-DIP(LF)	39	PS9506L1	8pin-DIP(LF-L1)	42	RJH60F7BDPQ-A0	TO-247A	34
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NP60N04VUG	MP-32P/TO-252	22	PS2514L-1	4pin-DIP(LF)	38	PS9587L4	8pin-DIP(LF-L4)	41	RJH60V1BDPP-M0	LDPAK(S-1)	34
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NP60N055NUE	MP-25SK/TO-262	24	PS2533L-1	4pin-DIP(LF)	39	PS9821-1	8pin-SSOP	41	RJH60V2BDPP-M0	TO-220FL	34
NP60N055VUG	MP-32P/TO-252	24	PS2535-1	4pin-DIP	39	PS9822-1	8pin-SSOP	41	RJH60V3BDPE	LDPAK(S-1)	34
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NP80N03MLE	MP-25K/TO-220	22	PS2565L-1	4pin-DIP(LF)	40	RZJ2065ANP	QFN-40	33	RJH60S4DPA	WPAK	21
NP80N03NDE	MP-25SK/TO-262	22	PS2565L-1	4pin-DIP(LF-L1)	40	RZJ2065ANP	QFN-40	33	RJH60S5DPA	WPAK	21
NP80N03NLE	MP-25SK/TO-262	22	PS2565L-2	4pin-DIP(LF-L2)	40	RZJ2065ANP	QFN-40	33	RJH60S6DPA	WPAK	21
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RJK0223DNS	HWSON3046-8	20	RJK1212DPA	WPAK	27	RJK6014DPK	TO-3P	31	RJP6065DPM	TO-3PFM	34
RJK0225DNS	8pin HVSON (3333)	20	RJK1525DPE	LDPK(S)(-1)/TO-263	27	RJK6014DPP-E0	TO-220FP	31	RJP6085DPK	TO-3P	34
RJK0226DNS	8pin HVSON (3333)	20	RJK1525DPP-M0	TO220FL	27	RJK6015DPP	TO-3P	31	RJP6085DPN-00	TO-220AB	34
RJK0230DPA	WPAK-D	20	RJK1526DPE	LDPK(S)(-1)/TO-263	28	RJK6015DPP-E0	TO-3PN	31	RJQ6003DPM	TO-3PFM5	34
RJK0234DNS	8pin HVSON (3333)	20	RJK1526DPJ	LDPK(L)/TO-262	28	RJK6015DPM	TO-3PFM	31	RJQ6003DPM	TO-3PFM-5	35
RJK0236DPA	WPAK	20	RJK1529DPK	TO-3P	28	RJK6018DPK	TO-3P	31	RJQ6008DPM	TO-3PFM5	34
RJK0240DNS	HWSON-8	20	RJK1535DPE	LDPK(S)(-1)/TO-263	28	RJK6018DPM	TO-3PFM	31	RJQ6008DPM	TO-3PFM-5	35
RJK0243DNS	HWSON-8	20	RJK1536DPE	LDPK(S)(-1)/TO-263	28	RJK6020DPK	TO-3P	31	RJQ6015DPM	TO-3PFM5	34
RJK0305DPA	LFPK	21	RJK1536DPN	TO-220AB	28	RJK6022DJE	TO-92 MOD	30	RJQ6015DPM	TO-3PFM-5	35
RJK0323JPD	DPK(S)/TO-252	21	RJK1555DPA	WPAK	27	RJK6024DP3-A0	SOT-223A	30	RJQ6020DPM	TO-3PFM-5	35
RJK0323JPD	DPK(S)	33	RJK1557DPA	WPAK	27	RJK6024DPP	MP-3A/TO-252	30	RJQ6021DPM	TO-3PFM-5	35
RJK0328DPP-B01	LFPK	22	RJK1560DPP-M0	TO-220FL	27	RJK6024DPE	LDPK(S)(-1)/TO-263	30	RJQ6022DPM	TO-3PFM-5	35
RJK0329DPP-B01	LFPK	22	RJK1562DJE	UPAK/SC-62	27	RJK6025DPP	MP-3A/TO-252	30	RJS60041DPN-EJ	TO-220AB	35
RJK0330DPP-B01	LFPK	22	RJK1575DPA	WPAK(3F)	27	RJK6025DPE	LDPK(S)(-1)/TO-263	30	RJS60041DPP-EJ	TO-220FP	35
RJK0331DPP-B01	LFPK	21	RJK1576DPA	WPAK(3F)	27	RJK6025DPP-E0	TO-251	30	RJS6004WDPK-00	TO-3P	35
RJK0332DPP-B01	LFPK	21	RJK2006DPE	LDPK(S)(-1)/TO-263	28	RJK6026DPE	LDPK(S)(-1)/TO-263	30	RJS60051DPP-EJ	TO-220AB	35
RJK0348DSP	SOP8	21	RJK2006DPJ	LDPK(L)/TO-262	28	RJK6026DPP-E0	TO-220FP	30	RJS60051DPP-EJ	TO-220FP	35
RJK0349DSP	SOP8	21	RJK2009DPM	TO-3PFM	28	RJK6029DJA	TO-92(1)	30	RJS6005WDPK-00	TO-3P	35
RJK0351DSP	SOP8	21	RJK2017DPE	LDPK(S)(-1)/TO-263	28	RJK6032DPP	MP-3A/TO-252	30	RJU36B1WDPK-M0	TO-3PSG	35
RJK0352DSP	SOP8	21	RJK2017DPP-M0	TO-220FL	28	RJK6032DPP-E0	TO-251	30	RJK6032WDPK-M0	TO-3PSG	35
RJK0353DSP	SOP8	21	RJK2055DPA	WPAK	28	RJK6034DPP-E0	TO-252	30	RJU60B41DPP-EJ	TO-220FP	35
RJK0354DSP	SOP8	21	RJK2057DPA	WPAK	28	RJK6034DPP-E0	TO-220FP	31	RJU60C3SDPP-E0	TO-252	35
RJK0355DSP	SOP8	21	RJK2061JPE	LDPK(S)(-1)/TO-263	28	RJK6035DPP-E0	TO-220FP	30	RJU60C21DPP-EJ	TO-220FP	35
RJK0358DPA	WPAK	33	RJK2061JPE	LDPK(S)(-1)	33	RJK6036DP3-A0	SOT-223	30	RJU60C3SDPP-E0	TO-252	35
RJK0358DSP	FP-8DA	33	RJK2062JPK	TO-3P	28	RJL6055DPE	LDPK(S)(-1)/TO-263	31	RJU60C31DPP-EJ	TO-220FP	35
RJK0362DSP	FP-8DA	33	RJK2062JPK	TO-3P	33	RJL6055DDPK-M0	TO-3PSG	31	RJU60C3WDPK-M0	TO-3PSG	35
RJK0389DPA	WPAK-D	21	RJK2075DPA	WPAK(3F)	27	RJL6055DPP-E0	TO-220FP	31	RJU60C3WDPK-M0	TO-220FL	35
RJK0406JPE	LDPK(S)(-1)/TO-263	23	RJK2076DPA	WPAK(3F)	27	RJL5012DPE	LDPK(S)(-1)/TO-263	30	RJU60C6SDPE	LDPK(S)(-1)	35
RJK0406JPE	LDPK(S)(-1)	33	RJK2508DPK	TO-3P	29	RJL5012DPP-E0	TO-220FP	30	RJU60C6SDPK-M0	TO-3PSG	35
RJK0451DPA	LFPK	22	RJK2511DPK	TO-3P	29	RJL5012DPP-M0	TO-220FL	30	RJU60C61DPP-EJ	TO-220FP	35
RJK0452DPA	LFPK	22	RJK2555DPA	WPAK	29	RJL5013DPE	LDPK(S)(-1)/TO-263	30	RJU60C6WDPK-M0	TO-3PSG	35
RJK0453DPA	LFPK	22	RJK2557DPA	WPAK	29	RJL5013DPP-E0	TO-220FP	30	RJU3051SDPE	LDPK(S)(-1)	35
RJK0454DPA	LFPK	22	RJK2575DPA	WPAK(3F)	29	RJL5014DPK	TO-3P	30	RJU3052SDPP-E0	TO-252	35
RJK0455DPA	LFPK	22	RJK2576DPA	WPAK(3F)	29	RJL5014DPP-E0	TO-220FP	30	RJU4351SDPE	LDPK(S)(-1)	35
RJK0460DPP-E0	TO-220AB	26	RJK3008DPK	TO-3P	29	RJL5015DPK	TO-3P	30	RJU43511DPP-EJ	TO-220FP	35
RJK0601DPP-E0	TO-220AB	26	RJK3018DPK-M0	TO-3PSG	29	RJL5018DPK	TO-3P	30	RJU4352SDPP-E0	TO-252	35
RJK0602DPP-E0	TO-220AB	26	RJK4002DJE	TO-92 Mod	28	RJL5020DPK	TO-3P	30	RJU4352SDPE	LDPK(S)(-1)	35
RJK0603DPP-E0	TO-220AB	26	RJK4002DPP	MP-3A/TO-252	29	RJL5032DPP-M0	TO-220FL	29	RJU43521DPP-EJ	TO-220FP	35
RJK0628JPE	LDPK(S)(-1)/TO-263	26	RJK4002DPP-E0	TO-251	29	RJL6012DPE	LDPK(S)(-1)/TO-263	31	RJU6052SDPP-E0	TO-252	35
RJK0628JPE	LDPK(S)(-1)	33	RJK4002DPP-M0	TO-220FL	29	RJL6013DPE	LDPK(S)(-1)/TO-263	31	RJU6052SDPE	LDPK(S)(-1)	35
RJK0629DPE	LDPK(S)(-1)/TO-263	26	RJK4006DPP	MP-3A/TO-252	29	RJL6013DPP-E0	TO-220FP	31	RJU60521DPP-EJ	TO-220FP	35
RJK0629DPE	TO-3P	26	RJK4006DPP-M0	TO-220FL	29	RJL6015DPK	TO-3P	31	RJU6053SDPE	LDPK(S)(-1)	35
RJK0629DPP	TO-220AB	26	RJK4007DPP-M0	TO-220FL	29	RJL6018DPK	TO-3P	31	RJU60531DPP-EJ	TO-220FP	35
RJK0629JPE	LDPK(S)(-1)/TO-263	26	RJK4012DPE	LDPK(S)(-1)/TO-263	29	RJL6020DPK	TO-3P	31	RJU6053WDPK-M0	TO-3PSG	35
RJK0629JPE	LDPK(S)(-1)	33	RJK4013DPE	LDPK(S)(-1)/TO-263	29	RJL6032DPP-M0	TO-220FL	30	RJU6053WDPK-M0	TO-220FL	35
RJK0630JPE	LDPK(S)(-1)/TO-263	26	RJK4014DPK	TO-3P	29	RJM0404JSC	HSOP20	22	RJU6054SDPE	LDPK(S)(-1)	35
RJK0630JPE	LDPK(S)(-1)	33	RJK4015DPK	TO-3P	29	RJM0404JSC	HSOP-20	33	RJU6054SDPK-M0	TO-3PSG	35
RJK0631JPD	DPK(S)/TO-252	25	RJK4018DPK	TO-3P	29	RJM0407JSC	HSOP20	22	RJU60541DPP-EJ	TO-220FP	35
RJK0631JPD	DPK(S)	33	RJK4034DJE	TO-92 Mod	29	RJM0803JSC	HSOP20	25	RJU6054WDPK-M0	TO-3PSG	35
RJK0631JPE	LDPK(S)(-1)/TO-263	25	RJK4036DP3-A0	SOT-223	29	RJM0803JSC	HSOP-20	33	RGA0004FXDQS	UPAK	11
RJK0631JPE	LDPK(S)(-1)	33	RJK4502DJE	TO-92 Mod	29	RJP1CS03DWA	Wafer	34	ROA0005YXDQS	UPAK	11
RJK0631JPR	TO-220FM	25	RJK4502DPP	MP-3A/TO-252	29	RJP1CS03DWT	Wafer	34	ROA0008YXDQS	UPAK	11
RJK0632JPD	DPK(S)/TO-252	25	RJK4512DPE	LDPK(S)(-1)/TO-263	29	RJP1CS04DWA	Wafer	34	ROA00091XDQS	UPAK	11
RJK0632JPD	DPK(S)	33	RJK4513DPE	LDPK(S)(-1)/TO-263	29	RJP1CS04DWT	Wafer	34	ROA0010YXDQS	UPAK	11
RJK0636JPD	DPK(S)/TO-252	25	RJK4514DPK	TO-3P	29	RJP1CS05DWA	Wafer	34	ROA0011DNS	WSON0504-2	11
RJK0636JPD	DPK(S)	33	RJK4515DPK	TO-3P	29	RJP1CS05DWT	Wafer	34	RQJ0201UGDQA	MPAK/SC-59	19
RJK0651DPA	LFPK	25	RJK4518DPK	TO-3P	29	RJP1CS06DWA	Wafer	34	RQJ0202VGDQA	MPAK/SC-59	19
RJK0652DPA	LFPK	25	RJK4532DPP	MP-3A/TO-252	29	RJP1CS06DWT	Wafer	34	RQJ0203WGDQA	MPAK/SC-59	19
RJK0653DPA	LFPK	25	RJK4532DPP-E0	TO-251	29	RJP1CS07DWA	Wafer	34	RQJ0204XGDQA	MPAK/SC-59	19
RJK0654DPA	LFPK	25	RJK4536DP3-A0	SOT-223	29	RJP1CS07DWT	Wafer	34	RQJ0301HGDQS	UPAK/SC-62	18
RJK0655DPA	LFPK	25	RJK5002DJE	TO-92 Mod	29	RJP1CS08DWA	Wafer	34	RQJ0302NGDQA	MPAK/SC-59	19
RJK0656DPA	LFPK	25	RJK5002DPP	MP-3A/TO-252	29	RJP1CS08DWT	Wafer	34	RQJ0303PGDQA	MPAK/SC-59	18
RJK0657DPA	WPAK	25	RJK5003DPP	MP-3A	30	RJP3054DPN-00	TO220FN	34	RQJ0304QGDQA	MPAK/SC-59	19
RJK0658DPA	WPAK	25	RJK5006DPP	MP-3A/TO-252	30	RJP30E2DPK-M0	TO3PSG	34	RQJ0304QDQDS	UPAK/SC-62	18
RJK0659DPA	WPAK	25	RJK5012DPE	LDPK(S)(-1)/TO-263	30	RJP30E2DPP-M0	TO-220FL	34	RQJ0305EQDQA	MPAK/SC-59	19
RJK0660DPA	WPAK	25	RJK5012DPP-E0	TO-220FP	30	RJP30E3DPK-M0	TO-3PSG	34	RQJ0305EQDQS	UPAK/SC-62	18
RJK0701DPP-E0	TO-220AB	26	RJK5012DPP-M0	TO-220FL	30	RJP30E3DPP-E0	TO-220FL	34	RQJ0306FQDQA	MPAK/SC-59	19
RJK0701DPP-E0	TO-220FP	26	RJK5013DPE	LDPK(S)(-1)/TO-263	30	RJP30H1DPP	TO-252	34	RQJ0306FQDQS	UPAK/SC-62	18
RJK0702DPP-E0	TO-220AB	26	RJK5013DPP	TO-3P	30	RJP30H1DPP-M0	TO-220FL	34	RQJ0601VGDQA	UPAK/SC-62	18
RJK0702DPP-E0	TO-220FP	26	RJK5013DPP-E0	TO-220FP	30	RJP30H2DPP-M0	TO-3PSG	34	RQJ0602EGDQA	MPAK/SC-59	18
RJK0703DPP-E0	TO-220AB	26	RJK5014DPK	TO-3P	30	RJP30K3DPP-M0	TO-220FL	34	RQJ0602EGDQS	UPAK/SC-62	18
RJK0703DPP-E0	TO-220FP	26	RJK5014DPP-E0	TO-220FP	30	RJP600DDPE	LDPK(S)	34	RQJ0603LGDQA	MPAK/SC-59	18
RJK0851DPA	LFPK	26	RJK5015DPK	TO-3P	30	RJP600DDPK	TO-3P	34	RQK0201QGDQA	MPAK/SC-59	20
RJK0852DPA	LFPK	26	RJK5015DPK-E0	TO-3PN	30	RJP600DDPP-M0	TO-3PFM	34	RQK0202RGDQA	MPAK/SC-59	20
RJK0853DPA	LFPK	26	RJK5015DPM	TO-3PFM	30	RJP600DDPP-M0	TO-220FL	34	RQK0203SGDQA	MPAK/SC-59	20
RJK0854DPA	LFPK	26	RJK5018DPK	TO-3P	30	RJP600DPE	LDPK(S)(-1)	34	RQK02041GDQA	MPAK/SC-59	20
RJK0855DPA	LFPK	26	RJK5020DPK	TO-3P	30	RJP600DPM	TO-3PFM	34	RQK0301FGDQS	UPAK/SC-62	20
RJK0856DPA	LFPK	26	RJK5026DPE	LDPK(S)(-1)/TO-263	30	RJP60F4DPM	TO-3PFM	34	RQK0302GGDQA	MPAK/SC-59	20
RJK1001DPP-E0	TO-220AB	27	RJK5026DPP-E0	TO-220FP	30	RJP60F4DPP-A0	TO-247A	34	RQK0302GGDQS	UPAK/SC-62	20
RJK1001DPP-E0	TO-220FP	27	RJK5026DPP-M0	TO-220FL	30	RJP60F5DPK	TO-3P	34	RQK0303MGDQA	MPAK/SC-59	20
RJK1002DPP-E0	TO-220AB	27	RJK5030DPP	MP-3A/TO-252	29	RJP60F5DPM	TO-3PFM	34	RQK06011GDQS	UPAK/SC-62	25
RJK1002DPP-E0	TO-220FP	27	RJK5030DPP-M0	TO-220FL	29	RJP60F7DPK	TO-3P	34	RQK0603CGDQA	MPAK/SC-59	24
RJK1003DPP-E0	TO-220AB	27	RJK5031DPP	MP-3A/TO-252	29	RJP60V0DPM	TO-3PFM	34	RQK0603CGDQS	UPAK/SC-62	24
RJK1003DPP-E0	TO-220FP	27	RJK5032DPP	MP-3A/TO-252	29	RJP63F3DPP-M0	TO-220FL	34	RQK06041GDQA	MPAK/SC-59	24
RJK1008DPE	LDPK(S)(-1)/TO-263	27	RJK5032DPP-E0	TO-251	29	RJP63K2DPP-M0	TO-3PSG	34	RQK06051GDQA	MPAK/SC-59	24
RJK1008DPE	LDPK(S)(-1)/TO-263	27	RJK5032DPP-M0	TO-220FP	29	RJP65S03DWA	Wafer	34	RQK0606KGDQA	MPAK/SC-59	24
RJK1008DPP-E0	TO-220FP	27	RJK5033DPP	MP-3A/TO-252	30	RJP65S03DWT	Wafer	34	RQK0607AQDQS	UPAK/SC-62	24
RJK1012DPE	LDPK(S)(-1)/TO-263	27	RJK5034DPP-E0	TO-220FL	29	RJP65S04DWA	Wafer	34	RQK0608BQDQS		

Transistor with Internal Resistor

Package	Part No.	Ratings				Characteristics					Equivalent Circuit	Status	
		V _{CEO} (V)	V _{CE0} (V)	V _{EB0} (V)	I _c (mA)	h _{fe} min.	h _{fe} max.	P _T (mW)	R ₁ (kΩ)	R ₂ (kΩ)			
3pin MM	FA4A3Q	60	50	15	100	35	100	200	1	10	A	O	
	FA4A4L			5		20	80	200	10	4.7		O	
	FA4A4M			10		35	100	200	10	10		O	
	FA4A4P			5		85	340	200	10	4.7		O	
	FA4A4Z			5		135	600	200	10	-		O	
	FA4F3M			10		8	50	200	2.2	2.2		O	
	FA4F3P			5		35	100	200	2.2	10		O	
	FA4F3R			5		85	340	200	2.2	4.7		O	
	FA4F4M			10		60	195	200	2.2	2.2		O	
	FA4F4N			5		85	340	200	2.2	4.7		O	
	FA4F4Z			5		135	600	200	2.2	-		O	
	FA4L3M			10		20	80	200	4.7	4.7		O	
	FA4L3N			5		35	100	200	4.7	10		O	
	FA4L3Z			5		135	600	200	4.7	-		O	
	FA4L4K			25		35	100	200	4.7	10		O	
	FA4L4L			15		60	195	200	4.7	2.2		O	
	FA4L4M			10		85	340	200	4.7	4.7		O	
	FA4L4Z			5		135	600	200	4.7	-		O	
	FB1A3M		30	25	10	700	80	-	200	1	1	O	
	FB1A4A				10		300	-	200	-	10	O	
	FB1A4M				10		300	-	200	10	10	O	
	FB1F3P				10		300	-	200	2.2	10	O	
	FB1J3P				10		300	-	200	3.3	10	O	
	FB1L2Q				10		150	-	200	0.47	4.7	O	
	FB1L3N				10		300	-	200	4.7	10	O	
	FN4A3Q		-60	-50	-5	-100	35	100	200	1	10	B	O
	FN4A4L				-15		20	80	200	10	4.7		O
	FN4A4M				-10		35	100	200	10	10		O
	FN4A4P				-5		85	340	200	10	4.7		O
	FN4A4Z				-5		135	600	200	10	-		O
	FN4F3M				-10		8	50	200	2.2	2.2		O
	FN4F3P				-5		35	100	200	2.2	10		O
	FN4F3R				-5		85	340	200	2.2	4.7		O
	FN4F4M				-10		60	195	200	2.2	2.2		O
	FN4F4N				-5		85	340	200	2.2	4.7		O
	FN4F4Z				-5		135	600	200	2.2	-		O
	FN4L3M				-10		20	80	200	4.7	4.7		O
	FN4L3N				-5		35	100	200	4.7	10		O
	FN4L3Z				-5		135	600	200	4.7	-		O
	FN4L4K				-25		35	100	200	4.7	10		O
FN4L4L				-15		60	195	200	4.7	2.2		O	
FN4L4M				-10		85	340	200	4.7	4.7		O	
FN4L4Z				-5		135	600	200	4.7	-		O	
FP1A3M		-25	-25	-10	-700	100	-	200	1	1	O		
FP1A4A				-10		100	-	200	-	10	O		
FP1A4M				-10		100	-	200	10	10	O		
FP1F3P				-10		100	-	200	2.2	10	O		
FP1J3P				-10		100	-	200	3.3	10	O		
FP1L2Q				-10		100	-	200	0.47	4.7	O		
FP1L3N				-10		100	-	200	4.7	10	O		
3pin PoMM	HD1A3M	80	60	10	1000	200	-	2000	1	1	A	O	
	HD1A4A			10		300	-	2000	-	10		O	
	HD1A4M			10		300	-	2000	10	10		O	
	HD1F2Q			10		300	-	2000	0.22	2.2		O	
	HD1F3P			10		300	-	2000	2.2	10		O	
	HD1L2Q			10		300	-	2000	0.47	4.7		O	
	HD1L3N			10		300	-	2000	4.7	10		O	
	HD2A3M	60	60	10	1000	200	-	2000	1	1	C	O	
	HD2A4A			10		300	-	2000	-	10		O	
	HD2A4M			10		300	-	2000	10	10		O	
	HD2F2Q			10		300	-	2000	0.22	2.2		O	
	HD2F3P			10		300	-	2000	2.2	10		O	
	HD2L2Q			10		300	-	2000	0.47	4.7		O	
	HD2L3N			10		300	-	2000	4.7	10		O	
	HQ1A3M	-20	-20	-10	-2000	100	-	2000	1	1	B	O	
	HQ1A4A			-10		150	-	2000	-	10		O	
	HQ1F2Q			-10		150	-	2000	0.22	2.2		O	
	HQ1F3M			-10		150	-	2000	2.2	2.2		O	
	HQ1F3P			-10		150	-	2000	2.2	10		O	
	HQ1L2N			-10		150	-	2000	0.47	1		O	
HQ1L2Q			-10		150	-	2000	0.47	4.7		O		
HR1A3M	-60	-60	-10	-1000	100	-	2000	1	1		O		
HR1A4A			-10		100	-	2000	-	10		O		
HR1A4M			-10		100	-	2000	10	10		O		
HR1F2Q			-10		100	-	2000	0.22	2.2		O		
3pin SSP	GA4A3Q	60	50	5	100	35	100	150	1	10	A	O	
	GA4A4L			15		20	80	150	10	4.7		O	
	GA4A4M			10		35	100	150	10	10		O	
	GA4A4P			5		85	340	150	10	4.7		O	
	GA4A4Z			5		135	600	150	10	-		O	
	GA4F3M			10		8	50	150	2.2	2.2		O	
	GA4F3P			5		35	100	150	2.2	10		O	
	GA4F3R			5		85	340	150	2.2	4.7		O	
	GA4F4M			10		60	195	150	2.2	2.2		O	
	GA4F4N			5		85	340	150	2.2	4.7		O	
	GA4F4Z			5		135	600	150	2.2	-		O	
	GA4L3M			10		20	80	150	4.7	4.7		O	
	GA4L3N			5		35	100	150	4.7	10		O	
	GA4L3Z			5		135	600	150	4.7	-		O	
	GA4L4K			25		35	100	150	4.7	10		O	
	GA4L4L			15		60	195	150	4.7	2.2		O	
	GA4L4M			10		85	340	150	4.7	4.7		O	
	GA4L4Z			5		135	600	150	4.7	-		O	
	GN4A3Q	-60	-50	-5	-100	35	100	150	1	10	B	O	
	GN4A4L			-15		20	80	150	10	4.7		O	
GN4A4M			-10		35	100	150	10	10		O		
GN4A4P			-5		85	340	150	10	4.7		O		
GN4A4Z			-5		135	600	150	10	-		O		
GN4F3M			-10		8	50	150	2.2	2.2		O		
GN4F3P			-5		35	100	150	2.2	10		O		
GN4F3R			-5		85	340	150	2.2	4.7		O		
GN4F4M			-10		60	195	150	2.2	2.2		O		
GN4F4N			-5		85	340	150	2.2	4.7		O		
GN4F4Z			-5		135	600	150	2.2	-		O		
GN4L3M			-10		20	80	150	4.7	4.7		O		
GN4L3N			-5		35	100	150	4.7	10		O		
GN4L3Z			-5		135	600	150	4.7	-		O		
GN4L4K			-25		35	100	150	4.7	10		O		
GN4L4L			-15		60	195	150	4.7	2.2		O		
GN4L4M			-10		85	340	150	4.7	4.7		O		
GN4L4Z			-5		135	600	150	4.7	-		O		
3pin USM	KA4A3Q	60	50	5	100	35	100	150	1	10	A	O	
	KA4A4L			15		20	80	150	10	4.7		O	
	KA4A4M			10		35	100	150	10	10		O	
	KA4A4P			5		85	340	150	10	4.7		O	
	KA4A4Z			5		135	600	150	10	-		O	
	KA4F3M			10		8	50	150	2.2	2.2		O	
	KA4F3P			5		35	100	150	2.2	10		O	
	KA4F3R			5		85	340	150	2.2	4.7		O	
	KA4F4M			10		60	195	150	2.2	2.2		O	
	KA4F4N			5		85	340	150	2.2	4.7		O	
	KA4F4Z			5		135	600	150	2.2	-		O	
	KA4L3M			10		20	80	150	4.7	4.7		O	
	KA4L3N			5		35	100	150	4.7	10		O	
	KA4L3Z			5		135	600	150	4.7	-		O	
	KA4L4K			25		35	100	150	4.7				

Small Signal Bip-TRs for General Amplifier

Package	Part No.	Ratings		Characteristics			Device Type	Status
		V _{CEO} (V)	I _C (mA)	hfe1		P _T (mW)		
				min.	max.			
3pin MM	2SA1226	-40	-30	40	180	200	FM/FM RF/ RF/MIX/CON	O
	2SA1330	-200	-100	90	450	200		O
	2SA1464	-40	-500	75	300	200		O
	2SA811A	-120	-50	135	900	200	Audio Frequency Amplification	O
	2SA812	-50	-100	90	600	200	Audio Frequency Amplification	O
	2SB624	-25	-700	110	400	200		O
	2SB736	-60	-300	110	400	200		O
	2SB736A	-80	-300	110	400	200		O
	2SC1009A	30	50	60	180	200	FM AM/FM/ AM MIX/OSC/IF	O
	2SC1622A	120	50	135	900	200		O
	2SC1623	50	100	90	600	200	Audio Frequency Amplification	O
	2SC1654	160	50	90	400	150		O
	2SC2223	20	20	40	180	150	FM/FM RF/ RF/MIX/CON	O
	2SC3360	200	100	90	400	200		O
	2SC3624	50	150	1000	3200	200	Audio Frequency Amplification	O
	2SC3624A	50	150	1000	3200	200	Audio Frequency Amplification	O
	2SC3739	40	500	75	300	200		O
	2SD596	25	700	110	400	200		O
	2SD780	60	300	110	400	200		O

Package	Part No.	Ratings		Characteristics			Device Type	Status	
		V _{CEO} (V)	I _C (mA)	hfe1		P _T (mW)			
				min.	max.				
3pin MM	2SD780A	80	300	110	400	200		O	
3pin PoMM	2SB1114	-20	-2000	135	600	2000		O	
	2SB1115	-50	-1000	135	600	2000		O	
3pin SSP	2SA1608	-40	-500	75	300	150		O	
	2SA1611	-50	-100	90	600	150	Audio Frequency Amplification	O	
	2SA1612	-120	-50	135	900	150	Audio Frequency Amplification	O	
	2SB1475	-16	-500	110	400	150	Audio Frequency Amplification	O	
	2SC4173	40	500	75	300	150		O	
	2SC4177	50	100	90	600	150	Audio Frequency Amplification	O	
	2SC4178	20	20	40	180	150	FM/FM RF/ RF/MIX/CON	O	
	2SC4179	30	50	60	180	150	FM AM/FM/ AM MIX/OSC/IF	O	
	2SC4180	120	50	135	900	150	Audio Frequency Amplification	O	
	2SC4181	50	150	1000	3200	150	Audio Frequency Amplification	O	
	3pin USM	2SA1836	-50	-100	90	600	200	Audio Frequency Amplification	O
		2SC4783	50	100	90	600	200	Audio Frequency Amplification	O
MP-2	2SD2425	60	5000	100	400	2000		O	

Package	Part No.	Ratings		Characteristics		Status
		V _{CEO} (V)	I _C (A)	hFE	V _{CE(sat)} (V) max	
UPAK	2SD1368	50	1	100 to 500	0.3	O•
	2SD1418	80	1	60 to 320	1	O•
	2SD1419	100	1	60 to 200	1	Δ•
	2SC3380	300	0.1	30 to 200	1.5	O•
	2SB1002	-50	-1	160 to 320	-0.6	O•
	2SB1025	-80	-1	60 to 320	-1	O•
	2SB1026	-100	-1	60 to 200	-1	O•

Package	Part No.	Ratings		Characteristics		Status
		V _{CEO} (V)	I _C (A)	hFE	V _{CE(sat)} (V) max	
MPAK	2SD1306	15	0.7	250 to 800	0.5	O•
	2SC2618C	35	0.5	60 to 320	0.6	O•
	2SD2655	50	1	200 to 500	0.3	O•
	2SC4050	120	0.1	250 to 800	0.1	O•
	2SC4702	300	0.05	60 to 150	0.5	O•
	2SA1121	-35	-0.5	60 to 320	-0.6	O•
	2SB1691	-50	-1	200 to 500	-0.3	O•

Small Signal Bip-TRs for General Switching

Package	Part No.	Ratings		Characteristics			Device Type	Status
		V _{CEO} (V)	I _C (mA)	hfe1		P _T (mW)		
				min.	max.			
3pin PoMM	2SD1699	80	800	4000	50000	2000		O
	2SD1702	60	800	4000	50000	2000		O
MP-2	2SA1871	-600	-1000	30	120	2000		O
	2SC4942	600	1000	30	120	2000		O

Notes) Production Status O: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date(Lead time: 3 months)

Ordering Condition ♦: Large order only
 (Unit: Refer to packing unit (P.47 to 49))

Small Signal Bip-TRs for High Frequency Amplifier

Package	Part No.	Ratings		Characteristics				Cob (pF) max	Status
		V _{CEO} (V)	I _c (A)	f _r (GHz) typ	NF (dB) typ	f (GHz)	f (GHz)		
3L2MM	2SC5801 (NE851M13)	5.5	0.1	6.5	1.9	2	-	0	
	2SC5787 (NE894M13)	3	0.035	20	1.4	2	-	0	
3pin MM	2SA1977 (NE97733)	-12	-0.05	8.5	1.5	1	-	0	
	2SC3585 (NE68033)	10	0.035	10	1.8	2	-	0	
	2SC3583 (NE68133)	10	0.065	9	1.2	1	-	0	
	2SC3356 (NE85633)	12	0.1	7	1.1	1	-	0	
	2SA1978 (NE97833)	-12	-0.05	5.5	2	1	-	0	
	2SC4703 (NE46234)	12	0.15	6	2.3	1	1.5	0	
3pin PoMM	2SC4536 (NE46134)	15	0.25	5.3	2	1	-	0	
	2SC3357 (NE85634)	12	0.1	6.5	1.1	1	-	0	
	2SC4571 (NE58230)	12	0.06	5	-	-	0.9	0	
3pin SSP	2SC4570 (NE58130)	12	0.03	5.5	-	-	0.7	0	
	2SC4228 (NE68030)	10	0.035	8	1.9	2	-	0	
	2SC4227 (NE68130)	10	0.065	7	1.4	1	-	0	
	2SC4226 (NE85630)	12	0.1	4.5	1.2	1	-	0	
	NE202930	6	0.1	11	1.5	1	-	0	
	2SC5606 (NE66219)	3.3	0.035	21	1.2	2	-	0	
3pin USM	2SC5186 (NE68719)	3	0.03	11	1.3	2	-	0	
	2SC5181 (NE68619)	3	0.01	13	1.5	2	-	0	
	2SC5010 (NE68519)	6	0.03	12	1.5	2	-	0	
	2SC5008 (NE68019)	10	0.035	8	1.9	2	-	0	
	2SC5007 (NE68119)	10	0.065	7	1.4	1	-	0	
	2SC5006 (NE85619)	12	0.1	4.5	1.2	1	-	0	
	2SC5005 (NE85619)	12	0.1	4.5	1.2	1	-	0	
	2SC5004 (NE85619)	12	0.1	4.5	1.2	1	-	0	

Package	Part No.	Ratings		Characteristics				Cob (pF) max	Status
		V _{CEO} (V)	I _c (A)	f _r (GHz) typ	NF (dB) typ	f (GHz)	f (GHz)		
3pin USM	2SC5004 (NE58219)	12	0.06	5	-	-	-	0	
4pin MM	2SC5455 (NE67839)	6	0.1	12	1.5	2	-	0	
	2SC5454 (NE67739)	6	0.05	14.5	1.5	2	-	0	
	2SC4957 (NE68539E)	6	0.03	12	1.5	2	-	0	
	2SC4095 (NE68039E)	10	0.035	10	1.8	2	-	0	
	2SC4094 (NE68139E)	10	0.065	9	1.2	1	-	0	
	2SC4093 (NE85639E)	12	0.1	6.5	1.1	1	-	0	
4pin PoMM	2SC5338 (NE462M02)	12	0.15	6	2.5	1	-	0	
	2SC5337 (NE461M02)	15	0.25	5.3	1.5	0.5	-	0	
	2SC5336 (NE856M02)	12	0.1	6.5	1.1	1	-	0	
4pin SMM	2SC5185 (NE68718)	3	0.03	13	1.3	2	-	0	
	2SC5180 (NE68618)	3	0.01	15.5	1.5	2	-	0	
	2SC5015 (NE68518)	6	0.03	12	1.5	2	-	0	
	2SC5013 (NE68018)	10	0.035	10	1.8	2	-	0	
	2SC5012 (NE68118)	10	0.65	9	1.2	1	-	0	
	2SC5011 (NE85618)	12	0.1	6.5	1.1	1	-	0	
	2SC5704 (NE662M16)	3.3	0.035	25	1.1	2	-	0	
	2SC5369 (NE696M01)	6	0.03	14	1.3	2	-	0	
F4Pin TSMM	NE661M05	3.3	0.012	25	1.2	2	-	0	
	2SC5509 (NE663M04)	3.3	0.1	15	1.2	2	-	0	
	2SC5508 (NE662M04)	3.3	0.035	25	1.1	2	-	0	
	2SC5507 (NE661M04)	3.3	0.012	25	1.2	2	-	0	

Power MOSFETs for High Frequency Amplifier

■ RF MOSFETs for Radio Communication

Package	Part No.	Ratings		Characteristics					PAE typ (%)	Status
		V _{DSS} (V)	I _D (A)	P _{out} typ (dBm)	(W)	f (MHz)	P _{in} (mW)	V _{DD} (V)		
UPAK	RQA0004PXDQS	16	0.3	29.7	0.93	520	20	6	68	O♦
	RQA0005QXDQS	16	0.8	33	2	520	100	6	68	O♦
	RQA0010VXDQS	16	1.2	31.8	1.5	450	50	4.5	60	O♦
	RQA0008RXDQS	16	2.4	36	3.98	520	100	6	65	O♦
	RQA0009TXDQS	16	3.2	39	8	520	316	7	68	O♦
WSON 0504-2	RQA0011DNS	16	3.8	40.2	10.4	520	316	7.5	71	O♦
T-91M (3M)	NEM090603M-28	65	6	-	76	960	1349	-	-	0
	NEM090303M-28	65	8	-	45	960	630	-	-	0
T-97M (3P)	NEM091603P-28	65	12	-	160	880	3162	-	-	0
	NEM091203P-28	65	12	-	135	960	3162	-	-	0
	NEM090853P-28	65	10	-	89	960	1585	-	-	0
3pin PoMM	NE5500134	20	0.5	29.5	0.89	1900	100	4.8	55	0
	NE5500434	20	2	35	3.16	900	316	4.8	60	0
	NE5500234	20	1	32.5	1.78	1900	316	4.8	50	0
	NE5550234	30	0.6	33	2	460	31.6	7.5	68	0
79A	NE5550979A	30	1.7	39.5	8.91	460	316	7.5	66	0
	NE5531079A	30	3	40	10	460	316	7.5	68	0
	NE552R679A	15	0.6	28	0.63	460	31.6	3	60	0
	NE552R479A	15	0.6	26	0.4	2450	79	3	45	0
	NE5520379A	15	3	33	2	1785	316	3.2	35	0
	NE5520279A	15	0.6	32	1.58	1800	316	3.2	45	0
	NE5511279A	20	3	40	10	900	501	7.5	48	0
	NE5510279A	20	1	33	2	1800	316	4.8	47	0
	NE5500479A	20	1	31.5	1.41	900	100	3.5	62	0
	NE5500179A	20	0.5	30	1	1900	100	4.8	55	0
	NE5550779A	30	2.1	38.5	7.08	460	316	7.5	66	0
	NE5550279A	30	0.6	33	2	460	31.6	7.5	68	0
	16HTSSOP	NE55410GR	65	1	40	10	2140	40	28	-
T-101M (3S)	NEM091803S-28	65	10	-	170	880	3162	-	-	0

Notes) Production Status
 O: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date (Lead time: 3 months)
 Ordering Condition
 ♦: Large order only (Unit: Refer to packing unit (P.47 to 49))

Twin-type MOSFETs for High Frequency Amplifier

■ Twin Build in Biasing Circuit MOSFET IC for Tuner

Package	Part No.	Ratings			Characteristics (FET-1)				Characteristics (FET-2)				Status
		V _{DS} (V)	I _D (A)	C _{iss} (pF) typ	γ _{fsl} (mS) typ	NF (dB) typ	f (GHz)	C _{iss} (pF) typ	γ _{fsl} (mS) typ	NF (dB) typ	f (GHz)		
CMPAK-6	TBB1016	6	0.03	2.2	35	1	0.2	2.2	35	1	0.2	O◆	

Small Signal FETs for High Frequency Amplifier

■ Build in Biasing Circuit MOSFET IC for Tuner

Package	Part No.	Ratings			Characteristics				Status
		V _{DS} (V)	I _D (A)	C _{iss} (pF) typ	PG(dB) typ	NF (dB) typ	f (GHz)		
CMPAK-4	BB506C	6	0.03	1.6	-	1.4	0.9	O◆	

Junction Field Effect Transistor(J-FET)

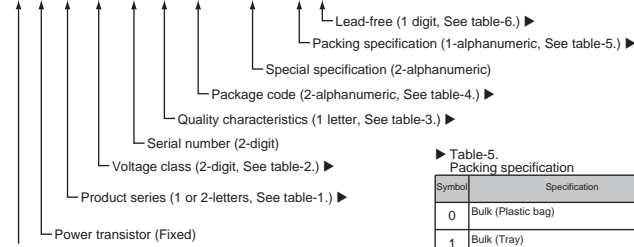
Package	Part No.	Ratings			Characteristics		Function	Status	Package	Part No.	Ratings			Characteristics		Function	Status
		V _{DSX} (V _{GS0}) (V)	I _D (mA)	P _T (mW)	I _{DSS} (μA)						V _{DSX} (V _{GS0}) (V)	I _D (mA)	P _T (mW)	I _{DSS} (μA)			
3pin TUSM	2SK3230C	20	10	100	min.	max.	General Purpose	O	MPAK	2SK1070	(-22)	50	150	12000	40000	High frequency amplifier	O◆

Notes) Production Status
 O: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date(Lead time: 3 months)
 Ordering Condition ◆: Large order only
 (Unit: Refer to packing unit (P.47 to 49))

Part No. Designation

Part No. Designation of Power TRS (Renesas)

R J K 04 01 J PE - 01 - J 4



Renesas's Semiconductors (Fixed)

▶ Table-1. Product series

Symbol	Productseries
E	MOS Pch w/ function
F	MOS Nch w/ function
G	MOS Pch and Nch w/ function
H	IGBT + Diode
J	Power MOS Pch
K	Power MOS Nch
L	Power MOS Nch (Built-in high speed diode)
M	Power MOS Pch and Nch
P	IGBT
Q	IGBT w/ function
U	Diode (SFD, etc.)

▶ Table-2. Voltage class

Symbol	Voltage (V)
01	10 to 19
02	20 to 29
03	30 to 39
:	:
99	990 to 999
1A	1000 to 1099
1B	1100 to 1199
1C	1200 to 1299
1D	1300 to 1399
1E	1400 to 1499
1F	1500 to 1599

▶ Table-3. Quality characteristics

Symbol	Quality characteristics
J	High reliability 1
P	High reliability 2
D	For industrial use, etc.
A	For consumer use
S	For special and custom use

▶ Table-6. Lead-free

Symbol	Lead-free
0	w/o Bi
1	w/ Bi
2	w/o Bi
3	w/ Bi
4	—
5	—

▶ Table-5. Packing specification

Symbol	Specification
0	Bulk (Plastic bag)
1	Bulk (Tray)
2	Bulk (Special case)
5	Radial taping (Reverse)
6	Radial taping (Forward)
H	Emboss taping (Left)
J	Emboss taping (Left) Large
K	Emboss taping (Left) Narrow pitch
L	Emboss taping (Left) Large, Narrow pitch
P	Emboss taping (Right)
Q	Emboss taping (Right) Large
R	Emboss taping (Right) Narrow pitch
S	Emboss taping (Right) Large, Narrow pitch
T	Tube
Z	Radial taping (TZ)
W	Wafer
X	Chip

▶ Table-4. Package code

Code	Package
JA	TO-92 (SC-43A)
JE	TO-92M (SC-51)
QS	UPAK (SC-62)
QM	CMFPAK-6
PA	WPAK
PB	LFPAK
PC	LFPAK-I
PD	DPAK-S (MP-3A)
PE	LDBPAK-S1 (TO-220S)
PF	LDBPAK-S2 (SOT-263)
PH	DPAK-L (MP-3)
PJ	LDBPAK-L (TO-220C)
PK	TO-3P
PL	TO-3PL
PM	TO-3PFM
PN	TO-220AB
PP	TO-220FN
PQ	TO-220F
PR	TO-220FM
PS	TO-220CFM
SA	TSOP-8
SP	SOP-8
SC	HSOP-20
NP	QFN
NS	VSON-8
WA	Wafer
WT	Chip

Part No. Designation of Power TRS (JEITA)

2SK 1890 - 01 TZ - E

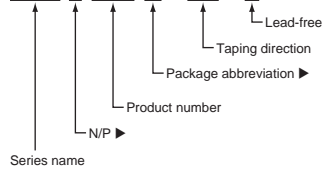


(1) Product number	Serial number from 11 or 1001 (JEITA registry number)
(2) Special specification	2 digits
(3) Taping direction	TR, TL, TZ, UL, UR (* Please refer to the Web-site.)
(4) Lead plating	-E (Lead-free), none (Leaded)
(5) JEITA name	2SC**** : High frequency use NPN bipolar transistor 2SD**** : Low frequency use NPN bipolar transistor 2SA**** : High frequency use PNP bipolar transistor 2SB**** : Low frequency use PNP bipolar transistor 2SK**** : Nch field-effect transistor (FET) 2SJ**** : Pch field-effect transistor (FET)

Part No. Designation of Power TRS (House)

■ HAT Series, Thermal FET Series

HAT 2 064 R - EL - E



▶ N/P

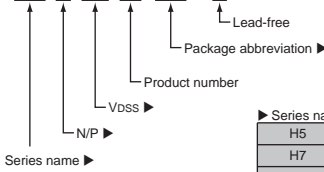
1	P ch
2	N ch
3	N ch/P ch

▶ Package abbreviation

H	LFPAK
N	LFPAK-I
T	TSSOP-8
R	SOP-8
RP	HSOP-11
M	TSOP-6
C	CMFPAK-6
G	CMPAK-6

■ H5N, H7N, H8N Series

H5 N 50 11 PL - E



▶ N/P

N	P ch
P	N ch

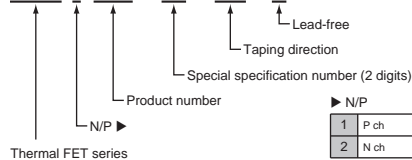
▶ Series name

Series name	Voltage Vdss = ×10
H5	
H7	50 500V
H8	02 20V

▶ Package abbreviation

PL	TO-3PL
P	TO-P
AB	TO-220AB
FM	TO-220FM
CFM	TO-220CFM
LD	LDBPAK-L
DL	DPAK-L(1), (2)
PF	TO-3PFM
LS/LM	LDBPAK-S(1)/S(2)
DS	DPAK-S

HAF 1 001 - 91 - TL - E



▶ N/P

1	P ch
2	N ch

Part No. Designation

JEITA Part No.

Single digit	S	1 digit alphabetic	2 to 4 digits	1 digit alphabetic
* a	* b	* c	* d	* e

* a: The number of effective electrodes -1

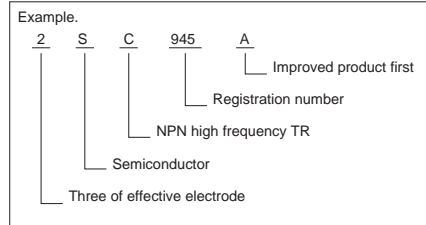
* b: Semiconductors (Semiconductor) show.

* c: Features of the device type

Symbol	Device type	Symbol	Device type
A	PNP high frequency TR	K	Nch FET
B	PNP low frequency TR		
C	NPN high frequency TR		
D	NPN low frequency TR		

* d: Registration number (11 -)

* e: Represents improvement. (And in alphabetical order.)



(1) Transistor with Internal Resistor

1 digit alphabetic	1 digit alphabetic + Single digit	1 digit alphabetic	Single digit	1 digit alphabetic	(1 to 2 digits or 1 digit alphabetic)	-	1 to 2 digit alphanumeric	-	Environmental
* a	* b	* c	* d	* e	* f		* g		* h

* a: Shows the outside.

* b: Indicate the polarity and electrical characteristics. Polarity with a letter, a number that represents the electrical characteristics. The meaning of letters is as follows.

Alphanumeric	A to M: NPN transistor	Alphanumeric	N to X: PNP Transistor	Alphanumeric	Y: NPN+PNP transistor
A1	Small signal type	N1	Small signal type	Y5	Small signal type
A2	Small signal high hFE type	N2	Small signal high hFE type		
A3	Small-signal with internal diode	N3	Small-signal with internal diode		
A4	Small-signal type (Flat chip shrink version)	N4	Small-signal type (Flat chip shrink version)		
A5	Small signal (Ic = 0.05A class)	N5	Small signal (Ic = 0.05A class)		
B1	Semi-power type 1 (Ic = 0.7A class)	P1	Semi-power type 1 (Ic = 0.7A class)		
C1	Semi-power type 2 (Ic = 2A class.)	Q1	Semi-power type 2 (Ic = 2A class.)		
C2	Semi-power type 3 (Ic = 3A class.)	Q2	Semi-power type 3 (Ic = 3A class.)		
D1	Semi-power type 4 (Ic = 1A class.)	R1	Semi-power type 4 (Ic = 1A class.)		
D2	Semi-power type 5 (ZeDi internal.)				
E1	Semi-power type 6 (High hFE)				
E2	Semi-power type 7 (High hFE, ZeDi internal.)				

* c: R1 significant figures of resistance. * d be used in conjunction with the index.

* d: R1 resistance index. The squares represent 10 n. N the number.

* e: R2/R1 ratio of the resistance. However, R1-free configurations * c, * d is that the value of the resistor R2.

* f: A section of special support. Serial number starting with # 1.

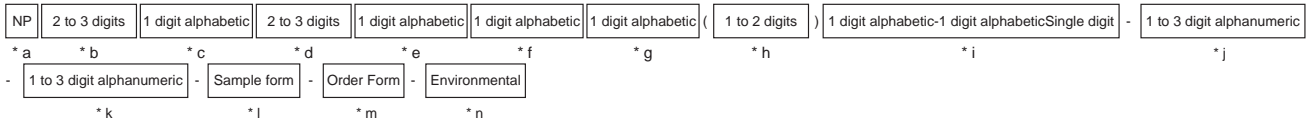
* g: Packing (view taping)

- ① Insert type T
- ② Surface mount

* h: Environmental

Part No. Designation

(2) Power MOSFET (NP Series)



* a: Indicate the Power MOSFET.

* b: Represents the $I_{D(OC)}$ rating. Example) 50: 50A rating, 110: 110A rating

* c: Represents the polarity. N: Nch P: Pch

* d: Represents the V_{OSS} rating. Example) 06: 60 V rating, 10: 100 V rating, 055: 55 V rating, 50: 500 V rating, 100: 1000 V rating

* e: Represents the package types.

Sign	Name	Sign	Name
A	TOP-3(MP-88)	K	TO-263AB(MP-25ZK)
B	TO-220 Isolated(MP-45F)	M	TO-220AB(MP25, JEDEC version.)
C	TO-220AB(MP25, JEITA version.)	N	TO-262AA(MP-25 fins cut, JEDEC version.)
D	TO-262AA(MP-25 fins cut, JEITA version.)	P	TO-263(MP-25ZP)
E	TO-220SMD(MP-25ZJ)	R	TO-251(JEDEC version.)
F	MP-10	S	TO-252(JEDEC version.)
G	TO-126	T	TO-263-7pin
H	TO-251(MP-3, JEITA version.)	V	TO-252(MP-3ZP)
I	TO-252(MP-3Z, JEITA version.)	Y	8pinHSO8
J	SOT-89(Power mini mold.)	Z	Wafer, Pellet

* f: Gate - represents the presence of protection diodes and voltage source drive.

- B: Built in Gate to Source protection diode drive voltage 2.5V
- L: Built in Gate to Source protection diode drive voltage 4, 4.5V
- H: Built in Gate to Source protection diode drive voltage 10V
- D: No protection diode between Gate and Source drive voltage 4, 4.5V
- U: No protection diode between Gate and Source drive voltage 10V

* g: Represents the series name.

- A: Generation 3 Series
- B: Generation 4 Series
- C: Generation 5 Series
- D: Generation 6 Series
- E: Generation 7 Series
- F: Generation 8 Series
- G: Generation 9 Series
- H: Generation 7 Series breaks
- J: Generation 10 Series

* h: Represents the special specification. Serial number starting with # 1.

* i: Represents the packing wafer or pellets.

- W-S Wafer (diced)
- W-U Wafer (no dicing)
- P-T Pellet (tray packed)
- P-S Pellet (Surt tape)
- Pellet (Embossed taping) is divided into the following chip in the direction of the tape pack.
- P-E1 Look left from the position of the gate pad tape drawer if you have an embossed carrier taping of which gate pad is faced to feed direction to reel direction.
- P-E2 Look right from the position of the gate pad tape drawer if you have an embossed carrier taping of which gate pad is faced to feed direction to reel direction.
- P-E3 In the case of a square chip which Gate pad is positioned middle of the side is face to reel direction.
- P-E4 In the case of a square chip which Gate pad is positioned middle of the side is face to feed direction.

* j: Product packing package

Numbers that begin with S: Stick Magazine

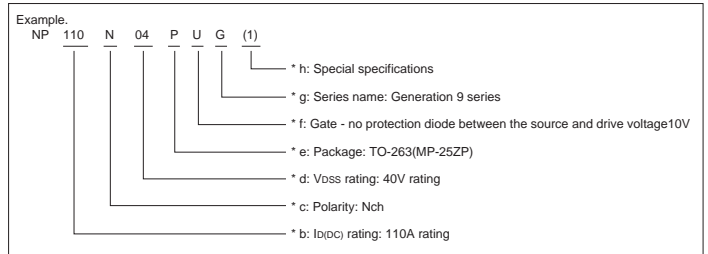
Surface mount

* k: OEM code

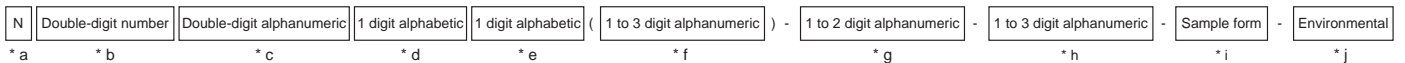
* l: Sample form

* m: Order form

* n: Environmental



(3) Transistor, MOSFET, J-FET (House)



* a: Indicate the Transistor, MOSFET or J-FET.

* b: Represents the voltage rating (V_{CE0} , V_{DSS}). 01 to 99 table of code.

Code	V_{CE0} / V_{DSS}	Code	V_{CE0} / V_{DSS}
01	10 to 19V	10	100 to 109V
02	20 to 29V	11	110 to 119V
03	30 to 39V	12	120 to 129V
04	40 to 49V	13	130 to 139V
05	50 to 59V
06	60 to 69V
07	70 to 79V	88	880 to 889V
08	80 to 89V	89	890 to 899V
09	90 to 99V	90	900V Over

* c: Part number. 00 to 99, A0 to ZZ
(a set sequential breakdown by voltage rating)

* d: Represents the polarity.

- R: PNP-Tr
- S: NPN-Tr
- N: Nch-FET
- P: Pch-FET

* e: Represents the improvement. (And in alphabetical order.)

* f: Represents the special specification. Serial number starting with # 1.

* g: Special specification Lead

- S: TO-262
- Z: TO-252, TO-220SMD
- ZJ: TO-263
- ZK: TO-252(MP-3ZK), TO-263AB
- ZP: TO-252(MP-3ZP), TO-263

* h: Packing (view taping)

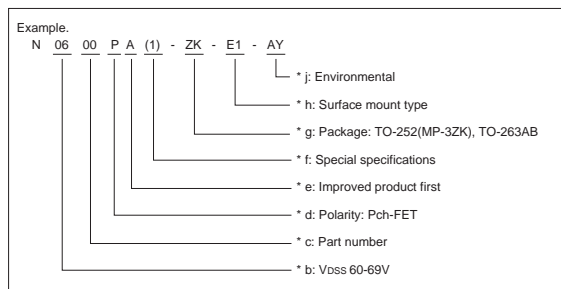
- Insert type T: Radial
- Numbers that begin with S: Stick magazine L: Stick magazine (magazine packed horizontal)
- VM: Magazine (magazine packed height)

Surface mount

* i: Sample form

* j: Environmental

Technical e to j can be omitted.



Part No. Designation

Structure of Part Numbers for High-Frequency Low-Noise Bipolar Transistors

■ 2SC/NE Series

Family Part No. — Form of Packing — Environmental Information

Family Part No.

Family Part No.	Ordering System	Target Area
2SCxxxx	JEITA Part No.	Japan, Asia
NExxxx□	House Part No.	Europe, Russia, and others

Example.

Catalog Part No.		2SC3356(NE85633)
Order Part No.	In cases where the order originated in Japan or another country in Asia	2SC3356-T1-A
	In cases where the order originated in Europe, Russia, or another area	NE85633-T1-A

Symbol for House Part No. on the Package

Symbol	Package	
	Name	Abbreviation
18	4-pin Super Mini mold	4SMM
19	3-pin Ultra Super Mini mold	3USMM
30	3-pin Super Mini mold	3SMM
33	3-pin Mini mold	3MM
34	3-pin Power Mini mold	3PMM
39	4-pin Mini mold	4MM
M01	6-pin Super Mini mold	6SMM
M02	4-pin Power Mini mold	4PMM
M04	Flat-Lead 4-pin Thin-Type Super Mini mold(M04)	F4TSMM(M04)
M05	Flat-Lead 4-pin Thin-Type Super Mini mold(M05)	F4TSMM(M05)
M13	3-pin Lead-Less Mini mold	3L2MM
M16	6-pin Lead-Less Mini mold(M16,1208PKG)	6L2MM(1208)
GR	16-pin plastic HTSSOP	16HTSSOP
79A	79A Mold Package	79A

Form of Packing

Symbol	Form of Packing
Blank	Individually packed device
T1	Tape reel (standard number of turns), perforation above the marking
T2	Tape reel (standard number of turns), marking above the perforation
T3	Tape reel (standard number of turns), direction of feed above the marking
T1B	Tape reel (large number of turns), perforation above the marking
T2B	Tape reel (large number of turns), marking above the perforation

Environmental Information

Symbol	Support for Lead-Free Requirements
A	Pb free(Totally lead free)
AZ	Pb free(Partially lead free)

Structure of Part Numbers for High-Frequency Power MOSFETs

■ NEM Series

NEMxxxx□—28

Symbol of Package

Symbol	Package
3M	T-91M
3P	T-97M
3S	T-101M

Power MOSFETs

■ Power MOSFETs for General Amplifier

Package	Part No.	Ratings			Characteristics			Status
		V _{DS} (V)	I _D (A)	lyfsl (S) typ	V _{DS(sat)} (Vds(on)) (V) max	Ciss (pF) typ		
TO-3P	2SK1056	120	7	1	12	600	O	
	2SK1057	140	7	1	12	600	O	
	2SK1058	160	7	1	12	600	O	
	2SK2220	180	8	1	12	600	O	
	2SK2221	200	8	1	12	600	O	

Package	Part No.	Ratings			Characteristics			Status
		V _{DS} (V)	I _D (A)	lyfsl (S) typ	V _{DS(sat)} (Vds(on)) (V) max	Ciss (pF) typ		
TO-3P	2SJ160	-120	-7	1	-12	900	O	
	2SJ161	-140	-7	1	-12	900	O	
	2SJ162	-160	-7	1	-12	900	O	
	2SJ351	-180	-8	1	-12	800	O	
	2SJ352	-200	-8	1	-12	800	O	

■ Power MOSFETs for Small Power

Package	Part No.	Polarity	Ratings		Characteristics			Status		
			V _{DSS} (V)	I _{D(DC)} (A)	QG (nC) typ.	R _{DS(on)} (mΩ) max.				
						10 V [8 V]	4 V [4.5 V]		2.5 V [1.8 V]	
3pin PoMM	2SJ179	P	-30	-1.5	-	1000	1500	-	O	
	2SJ197	P	-60	-1.5	-	1000	1500	-	O	
	2SJ199	P	-100	-1	-	2000	2500	-	O	
	2SJ206	P	-30	-0.5	-	3000	4000	-	O	
	2SJ208	P	-16	-2	-	-	1000	3000	O	
	2SJ213	P	-100	-0.5	-	4200	5000	-	O	
	2SJ355	P	-30	-2	12	350	600	-	O	
	2SJ356	P	-60	-2	12	500	950	-	O	
	2SK1273	N	60	2	-	650	1000	-	O	
	2SK1483	N	30	2	-	400	800	-	O	
	2SK1485	N	100	1	-	800	1200	-	O	
	2SK1584	N	30	0.5	-	1500	2000	-	O	
	2SK1588	N	16	3	-	-	300	500	O	
	2SK1592	N	60	0.5	-	2000	2500	-	O	
	2SK1593	N	100	0.5	-	5000	6000	-	O	
	2SK1960	N	16	3	-	-	200	300	O	
	2SK2109	N	60	0.5	-	800	1000	-	O	
	2SK2110	N	100	0.5	-	1200	1500	-	O	
	2SK2111	N	60	1	-	450	600	-	O	
	2SK2112	N	100	1	-	800	1200	-	O	
	2SK2159	N	60	2	-	-	300	500	O	
	2SK2857	N	60	4	11	150	220	-	O	
	2SK680A	N	30	1	-	700	1000	-	O	
	3pin TMM	2SJ621	P	-12	-3.5	6	-	[44]	62 [105]	O
		2SJ624	P	-20	-4.5	8	-	[54]	71 [108]	O
2SJ625		P	-20	-3	3	-	[113]	171 [314]	O	
2SJ557A		P	-30	-2.5	3.2	100	166 [134]	-	O	
N0300P		P	-30	-4.5	8.3	72	105 [105]	-	O	
2SJ626		P	-60	-1.5	8	388	556 [514]	-	O	
2SK3576		N	20	4	3	-	53 [50]	75	O	
2SK3577		N	30	3.5	3	-	65 [63]	91	O	
N0300N		N	30	4.5	7.4	50	83 [83]	-	O	
2SK3408		N	43	1	4	195	260 [250]	-	O	
2SK4035		N	250	0.5	4	4500	-	-	O	
N2500N		N	250	0.5	4.7	-	[5800]	6600	O	
5pin TMM		μPA508TE	N	20	2	3	-	57 [51]	90	O
		6LD3x3MLP	μPA2680T1E	N	20	3	3.1	50 [60]	-	O
6pin TMM		μPA2650T1E [D]	N	20	3.8	2.9	65	75 [39]	-	O
	μPA1901TE	N	30	6.5	6	-	40 [51]	54	O	
	μPA1902TE	N	30	7	8	22	30 [30]	-	O	
	μPA1911ATE	P	-20	-2.5	3	-	120 [115]	190	O	
	μPA1912TE	P	-12	-4.5	6	-	52 [50]	70	O	
	μPA1913TE	P	-20	-4.5	6	-	58 [55]	90	O	
	μPA1914TE	P	-30	-4.5	11	57	96 [86]	-	O	
	μPA1915TE	P	-20	-4.5	5	-	58 [55]	90	O	
	μPA1916TE	P	-12	-4.5	8	-	39 [39]	55 [98]	O	
	μPA1917TE	P	-20	-6	8	-	53 [53]	70 [107]	O	
	μPA1918TE	P	-60	-3.5	12	143	190 [179]	-	O	
	μPA1919TE	P	-20	-6	6	-	60 [58]	84	O	
	μPA1930TE	P	-30	-4.5	7	77	100 [100]	-	O	
	μPA1931TE	P	-40	-4.5	-20	44	53 [53]	-	O	
	μPA1932TE	N	-30	-6	20	38	59 [59]	-	O	
	μPA1950TE [D]	P	-12	-2.5	2	-	[130]	205 [375]	O	
	μPA1951TE [D]	P	-12	-2.5	2	-	[88]	133 [234]	O	
	μPA1952TE [D]	P	-20	-2	2	-	[135]	183 [284]	O	

Package	Part No.	Polarity	Ratings		Characteristics			Status		
			V _{DSS} (V)	I _{D(DC)} (A)	QG (nC) typ.	R _{DS(on)} (mΩ) max.				
						10 V [8 V]	4 V [4.5 V]		2.5 V [1.8 V]	
6pin TMM	μPA1970TE [D]	N	20	2.2	2	-	72 [69]	107	O	
	μPA1980TE	P	-20	-2	2	-	[135]	183 [284]	O	
	μPA1981TE	N/P	7	2.8	-	0	0 [70]	105 [0]	O	
	μPA621TT	N	20	5	3	-	53 [50]	79	O	
	μPA622TT	N	30	3	4	82	139 [120]	-	O	
6pin WSOF	μPA650TT	P	-12	-5	6	-	[50]	68 [114]	O	
	μPA651TT	P	-20	-5	6	-	[69]	88 [142]	O	
	MP-2	2SJ358	P	-60	-3	24	300	400	-	O
MP-2	2SJ462	P	-12	-2.5	12	-	190	290	O	
	2SK2053	N	16	5	-	-	120	150	O	
	2SK2054	N	60	3	-	200	250	-	O	
	2SK2055	N	100	2	-	350	450	-	O	
	3pin MM	2SJ185	P	-50	-0.1	-	-	20000	40000	O
2SJ203		P	-16	-0.2	-	-	10000	23000	O	
2SJ204		P	-30	-0.2	-	8000	13000	-	O	
2SJ209		P	-100	-0.1	-	60000	100000	-	O	
2SJ210		P	-60	-0.2	-	10000	15000	-	O	
2SJ211		P	-100	-0.2	-	20000	30000	-	O	
2SJ461		P	-50	-0.1	-	-	50000	100000	O	
2SK1133		N	50	0.1	-	-	50000	-	O	
2SK1399		N	50	0.1	-	-	20000	40000	O	
2SK1581		N	16	0.2	-	-	3000	5000	O	
2SK1582		N	30	0.2	-	3000	[5000]	-	O	
2SK1589		N	100	0.1	-	30000	[25000]	-	O	
2SK1590		N	60	0.2	-	3000	6000	-	O	
2SK1591		N	100	0.2	-	6500	8000	-	O	
2SK1657		N	30	0.1	-	-	25000	45000	O	
2SK2158	N	50	0.1	-	-	15000	20000	O		
QN7002	N	60	0.2	2	2700	[3200]	-	O		
3pin SSP	2SJ463A	P	-30	-0.1	-	13000	23000	60000	O	
	2SJ647	P	-20	-0.4	-	-	1550 [1450]	2980	O	
	2SK1580	N	16	1	-	-	10000	15000	O	
	2SK1658	N	30	0.1	-	-	25000	45000	O	
	2SK1958	N	16	0.1	-	-	12000	15000	O	
3pin USM	2SK2090	N	50	0.1	-	-	20000	40000	O	
	2SK2858	N	30	0.1	-	-	5000	8000	O	
	2SK3663	N	20	0.5	-	-	600 [570]	880	O	
	2SK3749	N	50	0.1	-	-	[20]	40	O	
	2SJ243	P	-30	-0.1	-	-	25000	100000	O	
5pin MM	2SJ559	P	-30	-0.1	-	13000	23000	60000	O	
	2SJ648	P	-20	-0.4	-	-	1550 [1450]	2980	O	
	2SK1824	N	30	0.1	-	-	8000	13000	O	
	2SK3107	N	30	0.1	-	5000	8000	15000	O	
	2SK3503	N	16	0.1	-	-	12000	15000	O	
5pin SSP	2SK3664	N	20	0.5	-	-	600 [570]	880	O	
	μPA502T [D]	N	50	0.1	-	25000	30000	-	O	
	μPA503T [D]	P	-50	-0.1	-	60000	100000	-	O	
	μPA572T [D]	N	30	0.1	-	-	8000	13000	O	
	μPA573T [D]	P	-30	-0.1	-	-	25000	100000	O	
6pin MM	μPA602T [D]	N	50	0.1	-	25000	30000	25000	O	
	μPA606T [D]	N	50	0.1	-	25000	30000	-	O	
	μPA611TA [D]	N	30	0.1	-	8000	15000	-	O	
	μPA672T [D]	N	50	0.1	-	-	20000	40000	O	
	μPA677TB [D]	N	20	0.35	-	-	600 [570]	880	O	
6pin SSP	μPA678TB [D]	P	-20	-0.25	-	-	1550 [1450]	2980	O	
	μPA679TB [D]	N/P	20	0.35	-	-	600 [570]	880	O	
	MP-3ZK	N0400P	P	-40	-15	16	-	[40]	73	O
	SOT-23F	N0100P	P	-12	-3.5	8.3	-	[44]	[105]	O
	N0301P	P	-30	-4	9.5	-	[75]	106	O	
N0302P	P	-30	-4.4	14	54	[150]	-	O		
N0301N	N	30	4.5	10	36	130	-	O		

Power MOSFETs

Power MOSFETs for Small Signal

Package	Part No.	Polarity	Ratings		Characteristics			Status	
			V _{DSS} (V)	I _{D(DC)} (A)	QG (nC) typ.	R _{DS(on)} (mΩ) max.			
						10 V [8 V]	4 V [4.5 V]		2.5 V [1.8 V]
3pin TMM	2SJ557A	P	-30	-2.5	3.2	100	166 [134]	-	O
	N3000N	N	30	4.5	7.4	50	[83]	-	O
	N3000P	P	-30	-4.5	8.3	72	[105]	-	O
	N2500N	N	250	0.5	4.7	-	[5800]	6600	O

Package	Part No.	Polarity	Ratings		Characteristics			Status	
			V _{DSS} (V)	I _{D(DC)} (A)	QG (nC) typ.	R _{DS(on)} (mΩ) max.			
						10 V [8 V]	4 V [4.5 V]		2.5 V [1.8 V]
6LD3x3MLP	μPA2680T1E	N	20	3	3.1	50	[60]	-	O

Power MOSFETs for Protection use of Cellular Phone Battery

Package	Part No.	Polarity	Ratings		Characteristics			Status	
			V _{DSS} (V)	I _{D(DC)} (A)	QG (nC) typ.	R _{DS(on)} (mΩ) max.			
						10 V [8 V]	4 V [4.5 V]		2.5 V [1.8 V]
4pin EFLIP	μPA2350BT1G [D]	N	20	6	6.2	-	37 [35]	55	O
	μPA2351T1G [D]	N	30	5.7	7	-	42 [40]	64	O
	μPA2352BT1G [D]	N	24	4	5	-	45 [43]	67	O
	μPA2353T1G [D]	N	20	6	8	-	31	43	O
	μPA2354T1G [D]	N	24	4	6	-	[42]	57	O
	μPA2371T1P	N	24	6	26.5	-	20	39.5	O
	μPA2373T1P	N	24	6	22	-	24	42	O
	μPA2375T1P	N	24	10	40	-	11.4	23	O
	μPA2379T1P	N	12	8	20	-	11.9	26	O
	μPA2350BT1P [D]	N	20	6	6.2	-	37 [35]	55	O
4pin EFLIP-LGA	μPA2351BT1P [D]	N	30	5.7	6.5	-	40	64	O
	μPA2352BT1P [D]	N	24	4	5	-	43	67	O
	μPA2353T1P [D]	N	20	6	8	-	[31]	[79]	O
	μPA2354T1P [D]	N	24	4	6	-	45 [42]	57 [99]	O
6pin HWSON	μPA2450CTL [D]	N	20	8.6	6	-	18.5 [17.5]	27.5	O
	μPA2451CTL [D]	N	30	8.2	6.3	-	[21]	32	O
	μPA2452TL [D]	N	24	7.8	7	-	22.5 [21.5]	30	O

Package	Part No.	Polarity	Ratings		Characteristics			Status	
			V _{DSS} (V)	I _{D(DC)} (A)	QG (nC) typ.	R _{DS(on)} (mΩ) max.			
						10 V [8 V]	4 V [4.5 V]		2.5 V [1.8 V]
6pin HWSON	μPA2454TL [D]	N	24	15	11.5	-	10 [10.5]	15.5	O
	μPA2455TL [D]	N	30	15	12	-	12 [13]	18	O
8pin TSSOP (TSSOP-8)	μPA1870BGR [D]	N	20	6	10	-	21 [20]	27	O
	μPA1871GR [D]	N	30	6	9	0.026	27 [26]	38	O
	μPA1872BGR [D]	N	20	10	15	-	13.5 [13]	18	O
	μPA1873GR [D]	N	20	6	9	-	24 [23]	29	O
8pin HUSON -2027	μPA1874BGR [D]	N	30	8	14	-	14.5 [14]	19.5	O
	μPA2460T1Q	N	20	6.5	8	-	18.5 [17.5]	27.5	O
8pin HUSON -2027	μPA2461T1Q	N	30	6.5	7.5	-	22 [21.5]	32	O
	μPA2462T1Q	N	24	6	7	-	22.5 [21.5]	30	O
	μPA2463T1Q	N	20	6	7	-	21 [20]	28.5	O
	μPA2464T1Q	N	30	6	7	-	27 [26]	38	O
	μPA2465T1Q	N	20	6.5	8	-	17 [16.5]	24.5	O

Power MOSFETs for Protection use of PC and Battery

Package	Part No.	Ratings		Characteristics			Status	
		V _{DSS} (V)	I _D (A)	QG (nC) typ.	R _{DS(on)} (Ω) max.			Ciss (pF) typ.
					10 V [8 V]	4 V [4.5 V]		
FP-8DA (JEDEC) (SOP-8)	RJK0362DSP	30	16	-	0.0065	0.0099(5V)	2700	O♦
	RJK0358DSP	30	20	-	0.0042	0.0062(5V)	4300	O♦

Package	Part No.	Ratings		Characteristics			Status	
		V _{DSS} (V)	I _D (A)	QG (nC) typ.	R _{DS(on)} (Ω) max.			Ciss (pF) typ.
					10 V [8 V]	4 V [4.5 V]		
LPAK	HAT1127H	-30	-40	-	0.0045	[0.0077]	5600	O♦
	HAT1125H	-30	-45	-	0.0036	[0.0059]	7000	O♦
WPAK	RJK0358DPA	30	38	-	0.0034	0.0054(5V)	4300	O♦

Thermal Shut Down Functioned MOSFET

Package	Part No.	Ratings		Characteristics			Status
		V _{DSS} (V)	I _D (A)	R _{DS(on)} (Ω) max.		T _{SD} (°C) typ.	
				V _{GS} 10 V	V _{GS}		
FP-8DA Dual (JEDEC) (SOP-8)	HAF2026RJ [D]	60	0.6	0.21	0.3 (5V)	175	O
	RJF0609JSP [D]	60	1.5	0.263	0.35 (4V)	175	SPL
	RJF0610JSP [D]	60	1.5	0.214	0.285 (4V)	175	O
	RJE0607JSP [D]	-60	-1.5	0.26	0.38 (-6V)	175	O
FP-8DA (JEDEC) (SOP-8)	HAF2015RJ	60	2	0.16	0.2 (4V)	175	O
	RJF0608JSP	60	5	0.075	0.1 (4V)	175	SPL
	RJF0613JSP	60	10	0.03	0.04 (4V)	175	SPL
	RJE0616JSP	-60	-4	0.09	0.15 (-6V)	175	O
DPAK(L)-(2)	HAF1010RJ	-60	-5	0.2	0.34 (-4V)	175	O
	RJE0615JSP	-60	-10	0.065	0.095 (-6V)	175	O
	HAF2007L	60	5	0.075	0.12 (4V)	175	O
	HAF2025L	60	15	0.045	0.06 (5V)	175	O
DPAK(S)	HAF1004L	-60	-5	0.2	0.34 (-4V)	175	O
	HAF2007S	60	5	0.075	0.12 (4V)	175	O
	RJF0604JPD	60	5	0.075	0.1 (4V)	175	SPL
	RJF0604DPD	60	5	0.075	0.1 (4V)	175	SPL
LPAK(L)	HAF2025S	60	15	0.045	0.06 (5V)	175	O
	RJF0605JPD	60	20	0.038	0.05 (4V)	175	SPL
	RJF0605DPD	60	20	0.038	0.05 (4V)	175	SPL
	RJF0611JPD	60	30	0.03	0.04 (4V)	175	SPL
	RJF0611DPD	60	30	0.03	0.04 (4V)	175	SPL
	RJE0609JPD	-60	-5	0.1	0.170 (-6V)	175	O
	HAF1004S	-60	-5	0.2	0.34 (-4V)	175	O
	RJE0605JPD	-60	-10	0.075	0.11 (-6V)	175	O
	HAF2012L	60	20	0.043	0.065 (4V)	175	O
	HAF2017L	60	20	0.043	0.053 (4.5V)	175	O
	HAF2011L	60	40	0.02	0.033 (4V)	175	O
	HAF2021L	60	50	0.012	0.015 (6V)	175	O
LPAK(S)-(1)	HAF2027L	60	50	0.01	0.015 (4V)	175	O
	HAF1002L	-60	-15	0.09	0.13 (-4V)	175	O
	HAF1008L	-60	-20	0.054	0.08 (-4V)	175	O
	HAF1009L	-60	-40	0.027	0.05 (-4V)	175	O
	HAF2017S	60	20	0.043	0.053 (4.5V)	175	O
	HAF2012S	60	20	0.043	0.065 (4V)	175	O
	HAF2019S	60	20	0.043	0.065 (4V)	175	O
	RJF0611JPE	60	30	0.03	0.04 (4V)	175	O
	RJF0611DPE	60	30	0.03	0.04 (4V)	175	O
	HAF2011S	60	40	0.02	0.033 (4V)	175	O
	RJF0606JPE	60	40	0.019	0.025 (4V)	175	O
	RJF0606DPE	60	40	0.019	0.025 (4V)	175	O
HAF2021S	60	50	0.012	0.015 (6V)	175	O	
HAF2027S	60	50	0.01	0.015 (4V)	175	O	
RJF0612DPE	60	50	0.0075	0.01 (4V)	175	SPL	
RJF0612JPE	60	50	0.0075	0.01 (4V)	175	SPL	
HAF1008S	-60	-20	0.054	0.08 (-4V)	175	O	
HAF1009S	-60	-40	0.027	0.05 (-4V)	175	O	
RJE0601JPE	-60	-40	0.027	0.045 (-6V)	175	O	
RJE0603JPE	-60	-50	0.015	0.03 (-6V)	175	O	
TO-220FM	HAF2002	60	20	0.043	0.065 (4V)	175	O
	HAF2005	60	40	0.02	0.033 (4V)	175	O
HSOP36	RJ25953SP	16	50	Pch/Nch: 16m/11m	-	175	O

Driver IC - MOSFET Integrated SiP (DrMOS)

Package	Part No.	Vin (V)	Vout (V)	Iout Max. (A)	f Max. (kHz)	Status
QFN-40	R2J20651ANP	Up to 16	0.8 to 3.3	35	2000	O
	R2J20651NP	Up to 16	0.8 to 3.3	35	2000	O
	R2J20654NP	Up to 20	0.8 to 3.3	40	2000	O
	R2J20657BNP	Up to 20	0.8 to 3.3	40	2000	O
	R2J20657NP	Up to 20	0.8 to 3.3	40	2000	O
	R2J20658BNP	Up to 20	0.8 to 3.3	40	2000	O
	R2J20658NP	Up to 20	0.8 to 3.3	40	2000	O
	R2J20652ANP	Up to 27	0.8 to 3.3	35	2000	O
	R2J20653ANP	Up to 27	0.8 to 3.3	35	2000	O
	R2J20655BNP	Up to 27	0.8 to 3.3	35	2000	O
QFN-56	R2J20655NP	Up to 27	0.8 to 3.3	35	2000	O
	R2J20656ANP	Up to 27	0.8 to 3.3	35	2000	O
	R2J20602NP	Up to 16	0.8 to 3.3	40	2000	O
	R2J20604NP	Up to 16	0.8 to 3.3	40	2000	O
	R2J20605ANP	Up to 27	0.8 to 3.3	40	2000	O

PWM Controller - MOSFET Integrated SiP (POL-SiP)

Package	Part No.	Vin (V)	Vout (V)	Iout Max. (A)	f Max. (kHz)	Status
QFN-40	R2J20751NP	Up to 27	0.6 to 3.3	25	1000	O
QFN-56	R2J20702NP	Up to 16	0.6 to 3.3	40	1000	O

Power MOSFETs for Automobile use

Package	Part No.	Ratings		Characteristics		Ciss (pF) typ.	Status
		V _{DSS} (V)	I _D (A)	R _{DS(on)} (Ω) max.			
				4 V [4.5 V]	10 V [8 V]		
TO-3P	RJK2062JPK	200	80	0.022	-	6800	SPL♦
	RJK0323JPD	30	30	0.009	[0.013]	2600	O♦
DPAK(S)	RJK0632JPD	60	20	0.035	[0.055]	440	Δ♦
	RJK0636JPD	60	25	0.022	[0.034]	750	Δ♦
	RJK0631JPD	60	30	0.015	[0.02]	1350	O♦
LPAK(S)-(1)	RJK0406JPE	40	160	0.002	-	6300	O♦
	RJK0631JPE	60	30	0.015	[0.02]	1350	Δ♦
	RJK0630JPE	60	75	0.0075	[0.011]	2100	Δ♦
	RJK0629JPE	60	85	0.0045	[0.0068]	4100	O♦
HSOP-20	RJK0628JPE	60	160	0.0032	[0.0049]	5400	Δ♦
	RJK2061JPE	200	40	0.075	-	2100	SPL♦
	RJM0404JSC	40/-40	20/-20	0.021/0.042	[0.032/0.068]	1400/1500	O♦
	RJM0603JSC	60/-60	20/-2				

IGBT

IGBTs for Strobe use

Package	Part No.	Ratings			Status
		V _{CES} (V)	I _{CM} (A)	Gate Drive (V)	
TO-220FL	RJP4301APP-M0	430	200	26	O
	RJP5001APP-M0	500	300	12	O
FP-8DA JEDEC: SOP-8	CY20AAJ-8H	400	130	4	O◆

Package	Part No.	Ratings			Status
		V _{CES} (V)	I _{CM} (A)	Gate Drive (V)	
TSOJ-8	RJP4010AGE	400	150	3	O◆
VSON-8	RJP4009ANS	400	150	2.5	O◆

Note) As for the IGBT Driver IC for the strobe flashers, refer to the " Multi-Purpose ASSP " section of the Renesas Strobe Circuit Devices and the Renesas General-Purpose ICs Status List.

Fast Recovery Diodes

Application	Package	Part No.	Ratings				Characteristics		Status	
			V _R [V _{RRM}] (V)	I _R (μA) max.	I _F (A)	I _{FSM} (A)	T _j (°C)	V _F (V) max.		t _{rr} (ns) typ.
Fast Recovery	LDBAK(S)-(1)	★ RJU3051SDPE	360	1	10	50	150	1.7	25	O
		★ RJU4351SDPE	430	1	10	50	150	1.9	25	O
		★ RJU4352SDPE	430	1	30	100	150	1.8	25	O
		RJU6052SDPE	600	1	10	30	150	3	25	O◆
		RJU6053SDPE	600	1	20	60	150	3	25	O◆
		RJU6054SDPE	600	1	30	120	150	3	25	O◆
	TO-220FP	RJU60C6SDPE	600	1	50	140	150	2	100	SPL
		RJU4351TDPP-EJ	430	1	10	50	150	1.9	25	O
		RJU4352TDPP-EJ	430	1	20	100	150	1.8	25	O
		RJU6052TDPP-EJ	600	1	10	30	150	3	25	O
		RJU6053TDPP-EJ	600	1	20	60	150	3	25	O
		RJU6054TDPP-EJ	600	1	30	120	150	3	25	O
		★ RJU60B4TDPP-EJ	600	1	30	120	150	2	40	SPL
		RJU60C2TDPP-EJ	600	1	15	60	150	2	70	O
		RJU60C3TDPP-EJ	600	1	30	80	150	2.1	90	O
		RJU60C6TDPP-EJ	600	1	50	140	150	2	100	O
	TO-220FL	★ RJU6053WDPP-M0	600	1	20	60	150	3	25	SPL
		★ RJU60C3WDPP-M0	600	1	30	80	150	2.1	90	O
	TO-252	★ RJU3052SDPD-E0	360	1	20	80	150	1.7	25	O
		★ RJU4352SDPD-E0	430	1	20	80	150	1.8	25	O
		RJU6052SDPD-E0	600	1	10	30	150	3	25	O◆
		RJU60C2SDPD-E0	600	1	15	60	150	2	70	O◆
	TO-3PSG	RJU60C3SDPD-E0	600	1	30	80	150	2.1	90	O◆
		★ RJU36B1WDPK-M0	360	1	20	80	150	1.5	40	O
		★ RJU36B2WDPK-M0	360	1	40	160	150	1.5	40	O
		★ RJU6053WDPK-M0	600	1	20	60	150	3	25	O
		RJU6054SDPK-M0	600	1	30	120	150	3	25	O
		★ RJU6054WDPK-M0	600	1	30	120	150	3	25	O
		★ RJU60C3WDPK-M0	600	1	30	80	150	2.1	90	SPL
		RJU60C6SDPK-M0	600	1	50	140	150	2	100	SPL
★ RJU60C6WDPK-M0	600	1	50	140	150	2	100	SPL		

SiC SBD

Application	Package	Part No.	Ratings				Characteristics		Status	
			V _R [V _{RRM}] (V)	I _R (μA) max.	I _F (A)	I _{FSM} (A)	T _j (°C)	V _F (V) max.		t _{rr} (ns) typ.
Silicon Carbide Schottky Barrier Diodes	TO-220FP	★ RJS6004TDPP-EJ	600	1	10	60	150	1.8	15	SPL
		★ RJS6005TDPP-EJ	600	1	15	90	150	1.8	15	SPL
	TO-220AB	★ RJS6004TDPN-EJ	600	1	10	60	150	1.8	15	SPL
		★ RJS6005TDPN-EJ	600	1	15	90	150	1.8	15	SPL
	TO-3P	★ RJS6004WDPK-00	600	1	10	60	150	1.8	15	O
		★ RJS6005WDPK-00	600	1	15	90	150	1.8	15	SPL

Compound Power Devices

Package	Part No.	Ratings				Characteristics						Status
		Diode		Transistor		Diode			Transistor			
		V _{RM} (V)	I _F (A)	V _{CES} (V)	I _b (A) I _c (A)	Type	V _F (V) typ	T _{rr} (μs) typ	Type	R _{ON} (Ω) V _{CE} (sat) (V) typ		
TO-3PFM-5	★ RJQ6003DPM	600	20	600	40	Si-FRD	1.4	0.1	IGBT	1.37V	SPL	
	★ RJQ6008DPM	600	20	600	25	Si-FRD	1.2	0.1	IGBT	2.65V	O	
	★ RJQ6015DPM	600	20	600	37	Si-FRD	1.4	0.1	IGBT	1.60V	SPL	
	★ RJQ6020DPM	600	20	600	20	SiC-SBD	1.5	0.015	SJ-MOS	0.10Ω	SPL	
	★ RJQ6021DPM	600	20	600	20	SiC-SBD	1.5	0.015	IGBT	1.50V	SPL	
	★ RJQ6022DPM	600	20	600	20	SiC-SBD	1.5	0.015	IGBT	1.40V	SPL	

Notes) Production Status
 O: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date (Lead time: 3 months)
 Ordering Condition
 ◆: Large order only (Unit: Refer to packing unit (P.47 to 49))
 ★: New product

Triacs

Package	Part No.	Ratings					Characteristics		Status
		T _J (°C)	V _{DRM} (V)	T _C (°C)	I _T (RMS) (A)	I _{TSM} (A)	I _{GT} (max) (mA)		
TO-92	BCR08AM-12A	125	600	56	0.8	8	(I,II,III)5	O	
	BCR08AM-14A	125	700	60	0.8	8	(I,II,III)5	O	
	BCR1AM-12A	125	600	56	1	10	(I,II,III)7	O	
	BCR1AM-8P	125	400	56	1	10	(I,II,III)5 (IV)10	O	
	BCR1BM-16A	125	800	49	1	8	(I,II,III)10	O	
	BCR3AM-14B	125	800	87	3	30	(I,II,III)30	O	
		150	700						
UPAK	BCR08AS-12A	125	600	40	0.8	8	(I,II,III)5 (IV)10	O	
	BCR08AS-14A	125	700	40	0.8	8	(I,II,III)5	O	
MP-3A	BCR08ES-14A	125	700	40	0.8	8	(I,II,III)5	O	
	BCR2AS-14A	125	700	-	2	10	(II,III)10	O	
	BCR3AS-12A	125	600	108	3	30	(I,II,III)15	O	
	BCR3AS-12B	150	600	133	3	30	(I,II,III)15	O	
	BCR3AS-14B	125	800	133	3	30	(I,II,III)30	O	
		150	700						
	BCR4AS-16LH	150	800	129	4	40	(I,II,III)35	O	
	BCR5AS-12A	125	600	103	5	50	(I,II,III)30	O	
	BCR5AS-12B	150	600	128	5	50	(I,II,III)30	O	
	BCR5AS-14A	125	700	103	5	50	(I,II,III)30	O	
	BCR5AS-14LJ	150	700	128	5	50	(I,II,III)30	O	
	BCR8AS-14LJ	125	700	97	8	80	(I,II,III)30	O	
	MP-5	BCR2EM-14LB	125	800	138	2	8	(I,II,III)10	O
			150	700					
TO-220	BCR4CM-16LH	150	800	132	4	40	(I,II,III)35	B	
	BCR5AM-12LA	125	600	103	5	50	(I,II,III)20	B	
	BCR5AM-12LB	150	600	128	5	50	(I,II,III)20	B	
	BCR6AM-12LA	125	600	103	6	60	(I,II,III)30	B	
	BCR6AM-12LB	150	600	128	6	60	(I,II,III)30	B	
	BCR8CM-12LA	125	600	105	8	80	(I,II,III)30	B	
	BCR8CM-12LB	150	600	130	8	80	(I,II,III)30	B	
	BCR8CM-14LK	125	800	130	8	80	(II,III)12	B	
		150	700						
	BCR10CM-12LA	125	600	103	10	100	(I,II,III)30	B	
	BCR10CM-12LB	150	600	128	10	100	(I,II,III)30	B	
	BCR10CM-16LH	150	800	128	10	100	(I,II,III)50	B	
	BCR12CM-12LA	125	600	98	12	120	(I,II,III)30	B	
	BCR12CM-12LB	150	600	123	12	120	(I,II,III)30	B	
	BCR12CM-14LK	125	800	123	12	120	(II,III)12	B	
		150	700						
	BCR12CM-16LB	150	800	123	12	120	(I,II,III)30	B	
	BCR12CM-16LH	150	800	123	12	120	(I,II,III)50	B	
	BCR16CM-12LA	125	600	100	16	170	(I,II,III)30	B	
	BCR16CM-12LB	150	600	118	16	160	(I,II,III)30	B	
	BCR16CM-12LC	150	600	110	16	96	(I,II,III)50	B	
	BCR16CM-14LK	125	800	125	16	160	(II,III)12	B	
		150	700						
	BCR16CM-16LB	150	800	118	16	160	(I,II,III)30	B	
	BCR16CM-16LH	150	800	125	16	170	(I,II,III)50	B	
	BCR20AM-12LA	125	600	109	20	200	(I,II,III)30	B	
	BCR20AM-12LB	150	600	134	20	200	(I,II,III)30	B	
	BCR20CM-14LK	125	800	134	20	200	(II,III)12	B	
		150	700						
	BCR20CM-16LB	150	800	134	20	200	(I,II,III)30	B	
	TO-220AB (TO-220ABS)	BCR4CM-16LH	150	800	132	4	40	(I,II,III)35	O
		BCR5CM-12LB	150	600	128	5	50	(I,II,III)20	O
		BCR5CM-12RA	150	600	108	5	50	(I,II,III)15	O
		BCR6CM-12LB	150	600	128	6	60	(I,II,III)30	O
		BCR6CM-12RA	150	600	103	6	60	(I,II,III)20	O
		BCR8CM-12LB	150	600	130	8	80	(I,II,III)30	O
		BCR8CM-14LK	125	800	130	8	80	(II,III)12	O
			150	700					
		BCR10CM-12LB	150	600	128	10	100	(I,II,III)30	O
		BCR10CM-16LH	150	800	128	10	100	(I,II,III)50	O
		BCR12CM-12LB	150	600	123	12	120	(I,II,III)30	O
		BCR12CM-14LK	125	800	123	12	120	(II,III)12	SPL
		150	700						
BCR12CM-16LB		150	800	123	12	120	(I,II,III)30	O	
BCR12CM-16LH		150	800	123	12	120	(I,II,III)50	O	
BCR16CM-12LB		150	600	118	16	160	(I,II,III)30	O	
BCR16CM-12LC		150	600	110	16	96	(I,II,III)50	O	
BCR16CM-14LK		125	800	125	16	160	(II,III)12	SPL	
	150	700							
BCR16CM-16LB	150	800	118	16	160	(I,II,III)30	O		
BCR16CM-16LH	150	800	125	16	170	(I,II,III)50	O		
BCR20CM-12LB	150	600	134	20	200	(I,II,III)30	O		
BCR20CM-14LK	125	800	134	20	200	(II,III)12	SPL		
	150	700							
BCR20CM-16LB	150	800	122	20	200	(I,II,III)30	O		
BCR25CM-12LB	150	600	132	25	250	(I,II,III)50	O		
BCR30CM-8LB	150	400	121	30	300	(I,II,III)30	O		
TO-220F(2)	BCR2PM-12RE	150	600	20	2	10	(II,III)10	O	
	BCR2PM-14LE	125	800	20	2	10	(I,II,III)10	O	
		150	700						
	BCR8PM-12LE	125	600	88	8	80	(I,II,III)30	O	
BCR8PM-14LE	125	700	88	8	80	(I,II,III)30	O		
BCR12PM-12LC	150	600	87	12	72	(I,II,III)50	O		
BCR16PM-12LC	150	600	73	16	96	(I,II,III)50	O		
TO-220F	BCR3PM-12LA	125	600	107	3	30	(I,II,III)20	O	
	BCR3PM-12LB	150	600	132	3	30	(I,II,III)20	O	
	BCR3PM-12LG	150	600	130	3	30	(I,II,III)20	O	
	BCR3PM-14LG	125	800	130	3	30	(I,II,III)30	O	
		150	700						
	BCR5PM-12LA	125	600	95	5	50	(I,II,III)20	O	
	BCR5PM-12LB	150	600	120	5	50	(I,II,III)20	O	
	BCR5PM-12LG	150	600	113	5	50	(I,II,III)20	O	
	BCR5PM-14LA	125	700	95	5	50	(I,II,III)30	O	
	BCR5PM-14LD	150	700	107	5	30	(I,II,III)50	O	
	BCR5PM-14LG	125	800	113	5	50	(I,II,III)30	O	
		150	700						
	BCR5PM-14LJ	150	700	113	5	50	(I,II,III)30	O	
	BCR8PM-12LA	125	600	88	8	80	(I,II,III)30	O	
BCR8PM-12LB	150	600	113	8	80	(I,II,III)30	O		
BCR8PM-12LD	150	600	85	8	48	(I,II,III)50	O		
BCR8PM-12LG	150	600	107	8	80	(I,II,III)30	O		
BCR8PM-14LA	125	700	88	8	80	(I,II,III)30	O		
BCR8PM-14LD	150	700	85	8	48	(I,II,III)50	O		
BCR8PM-14LG	125	800	107	8	80	(I,II,III)30	O		
	150	700							
BCR8PM-14LJ	125	800	107	8	80	(I,II,III)30	O		
	150	700							
BCR8PM-16LA	125	800	88	8	80	(I,II,III)30	O		
BCR8PM-16LG	150	800	107	8	80	(I,II,III)30	O		
BCR8PM-20LA	125	1000	88	8	80	(I,II,III)30	O		

Package	Part No.	Ratings					Characteristics		Status
		T _J (°C)	V _{DRM} (V)	T _C (°C)	I _T (RMS) (A)	I _{TSM} (A)	I _{GT} (max) (mA)		
TO-220F	BCR10PM-12LA	125	600	85	10	100	(I,II,III)30	O	
	BCR10PM-12LB	150	600	110	10	100	(I,II,III)30	O	
	BCR10PM-12LD	150	600	82	10	60	(I,II,III)50	O	
	BCR10PM-12LG	150	600	103	10	100	(I,II,III)30	O	
	BCR10PM-14LJ	125	800	103	10	100	(I,II,III)30	O	
		150	700						
	BCR12PM-12LA	125	600	74	12	120	(I,II,III)30	O	
	BCR12PM-12LB	150	600	99	12	120	(I,II,III)30	O	
	BCR12PM-12LD	150	600	92	12	72	(I,II,III)50	O	
	BCR12PM-12LG	150	600	92	12	120	(I,II,III)30	O	
	BCR12PM-14LA	125	700	74	12	120	(I,II,III)30	O	
	BCR12PM-14LG	125	800	93	12	120	(I,II,III)30	O	
		150	700						
	BCR12PM-14LJ	125	800	93	12	120	(I,II,III)30	O	
	150	700							
BCR16PM-12LA	125	600	71	16	160	(I,II,III)30	O		
BCR16PM-12LB	150	600	96	16	160	(I,II,III)30	O		
BCR16PM-12LD	150	600	60	16	96	(I,II,III)50	O		
BCR16PM-12LG	150	600	87	16	160	(I,II,III)30	O		
BCR16PM-14LG	125	800	87	16	160	(I,II,III)30	O		
	150	700							
BCR16PM-14LJ	125	800	87	16	160	(I,II,III)30	O		
	150	700							
BCR16PM-16LH	150	800	87	16	170	(I,II,III)50	O		
BCR16PR-12LB	150	600	87	16	160	(I,II,III)30	O		
BCR20PM-14LJ	125	800	86	20	200	(I,II,III)30	O		
	150	700							
BCR25PM-14LJ	125	800	62	25	250	(I,II,III)50	O		
	150	700							
TO-220FL	BCR3LM-12LB	150	600	130	3	30	(I,II,III)20	O	
	BCR3LM-12RB	150	600	130	3	30	(I,II,III)15	O	
	BCR3LM-14LB	125	800	130	3	30	(I,II,III)30	O	
		150	700						
	BCR5LM-12LB	150	600	113	5	50	(I,II,III)20	O	
	BCR5LM-12RB	150	600	122	5	50	(I,II,III)15	O	
	BCR5LM								

Triacs

Package	Part No.	Ratings					Characteristics		Status
		T _J (°C)	V _{DRM} (V)	T _C (°C)	I _T (RMS) (A)	I _{TSM} (A)	I _{GT} (max) (mA)		
TO-220FP	BCR25FM-14LJ	125	800	60	25	250	(I,II,III)50	O	
	BCR25FR-12LB	150	600	62	25	250	(I,II,III)50	O	
	BCR30FM-8LB	150	400	33	30	300	(I,II,III)30	O	
	BCR30FR-8LB	150	400	33	30	300	(I,II,III)30	O	
TO-3P	BCR30AM-12LB	150	600	100	30	300	(I,II,III)50	O	
TO-3PFM	BCR16RM-12LB	150	600	93	16	160	(I,II,III)30	O	
	BCR20RM-30LA	125	1500	83	20	200	(I,II,III)50	O	

[Trigger mode]
I: G⁺, T2⁻

II: G⁻, T2⁺

III: G⁻, T2⁻

IV: G⁺, T2⁺

Package	Part No.	Ratings					Characteristics		Status
		T _J (°C)	V _{DRM} (V)	T _C (°C)	I _T (RMS) (A)	I _{TSM} (A)	I _{GT} (max) (mA)		
TO-3PFM	BCR25RM-12LB	150	600	96	25	250	(I,II,III)50	O	
	BCR40RM-12LB	150	600	61	40	400	(I,II,III)50	O	
LDBPAK (S)-(1)	BCR8CS-12LB	150	600	130	8	80	(I,II,III)30	O	
	BCR10CS-12LB	150	600	128	10	100	(I,II,III)30	O	
	BCR12CS-12LB	150	600	123	12	120	(I,II,III)30	O	
	BCR16CS-16LB	150	800	125	16	160	(I,II,III)30	O	
SOT-223	BCR08DS-14A	125	700	96	0.8	8	(I,II,III)5	O	
	BCR08FS-14A	125	700	87	0.8	8	(I,II,III)10	O	

Thyristors

Package	Part No.	Ratings					Characteristics		Status
		T _J (°C)	V _{DRM} (V)	T _C (°C)	I _T (AV) (A)	I _{TSM} (A)	I _{GT} (max) (mA)		
TO-92 ⁺	CR02AM-8	125	400	30	0.3	10	0.1	O	
	CR03AM-12	110	600	47	0.3	20	0.1	O	
	CR03AM-16	110	800	47	0.3	20	0.1	O	
	CR03AM-16A	125	800	62	0.3	20	0.1	O	
	CR04AM-12A	125	600	54	0.4	10	0.1	O	
	CR05AM-12	110	600	47	0.3	10	0.1	O	
	CR05AM-16	110	800	47	0.3	10	0.1	O	
	CR05AM-16A	125	800	62	0.3	10	0.1	O	
	CR05BM-12A	125	600	30	0.5	8	0.1	O	
	UPAK	CR05AS-8	125	400	57	0.5	10	0.1	O
CR08AS-12A		125	600	51	0.8	10	0.1	O	
MPAK	CR05BS-8	125	400	55	0.1	10	0.1	O	
MP-3A	CR2AS-8UE	125	400	77	2	20	0.2	O	
	CR2AS-16A	125	800	77	2	20	0.1	O	
	CR3AS-8B	150	400	103	3	40	0.1	O	
	CR3AS-8UE	125	400	103	3	40	0.1	O	
	CR3AS-8ME	125	400	70	3	65	30	O	
	CR5AS-8UE	125	400	95	5	65	0.2	O	
	CR5AS-12A	125	600	88	5	90	0.1	O	
	CRD5AS-12B	150	600	113	5	90	0.1	O	
	TO-220F	CR2PM-8UE	125	400	77	2	20	0.2	O
		CR3PM-8ME	125	400	70	3	65	30	O
CR3PM-12G		125	600	103	3	70	0.1	O	
CR6PM-12A		125	600	85	6	90	10	O	

Notes) Production Status

- O: In Mass Production
- SPL: Samples are available
- Δ: Long delivery date(Lead time: 3 months)
- B: Not recommended for new design

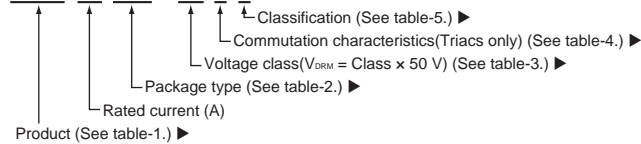
Ordering Condition

- ◆: Large order only (Unit: Refer to packing unit (P.47 to 49))

Part No. Designation

Part No. Designation of Thyristors and Triacs

CR 12 CM - 12 B
BCR 12 CM - 12 L B



▶ Table-1. Product

Symbol	Product
CR	Thyristors
BCR	Triacs
CRD	Reverse conduction Thyristors

▶ Table-2. Package type

Symbol	Package type
BS	MPAK
CM	TO-220, TO-220AB(TO-220ABS)
FM	TO-220FP
AS	UPAK, MP-3A, DPAK(L)-(3)
AM	TO-92, TO-220, TO-3P
CS	LDBPAK(S)-(1)
PM	TO-220F, TO-220F(2)
LM	TO-220FL
RM	TO-3PFM
DS	SOT-223
EM	MP-5
BM	TO-92 (special pin assignment)
ES	UPAK (special pin assignment)
FS	SOT-223 (special pin assignment)

▶ Table-3. Voltage class

Symbol	V _{DRM} (V)
8	400
12	600
14	700
16	800
20	1000
30	1500

▶ Table-4. Commutation characteristics

Symbol	Commutation characteristics
L	Commutation assurance (for inductive load)
R	Without commutation assurance (for resistance load)

▶ Table-5. Classification

Symbol	Chip structure	Junction temperature T _J (max)	Feature
None	Mesa glass	125°C or 110°C	—
A	Planar	125°C	—
B		150°C	T _J (max) = 150°C
C		150°C	Application specified
D		150°C	Application specified
E		125°C or 150°C	TO-220F(2) package
G		150°C	New generation package
H		150°C	High commutation
J		125°C or 150°C	New generation chip
K		150°C	Logic level
UE		125°C	Substitute of ex-NEC part (IGT: μA)
ME	125°C	Substitute of ex-NEC part (IGT: mA)	

Photocouplers for General Type

Please see the website (<http://www.renesas.com/products/opto/index.jsp>) for inquire the detail information of products.

■ DC Input / Single Transistor Output Type

Package	Part No.	Ratings			Characteristics						Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.		
					RANK	min. (%)	max. (%)	I _F (mA)		V _{CE} (V)	
4pin-DIP	PS2561F-1	5	80	40	K	300	600	5	5	5, 7 (R _L = 100 Ω)	○
4pin-DIP(LF)	PS2561FL-1				N	80	600	5	5		
16pin-DIP	PS2501-4	5	80	50	N	50	200	5	5	[5, 25] (R _L = 100 Ω)	○
16pin-DIP(LF)	PS2501L-4				N	50	200	5	5		
4pin-DIP	PS2513-1	5	120	30	N	50	200	5	5	[5, 25] (R _L = 100 Ω)	○
4pin-DIP(LF)	PS2513L-1				N	50	200	5	5		
4pin-DIP	PS2514-1	5	40	20	N	50	200	5	5	[15, 15] (R _L = 5 kΩ)	○
4pin-DIP(LF)	PS2514L-1				N	50	200	5	5		
4pin-SOP	PS2701A-1	3.75	70	30	P	150	300	5	5	5, 7 (R _L = 100 Ω)	○
					L	100	300	5	5		
					M	50	150	5	5		
					N	50	300	5	5		
	PS2703-1	3.75	120	30	K	200	400	5	5	10, 10 (R _L = 1 kΩ)	○
					L	100	300	5	5		
					M	50	150	5	5		
					N	50	400	5	5		
4pin-SSOP	PS2801C-1	2.5	80	30	P	150	300	5	5	5, 7 (R _L = 100 Ω)	○
					L	100	300	5	5		
					M	100	400	5	5		
					N	50	400	5	5		
16pin-SSOP	PS2801C-4	2.5	80	30	M	100	400	5	5	5, 7 (R _L = 100 Ω)	○
					N	50	400	5	5		
					M	100	400	5	5		
					N	50	400	5	5		

■ DC Input / Low LED Current Type

Package	Part No.	Ratings			Characteristics						Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.		
					RANK	min. (%)	max. (%)	I _F (mA)		V _{CE} (V)	
4pin-DIP	PS2503-1	5	40	30	K	200	400	1	5	20, 30 (R _L = 10 kΩ)	○
4pin-DIP(LF)	PS2503L-1				L	150	300	1	5		
					M	100	200	1	5		
					N	100	400	1	5		
4pin-SOP	PS2711-1	3.75	40	40	K	200	400	1	5	4, 5 (R _L = 100 Ω)	○
					L	150	300	1	5		
					M	100	200	1	5		
					N	100	400	1	5		
4pin-SSOP	PS2811-1	2.5	40	40	K	200	400	1	5	4, 5 (R _L = 100 Ω)	○
					L	150	300	1	5		
					M	100	200	1	5		
					N	100	400	1	5		
16pin-SSOP	PS2811-4	2.5	40	40	N	100	400	1	5	4, 5 (R _L = 100 Ω)	○
12pin-SSOP	PS2841-4A PS2841-4B	1.5	70	20	N	100	400	1	0.4	[20, 110] (R _L = 5 kΩ)	○
4pin-MFL (Mini Flat-lead)	PS2911-1	2.5	40	40	K	200	400	1	5	5, 10 (R _L = 100 Ω)	○
					L	150	300	1	5		
					M	100	200	1	5		
					N	100	400	1	5		
	PS2913-1	2.5	120	30	K	100	200	1	5	10, 10 (R _L = 100 Ω)	○
					L	75	150	1	5		
					M	50	100	1	5		
					N	50	200	1	5		

Notes) Production Status ○: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date(Lead time: 3 months)

Ordering Condition ◆: Large order only
 (Unit: Refer to packing unit (P.47 to 49))

Photocouplers for General Type

■ DC Input / Single Transistor Output Type for Various Safety Standard

Package	Part No.	Ratings			Characteristics					Status	
		BV @ 1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.		
					RANK	min. (%)	max. (%)	I _F (mA)			V _{CE} (V)
4pin-LSOP	PS2381-1	5	80	50	W	130	260	5	5	4, 5 (R _L = 100 Ω)	○
					L	100	300	5	5		
					M	50	150	5	5		
					N	50	400	5	5		
4pin-DIP 4pin-DIP(LF) 4pin-DIP(LF-L1) 4pin-DIP(LF-L2)	PS2561D-1 PS2561DL-1 PS2561DL1-1 PS2561DL2-1	5	80	50	L	200	400	5	5	3, 5 (R _L = 100 Ω)	○
					W	130	260	5	5		
					Q	100	200	5	5		
					H	80	160	5	5		
4pin-SOP	PS2761B-1	3.75	70	50	N	50	400	5	5	4, 5 (R _L = 100 Ω)	○
					K	200	400	5	5		
					L	100	300	5	5		
					M	50	150	5	5		
4pin-SSOP	PS2861B-1	3.75	70	50	N	50	400	5	5	4, 5 (R _L = 100 Ω)	○
					L	100	300	5	5		
					W	130	260	5	5		
					M	50	150	5	5		

■ DC Input / Darlington Transistor Output Type

Package	Part No.	Ratings			Characteristics					Status	
		BV @ 1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.		
					RANK	min. (%)	max. (%)	I _F (mA)			V _{CE} (V)
4pin-DIP 4pin-DIP(LF)	PS2502-1 PS2502L-1	5	40	200	K	2000	-	1	2	100, 100 (R _L = 100 Ω)	○
					L	700	3400	1	2		
					M	200	1000	1	2		
					N	200	-	1	2		
16pin-DIP 16pin-DIP(LF)	PS2502-4 PS2502L-4	5	40	160	N	200	-	1	2	100, 100 (R _L = 100 Ω)	○
4pin-SOP	PS2702-1	3.75	40	200	K	2000	-	1	2	200, 200 (R _L = 100 Ω)	○
					L	700	3400	1	2		
					M	200	1000	1	2		
					N	200	-	1	2		
4pin-SSOP	PS2802-1	2.5	40	90	K	2000	-	1	2	200, 200 (R _L = 100 Ω)	○
					L	700	3400	1	2		
					M	200	1000	1	2		
					N	200	-	1	2		
16pin-SSOP	PS2802-4	2.5	40	100	N	200	-	1	2	200, 200 (R _L = 100 Ω)	○

■ High Collector to Emitter Voltage Type

Package	Part No.	Ratings			Characteristics					Status	
		BV @ 1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.		
					RANK	min. (%)	max. (%)	I _F (mA)			V _{CE} (V)
4pin-DIP 4pin-DIP(LF)	PS2533-1 PS2533L-1	5	350	150	N	1500	6500	1	2	100, 100 (R _L = 100 Ω)	○
4pin-DIP 4pin-DIP(LF)	PS2535-1 PS2535L-1	5	350	120	L	1500	5500	1	2	18, 5 (R _L = 100 Ω)	○
					N	400	5500	1	2		
4pin-SOP	PS2733-1	2.5	350	150	N	1500	-	1	2	100, 100 (R _L = 100 Ω)	○
4pin-SSOP	PS2833-1	2.5	350	60	N	400	4500	1	2	20, 5 (R _L = 100 Ω)	○
16pin-SSOP	PS2833-4	2.5	350	60	N	400	4500	1	2	20, 5 (R _L = 100 Ω)	○
4pin-MFL (Mini Flat-lead)	PS2933-1	2.5	350	60	N	400	4500	1	2	20, 5 (R _L = 100 Ω)	○

Photocouplers for General Type

■ DC Input / Darlington Transistor Output Type for Various Safety Standard

Package	Part No.	Ratings			Characteristics					Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ. (R _L = 100 Ω)	
					RANK	min. (%)	max. (%)	I _F (mA)		
4pin-DIP	PS2562-1	5	40	200	K	2000	-	1	2	○
4pin-DIP(LF)	PS2562L-1				L	700	3400	1	2	
4pin-DIP(LF-L1)	PS2562L1-1				M	200	1000	1	2	
4pin-DIP(LF-L2)	PS2562L2-1									

■ AC Input / Single Transistor Output Type

Package	Part No.	Ratings			Characteristics					Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.	
					RANK	min. (%)	max. (%)	I _F (mA)		
4pin-DIP	PS2505-1	5	80	50	N	80	600	±5	5	○
4pin-DIP(LF)	PS2505L-1				Q	50	150	±1	5	
16pin-DIP	PS2505-4				N	80	600	±5	5	
16pin-DIP(LF)	PS2505L-4									
4pin-SOP	PS2705A-1	3.75	70	30	L	100	300	±5	5	○
					M	50	150	±5	5	
					N	50	300	±5	5	
4pin-SSOP	PS2805C-1	2.5	80	30	M	100	400	±5	5	○
					N	50	400	±5	5	
					M	100	400	±5	5	
16pin-SSOP	PS2805C-4	2.5	80	30	M	100	400	±5	5	○
					N	50	400	±5	5	
					N	50	400	±5	5	

■ AC Input / Low LED Current Type

Package	Part No.	Ratings			Characteristics					Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.	
					RANK	min. (%)	max. (%)	I _F (mA)		
4pin-SOP	PS2715-1	3.75	40	40	N	100	400	±1	5	○
4pin-SSOP	PS2815-1	2.5	40	40	N	100	400	±1	5	○
16pin-SSOP	PS2815-4	2.5	40	40	N	100	400	±1	5	○
4pin-MFL (Mini Flat-lead)	PS2915-1	2.5	40	40	N	100	400	±1	5	○
12pin-SSOP	PS2845-4A	1.5	70	20	N	100	400	±1	0.4	○

■ AC Input / Single Transistor Output Type for Various Safety Standard

Package	Part No.	Ratings			Characteristics					Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.	
					RANK	min. (%)	max. (%)	I _F (mA)		
4pin-DIP	PS2565-1	5	80	50	N	80	400	±5	5	○
4pin-DIP(LF)	PS2565L-1									
4pin-DIP(LF-L1)	PS2565L1-1									
4pin-DIP(LF-L2)	PS2565L2-1									

■ AC Input / Darlington Transistor Output Type

Package	Part No.	Ratings			Characteristics					Status
		BV @1 minute (kVr.m.s.)	V _{CEO} (V)	I _C (mA)	CTR(Current Transfer Ratio)				tr, tf [ton, toff] (μs) typ.	
					RANK	min. (%)	max. (%)	I _F (mA)		
4pin-DIP	PS2506-1	5	40	200	N	200	-	±1	2	○
4pin-DIP(LF)	PS2506L-1									

Notes) Production Status O: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date(Lead time: 3 months)

Ordering Condition ♦: Large order only
 (Unit: Refer to packing unit (P.47 to 49))

Photocouplers for High Speed Type

■ 1Mbps — Analog Output Type

Package	Part No.	Ratings			Characteristics					Status
		BV @ 1 minute (kVr.m.s.)	V _{CC} (V)	I _O (mA)	CTR (%)	I _F (mA)	V _{CC} (V)	V _O (V)	t _{PHL} , t _{PLH} (μs) max.	
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS8302L PS8302L2	5	35	8	More than 15	16	4.5	0.4	0.8 (R _L = 1.9 kΩ)	○
8pin-DIP	PS8501									
8pin-DIP(LF-L1)	PS8501L1									
8pin-DIP(LF-L2)	PS8501L2									
8pin-DIP(LF)	PS8501L3									
8pin-DIP	PS8502	3.75	35	8	15 to 35	16	4.5	0.4	0.8, 1.2 (R _L = 2.2 kΩ)	○
8pin-DIP(LF-L1)	PS8502L1									
8pin-DIP(LF-L2)	PS8502L2									
8pin-DIP(LF)	PS8502L3									
5pin-SOP	PS8101									
8pin-SSOP	PS8802-1 PS8802-2	2.5	35	8	15 to 45	16	4.5	0.4	0.8, 1.2 (R _L = 2.2 kΩ)	○
	PS8821-1 PS8821-2	2.5	7	8	Up to 20	16	3.3	0.4	0.6, 0.9 (R _L = 1.8 kΩ)	○

■ 1Mbps — Digital Output Type

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{CC} (V)	I _O (mA)	I _{FHL} (mA) max.	t _{PHL} , t _{PLH} (μs) max.	
5pin-SOP	PS9113	3.75	35	15	5	0.5, 0.75 (R _L = 20 kΩ)	○
	PS9122	3.75	7	10	5	0.5, 0.7 (R _L = 350 Ω)	○
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9303L PS9303L2	5	-0.5 to +25	25	5(I _{FHL})	0.5, 0.55 (C _L = 100 pF)	○
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9313L PS9313L2	5	-0.5 to +35	15	5	0.5, 0.75 (R _L = 20 kΩ)	○
8pin-DIP	PS9513	5	-0.5 to +35	15	5	0.5, 0.75 (R _L = 20 kΩ)	○
8pin-DIP(LF-L1)	PS9513L1						
8pin-DIP(LF-L2)	PS9513L2						
8pin-DIP(LF)	PS9513L3						
8pin-SSOP	PS9822-1 PS9822-2	2.5	7	25	5	0.5, 0.7 (R _L = 350 Ω)	○

■ 5Mbps — Digital Output Type

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{CC} (V)	I _O (mA)	I _{FHL} (mA) max.	t _{PHL} , t _{PLH} (μs) max.	
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9309L PS9309L2	5	-0.5 to +20	25	3	0.25	○

■ 10Mbps — Digital Output Type

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{CC} (V)	I _O (mA)	I _{FHL} (mA) max.	t _{PHL} , t _{PLH} (ns) max.	
5pin-SOP	PS9117A	3.75	7	25	5	75 (R _L = 350 Ω)	○
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9317L PS9317L2	5	7	25	5	75 (R _L = 350 Ω)	○
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9324L PS9324L2						
8pin-DIP	PS9587	5	7	25	5	75 (R _L = 350 Ω)	○
8pin-DIP(LF-L1)	PS9587L1						
8pin-DIP(LF-L2)	PS9587L2						
8pin-DIP(LF)	PS9587L3						
8pin-SSOP	PS9817A-1	2.5	7	25	5	75 (R _L = 350 Ω)	○
	PS9817A-2	2.5	7	25	5	75 (R _L = 350 Ω)	○
5pin-SOP	PS9121	3.75	7	25	5	75 (R _L = 350 Ω)	○
	PS9124	3.75	7	25	3	75 (R _L = 350 Ω)	○
8pin-SSOP	PS9821-1 PS9821-2	2.5	7	25	5	75 (R _L = 350 Ω)	○
8pin-LSDIP	PS9924	7.5	7	25	5	75 (R _L = 350 Ω)	○

Photocouplers for High Speed Type

■ 15Mbps — Digital Output Type

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{CC} (V)	I _O (mA)	I _{FHL} (mA) max.	t _{PHL} , t _{PLH} (ns) max.	
5pin-SOP	PS9151	3.75	0 to 5.5	2	5	60	O
	PS9123	3.75	7	13	5	60	O
8pin-SSOP	PS9851-1 PS9851-2	2.5	0 to 5.5	2	6	60	O
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9351L PS9351L2	5	0 to 5.5	2	5	60	O

■ Isolation Amplifier — Analog Output Type

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{DD} (V)	G (V/V)	NL (%) max.	f _C (kHz)	
8pin-DIP(LF-L4)	PS8551L4	5	0 to 5.5	7.76 to 8.24	0.35	Up to 50	O

■ Isolation Amplifier — Digital Output Type

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{DD} (V)	Resolution (bits) min.	NL (LSB) max.	f _{CLK} (MHz)	
8pin-DIP(LF-L4)	PS9551L4	5	0 to 5.5	15	30	8.2 to 13.2	O

■ IGBT Drive

Package	Part No.	Ratings			Characteristics		Status
		BV @ 1 minute (kVr.m.s.)	V _{CC} -V _{EE} (V)	I _O (A) min.	I _{FLH} (mA) max.	t _{PHL} , t _{PLH} (μs) max.	
8pin-SDIP(LF) 8pin-SDIP(LF-L2)	PS9305L PS9305L2	5	0 to 35	2.5	5	0.25	O
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9306L PS9306L2	5	0 to 35	0.6	7	0.4	O
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9307L PS9307L2	5	0 to 35	0.6	5	0.175	O
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9308L PS9308L2	5	0 to 35	2	5	0.25	O
6pin-SDIP(LF) 6pin-SDIP(LF-L2)	PS9331L PS9331L2	5	0 to 35	2.5	5	0.175	SPL
8pin-SDIP(LF) 8pin-SDIP(LF-L2)	PS9332L PS9332L2	5	0 to 35	2	5	0.2	SPL
8pin-DIP 8pin-DIP(LF-L1) 8pin-DIP(LF-L2) 8pin-DIP(LF)	PS9505 PS9505L1 PS9505L2 PS9505L3	5	0 to 35	2.5	5	0.25	O
8pin-DIP 8pin-DIP(LF-L1) 8pin-DIP(LF-L2) 8pin-DIP(LF)	PS9506 PS9506L1 PS9506L2 PS9506L3	5	0 to 35	0.6	7	0.4	O
16pin-SSOP (SO-16)	PS9402	5	0 to 35	2.5	5	0.25	O
8pin-LSDIP	PS9905	7.5	0 to 35	2.5	6	0.15	O

Notes) Production Status O: In Mass Production
 SPL: Samples are available
 Δ: Long delivery date(Lead time: 3 months)

Ordering Condition ♦: Large order only
 (Unit: Refer to packing unit (P.47 to 49))

Optical Coupled MOS FETs(Solid State Relay) Characteristic Table

■ DIP Type

Part No.		PS7113	PS7141E	PS7160	PS7341	PS7360
Item						
High Break Down Voltage ($V_L \geq 400V$)			•	•	•	•
High Continuous Load Current ($I_L \geq 200mA$)		•				
Low On-state Resistance	$R_{on} \leq 10 \Omega$	•				
	$R_{on} \leq 1 \Omega$					
High Isolation Voltage (BV)					•	•
2-ch Type		•	•	•		
Status		0	0	0	0	0

■ SOP Type

Part No.		PS7206	PS7241	PS7241E	PS720C
Item					
High Break Down Voltage ($V_L \geq 400V$)			•	•	
High Continuous Load Current ($I_L \geq 200mA$)		•			•
Low On-state Resistance	$R_{on} \leq 10 \Omega$				
	$R_{on} \leq 1 \Omega$	•			•
Low C x R					
Low Output Capacitance					
2-ch Type			•		
Status		0	0	0	0

■ Mini Flat-lead Type

Part No.		PS7804
Item		
High Break Down Voltage ($V_L \geq 400V$)		
High Continuous Load Current ($I_L \geq 200mA$)		•
Low On-state Resistance	$R_{on} \leq 10 \Omega$	•
	$R_{on} \leq 1 \Omega$	
Low C x R		•
Low Output Capacitance		
2-ch Type		
Status		0

■ Small Flat-lead Type

Part No.		PS7901D	PS7902	PS7904
Item				
High Break Down Voltage ($V_L \geq 400V$)				
High Continuous Load Current ($I_L \geq 200mA$)			•	•
Low On-state Resistance	$R_{on} \leq 10 \Omega$		•	•
	$R_{on} \leq 1 \Omega$			
Low C x R		•		
Low Output Capacitance		•		
2-ch Type				
Status		0	0	0

Optical Coupled MOS FETs(Solid State Relay) Characteristic Table

■ 6pin-DIP Type

Item		Part No.	PS7113-1A	PS7141E-1A	PS7160-1A	PS7341-1A	PS7360-1A	
Output Type			Normally Open 1a	Normally Open 1a	Normally Open 1a	Normally Open 1a	Normally Open 1a	
MOS FET	Break Down Voltage	V_L	100 V	400 V	600 V	400 V	600 V	
	Continuous Load Current	Connection A	I_L	350 mA	120 mA	90 mA	150 mA	90 mA
		Connection B	I_L	450 mA	150 mA	130 mA	200 mA	130 mA
		Connection C	I_L	700 mA	250 mA	200 mA	300 mA	200 mA
	Pulse Load Current	I_{LP}	600 mA	240 mA	250 mA	300 mA	250 mA	
	On-state Resistance (Typ.)	R_{on}		0.9 Ω	36 Ω	42.0 Ω	20.0 Ω	41.0 Ω
			On-state Resistance (Max.)		2.5 Ω	50.0 Ω	50.0 Ω	30.0 Ω
	Output Capacitance (Typ.)	C_{out}	250 pF	36 pF	110 pF	65 pF	110 pF	
	Off-State Leakage Current (Max.)	I_{Loff}	1 μ A	1 μ A	1 μ A	1 μ A	1 μ A	
Power Dissipation (Max.)	P_D	560 mW	560 mW	560 mW	560 mW	560 mW		
Coupled	Turn-on Time (Max.)	t_{on}	3.0 ms	1.0 ms	1.5 ms	1.0 ms	2.0 ms	
	Turn-off Time (Max.)	t_{off}	0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms	
Diode	LED On-state Current (Max.)	I_{Fon}	2 mA	5 mA	2 mA	2 mA	2 mA	
	Recommended LED Off Voltage (Max.)	V_F	0.5 V	0.5 V	0.5 V	0.5 V	0.5 V	
	Forward Voltage (Max.)	V_F	1.4 V	1.4 V	1.4 V	1.4 V	1.4 V	
	Reverse Current (Max.)	I_R	5 μ A	5 μ A	5 μ A	5 μ A	5 μ A	
	Maximum Forward Current (Max.)	I_F	50 mA	50 mA	50 mA	50 mA	50 mA	
	Power Dissipation (Max.)	P_D	50 mW	50 mW	50 mW	50 mW	50 mW	
Isolation Voltage	BV	1 500 Vr.m.s.	1 500 Vr.m.s.	1 500 Vr.m.s.	3 750 Vr.m.s.	3 750 Vr.m.s.		
Operating Ambient Temperature	T_A	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C		
Storage Temperature	T_{sta}	-40 to +100°C	-40 to +100°C	-40 to +100°C	-40 to +125°C	-40 to +125°C		
Status			O	O	O	O	O	

■ 8pin-DIP Type

Item		Part No.	PS7113-2A	PS7141-2A	PS7141E-2A	PS7160-2A	
Output Type			Normally Open 2a	Normally Open 2a	Normally Open 2a	Normally Open 2a	
MOS FET	Break Down Voltage	V_L	100 V	400 V	400 V	600 V	
	Continuous Load Current	I_L	350 mA/ch	150 mA/ch	100 mA/ch	90 mA/ch	
		Pulse Load Current	I_{LP}	600 mA/ch	300 mA/ch	200 mA/ch	250 mA/ch
		On-state Resistance (Typ.)	R_{on}		0.9 Ω	20.0 Ω	36 Ω
	On-state Resistance (Max.)				2.5 Ω	30.0 Ω	50.0 Ω
	Output Capacitance (Typ.)	C_{out}	250 pF/ch	65 pF/ch	36 pF/ch	110 pF/ch	
	Off-State Leakage Current (Max.)	I_{Loff}	1 μ A	1 μ A	1 μ A	1 μ A	
	Power Dissipation (Max.)	P_D	375 mW/ch	375 mW/ch	375 mW/ch	375 mW/ch	
	Coupled	Turn-on Time (Max.)	t_{on}	3.0 ms	1.0 ms	1.0 ms	1.5 ms
Turn-off Time (Max.)		t_{off}	0.2 ms	0.2 ms	0.2 ms	0.2 ms	
Diode	LED On-state Current (Max.)	I_{Fon}	2 mA	2 mA	5 mA	2 mA	
	Recommended LED Off Voltage (Max.)	V_F	0.5 V	0.5 V	0.5 V	0.5 V	
	Forward Voltage (Max.)	V_F	1.4 V	1.4 V	1.4 V	1.4 V	
	Reverse Current (Max.)	I_R	5 μ A	5 μ A	5 μ A	5 μ A	
	Maximum Forward Current (Max.)	I_F	50 mA/ch	50 mA/ch	50 mA/ch	50 mA/ch	
	Power Dissipation (Max.)	P_D	50 mW/ch	50 mW/ch	50 mW/ch	50 mW/ch	
Isolation Voltage	BV	1 500 Vr.m.s.	1 500 Vr.m.s.	1 500 Vr.m.s.	1 500 Vr.m.s.		
Operating Ambient Temperature	T_A	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C		
Storage Temperature	T_{sta}	-40 to +100°C	-40 to +100°C	-40 to +100°C	-40 to +100°C		
Status			O	O	O	O	

■ 8pin-SOP Type

Item		Part No.	PS7241-2A	
Output Type			Normally Open 2a	
MOS FET	Break Down Voltage	V_L	400 V	
	Continuous Load Current	I_L	120 mA/ch	
		Pulse Load Current	I_{LP}	200 mA/ch
		On-state Resistance (Typ.)	R_{on}	
	On-state Resistance (Max.)			
	Output Capacitance (Typ.)	C_{out}	65 pF/ch	
	Off-State Leakage Current (Max.)	I_{Loff}	1 μ A	
	Power Dissipation (Max.)	P_D	180 mW/ch	
	Coupled	Turn-on Time (Max.)	t_{on}	1.0 ms
Turn-off Time (Max.)		t_{off}	0.2 ms	
Diode	LED On-state Current (Max.)	I_{Fon}	2 mA	
	Recommended LED Off Voltage (Max.)	V_F	0.5 V	
	Forward Voltage (Max.)	V_F	1.4 V	
	Reverse Current (Max.)	I_R	5 μ A	
	Maximum Forward Current (Max.)	I_F	50 mA/ch	
	Power Dissipation (Max.)	P_D	50 mW/ch	
Isolation Voltage	BV	1 500 Vr.m.s.		
Operating Ambient Temperature	T_A	-40 to +85°C		
Storage Temperature	T_{sta}	-40 to +100°C		
Status			O	

Optical Coupled MOS FETs(Solid State Relay) Characteristic Table

■ 4pin-SOP Type

Item		Part No.	PS7206-1A	PS7241E-1A	PS720C-1A
Output Type			Normally Open 1a	Normally Open 1a	Normally Open 1a
MOS FET	Break Down Voltage	V_L	60 V	400 V	60 V
	Continous Load Current	I_L	600 mA	120 mA	1.25 A
	Pulse Load Current	I_{LP}	1.2 A	240 mA	2.5 A
	On-state Resistance (Typ.)	R_{on}	0.6 Ω	22 Ω	0.1 Ω
	On-state Resistance (Max.)		0.8 Ω	35.0 Ω	0.19 Ω
	Output Capacitance (Typ.)	C_{out}	70 pF	50 pF	230 pF
	Off-State Leakage Current (Max.)	I_{Loff}	1 μ A	1 μ A	1 μ A
	Power Dissipation (Max.)	P_D	300 mW	300 mW	300 mW
Coupled	Turn-on Time (Max.)	t_{on}	2.0 ms	1.0 ms	10 ms
	Turn-off Time (Max.)	t_{off}	0.5 ms	0.2 ms	0.5 ms
Diode	LED On-state Current (Max.)	I_{Fon}	2 mA	4 mA	4 mA
	Recommended LED Off Voltage (Max.)	V_F	0.5 V	0.5 V	0.1 mA (I_{Foff})
	Forward Voltage (Max.)	V_F	1.4 V	1.4 V	1.4 V
	Reverse Current (Max.)	I_R	5 μ A	5 μ A	5 μ A
	Maximum Forward Current (Max.)	I_F	50 mA	50 mA	50 mA
	Power Dissipation (Max.)	P_D	50 mW	50 mW	50 mW
	Isolation Voltage	BV	1 500 Vr.m.s.	1 500 Vr.m.s.	1 500 Vr.m.s.
Operating Ambient Temperature	T_A	-40 to +85°C	-40 to +85°C	-40 to +85°C	
Storage Temperature	T_{stg}	-40 to +100°C	-40 to +100°C	-40 to +100°C	
Status			O	O	O

■ 4pin-Small Flat-lead Type

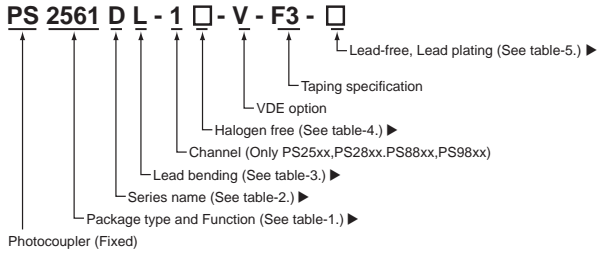
Item		Part No.	PS7901D-1A	PS7902-1A	PS7904-1A
Output Type			Normally Open 1a	Normally Open 1a	Normally Open 1a
MOS FET	Break Down Voltage	V_L	40 V	40 V	60 V
	Continous Load Current	I_L	120 mA	250 mA	400 mA
	Pulse Load Current	I_{LP}	200 mA	500 mA	800 mA
	On-state Resistance (Typ.)	R_{on}	12 Ω	1.1 Ω	1.1 Ω
	On-state Resistance (Max.)		16 Ω	1.6 Ω	1.5 Ω
	Output Capacitance (Typ.)	C_{out}	0.75 pF	10.5 pF	27 pF
	Off-State Leakage Current (Max.)	I_{Loff}	1 nA	10 nA	10 nA
	Power Dissipation (Max.)	P_D	250 mW	250 mW	250 mW
Coupled	Turn-on Time (Max.)	t_{on}	0.5 ms	0.25 ms	0.5 ms
	Turn-off Time (Max.)	t_{off}	0.5 ms	0.25 ms	0.5 ms
Diode	LED On-state Current (Max.)	I_{Fon}	4 mA	4 mA	4 mA
	Recommended LED Off Voltage (Max.)	V_F	0.1 mA (I_{Foff})	0.1 mA (I_{Foff})	0.1 mA (I_{Foff})
	Forward Voltage (Max.)	V_F	1.4 V	1.4 V	1.4 V
	Reverse Current (Max.)	I_R	5 μ A	5 μ A	5 μ A
	Maximum Forward Current (Max.)	I_F	50 mA	50 mA	50 mA
	Power Dissipation (Max.)	P_D	50 mW	50 mW	50 mW
	Isolation Voltage	BV	500 Vr.m.s.	500 Vr.m.s.	500 Vr.m.s.
Operating Ambient Temperature	T_A	-40 to +85°C	-40 to +85°C	-40 to +85°C	
Storage Temperature	T_{stg}	-40 to +100°C	-40 to +100°C	-40 to +100°C	
Status			O	O	O

■ 4pin-Mini Flat-lead Type

Item		Part No.	PS7804-1A
Output Type			Normally Open 1a
MOS FET	Break Down Voltage	V_L	60 V
	Continous Load Current	I_L	400 mA
	Pulse Load Current	I_{LP}	800 mA
	On-state Resistance (Typ.)	R_{on}	1.1 Ω
	On-state Resistance (Max.)		1.5 Ω
	Output Capacitance (Typ.)	C_{out}	27 pF
	Off-State Leakage Current (Max.)	I_{Loff}	1 nA
	Power Dissipation (Max.)	P_D	250 mW
Coupled	Turn-on Time (Max.)	t_{on}	0.5 ms
	Turn-off Time (Max.)	t_{off}	0.5 ms
Diode	LED On-state Current (Max.)	I_{Fon}	4 mA
	Recommended LED Off Voltage (Max.)	V_F	0.1 mA (I_{Foff})
	Forward Voltage (Max.)	V_F	1.4 V
	Reverse Current (Max.)	I_R	5 μ A
	Maximum Forward Current (Max.)	I_F	50 mA
	Power Dissipation (Max.)	P_D	50 mW
	Isolation Voltage	BV	500 Vr.m.s.
Operating Ambient Temperature	T_A	-40 to +85°C	
Storage Temperature	T_{stg}	-40 to +100°C	
Status			O

Part No. Designation

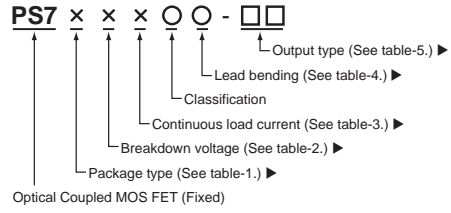
Part No. Designation of Photocoupler (House)



► Table-1. Package type and Function ► Table-2. Series name ► Table-3. Lead bending

Symbol	Package type	Function	Symbol	Series name	Symbol	Lead bending
23xx	LSOP	Tr. output	A	Shrink chip	L, L3	Lead Bending Type (Gull-wing)
25xx	DIP	Tr. output	B	High operating temperature	L1	Lead Bending Type (Long Creepage Distance)
27xx	SOP	Tr. output	C, D etc.		L2, L4	Lead Bending Type (Long Creepage Distance, Gull-wing)
28xx	SSOP	Tr. output	► Table-4. Halogen free		► Table-5. Lead-free, Lead plating	
29xx	Mini Flat-lead	Tr. output	Symbol	Halogen free	Symbol	Lead-free, Lead plating
8xxx	DIP, SDIP, LSDIP	Analog	Blank	Include halogen	A	Pb free (Sn-Bi)
9xxx	SOP or SSOP	Digital	Y	Halogen free	AX	Pb free (Ni/Pd/Au)




















Part No. Designation of Optical Coupled MOS FET (House)



► Table-1. Package type ► Table-2. Breakdown voltage ► Table-3. Continuous load current ► Table-4. Lead bending

Symbol	Package type	Symbol	Breakdown voltage (V)	Symbol	Continuous load current (mA)	Symbol	Lead bending
1	W type / DIP	0	0 to 99	0	0 to 99	Blank	DIP, SOP, SSOP, MFL, SFL
2	W type / SOP	1	100 to 199	1	100 to 199	L	DIP (LF)
3	2 Md type / DIP	2	200 to 299	2	200 to 299	► Table-5. Output type	
8	W type / Mini Flat-lead	3	300 to 399	3	300 to 399	Symbol	Output type
9	W type / Small Flat-lead	4	400 to 499	4	400 to 499	1A	1-ch Normally open
		5	500 to 599	5	500 to 599	2A	2-ch Normally open
		6	600 to 699	6	600 to 699		
		A to Z		1.0A to above			















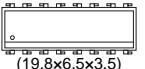



Packages and Standard Taping Specifications

Package (Size WidthxLengthxHeight)	Normalized Name	Package Name	Renesas Code	JEITA Code	Packing Option	Packing Quantity	Packing Device Direction
 (2.9x2.8x1.4)	SC59/ 3pin MM/MPAK	3pin MM	PLSP0003ZD-A	SC-59	Taping	3000	T1B/T2B
 (2.95x2.8)	SC59/ 3pin MM/MPAK	MPAK	PLSP0003ZB-A	SC-59A	Taping	3000 12000	Marking + TL/TR Marking + UL/UR
 (2.95x2.8)	SC59/ 3pin MM/MPAK	MPAK-4	PLSP0004ZA-A	SC-61AA	Taping	3000 12000	Marking + TL/TR Marking + UL/UR
 (4.5x4.0x1.5)	SC62/ 3pin PoMM/UPAK	3pin PoMM	PLZZ0004CC-A	SC-62	Taping	1000	E1/E2/T1/T2
 (4.5x4.25)	SC62/ 3pin PoMM/UPAK	UPAK	PLZZ0004CA-A	SC-62	Taping	1000 4000	Marking + TL/TR Marking + UL/UR
 (4.5x4.0x1.5)	SC62/4pin PoMM	4pin PoMM	-	SC-62	Taping	1000	E1/E2/T1/T2
 (2.0x2.1x0.9)	SC70/3pin SSP	3pin SSP	PTSP0003JA-A	SC-70	Taping	3000	T1/T2
 (2.0x2.1x0.9)	4pin SMM	4pin SMM	-	-	Taping	3000	T1/T2
 (1.6x1.6x0.75)	SC75/3pin USM	3pin USM	PWSP0003KA-A	SC-75	Taping	3000	T1/T2
 (1.6x1.6x0.5)	SC89/3pin TUSM	3pin TUSM	PUSF0003KA-A	SC-89	Taping	3000	T1/T2
 (2.9x2.8x0.9)	SC96/3pin TMM (Mini Mold Thin Type)	3pin TMM (Mini Mold Thin Type)	PTSP0003ZC-A	SC-96	Taping	3000	T1B/T2B
 (2.5x4.6x2.1)	4pin MFL	4pin MFL	-	-	Taping	3500	F3
 (2.5x4.2x1.85)	4pin MFL	4pin MFL	-	-	Taping	3500	F3
 (2.3x2.5x2.9)	4pin SFL	4pin SFL	-	-	Taping	3500	E3
 (2.0x2.05x0.59)	F4pin TSMM (Flat-Lead 4pin Thin-Type Super Mini Mold)	4pin TSMM (Flat-Lead 4pin Thin-Type Super Mini Mold)	-	-	Taping	3000 15000	T1/T2 T1B/T2B
 (2.0x2.1)	SC82AB/ CMPAK-4	CMPAK-4	PTSP0004ZA-A	SC-82AB	Taping	3000 12000	Marking + TL/TR Marking + UL/UR
 (2.0x2.1)	CMFPAK-6	CMFPAK-6	PWSF0006JA-A	-	Taping	3000	EL
 (6.6x7.0)	SOT-223	SOT-223	PRSP0004ZA-A	-	Taping	3000	T1
 (1.62x1.62x0.48)	4pin EFLIP (1.62x1.62)	4pin EFLIP (1.62x1.62)	SXBG0004JB-A	-	Taping	5000	E4
 (1.62x1.62x0.2)	4pin EFLIP-LGA (1.62x1.62)	4pin EFLIP-LGA (1.62x1.62)	SXLG0004JB-A	-	Taping	5000	E4
 (2.9x2.8x1.1)	4pin MM	4pin MM	-	-	Taping	3000 5000	T1/T2 T1B/T2B
 (2.9x2.8x1.4)	SC74A/5pin MM	5pin MM	PLSP0005ZD-A	SC-74A	Taping	3000	E1/E2/T1/T2
 (2.0x2.1x0.9)	SC88A/5pin SSP	5pin SSP	PTSP0005JA-A	SC-88A	Taping	3000	T1/T2
 (2.9x2.8x0.9)	SC95/5pin TMM (Mini Mold Thin Type)	5pin TMM (Mini Mold Thin Type)	PTSP0006ZA-A	SC-95	Taping	3000	T1/T2
 (3.0x3.0x0.9)	6LD3x3MLP	6LD3x3MLP	-	-	Taping	3000	E1/E2
 (2.0x2.1x0.9)	6pin SMM	6pin SMM	-	-	Taping	3000	T1
 (2.9x2.8x1.4)	SC74/6pin MM	6pin MM	PLSP0006ZB-A	SC-74	Taping	3000	T1/T2
 (2.0x2.1x0.9)	SC88/6pin SSP	6pin SSP	PTSP0006JB-A	SC-88	Taping	3000	T2
 (2.9x2.8x0.9)	SC95/6pin TMM (Mini Mold Thin Type)	6pin TMM (Mini Mold Thin Type)	PTSP0006ZA-A	SC-95	Taping	3000	T1/T2
 (2.0x2.1)	CMPAK-6	CMPAK-6	PTSP0006JA-A	-	Taping	3000	TL
 (2.9x2.4x0.85)	SOT-23F	SOT-23F	PVSF0003ZA-A	-	Taping	3000	T1/T2
 (1.4x1.2x0.4)	3pin XSOF	3pin XSOF	PXSF0003ZA-A	-	Taping	3000	T1/T2
 (1.2x1.2x0.3)	3pin XSOF03	3pin XSOF03	PXSF0003LA-A	-	Taping	3000	T1/T2
 (3.8x7.5x2.0)	LSOP-4 (Long Mini Flat Small Outline Package)	4pin-LSOP (Long Mini Flat Small Outline Package)	-	-	Taping	3000	F3
 (4.0x4.4x2.0)	SOP-4	4pin-SOP	-	-	Taping	3500	F3
 (4.0x4.4x2.05)	SOP-4	4pin-SOP	-	-	Taping	3500	F3
 (3.4x4.4x2.6)	SOP-5	5pin-SOP	-	-	Taping	2500	F3
 (2.0x2.1x0.8)	WSOF-6	6pin WSOF	PWSF0006JB-A	-	Taping	3000	E1/E2
 (2.0x2.0x0.8)	HUSON-2020-6	6pin HUSON-2020	PWSN0006JD-A	-	Taping	3000	E2
 (2.7x2x0.65)	HUSON-2027-8	8pin HUSON-2027	PXSN0008KD-A	-	Taping	3000	E1/E2
 (3.3x3.15x0.9)	HVSON-3333-8	8pin HVSON-3333	PVSN0008JD-A	-	Taping	3000	E1/E2
 (6x5.15x1.0)	HVSON-6051-8	8pin HVSON-6051	PVSN0008DA-A	-	Taping	3000	E1/E2
 (2.9x1.9x0.8)	VSOF-1629-8	8pin VSOF-1629	PVSF0008JB-A	-	Taping	3000	T1/T2
 (2.9x1.9x0.8)	VSOF-2429-8	8pin VSOF-2429	PVSF0008JA-A	-	Taping	3000	T1/T2
 (5.0x4.0)	WSON0504-2	WSON0504-2	PWSN0002ZA-B	-	Taping	2000	-
 (3.0x3.0)	WSON0303-6	WSON0303-6	PWSN0006ZA-A	-	Taping	2000	TL/TR
 (5.0x2.0x0.8)	HWSO-6	6pin HWSO	PWSN0006KB-A	-	Taping	3000	E1/E2
 (3.3x3.3)	HWSO-8	8pin HWSO	PWSN0008JB-A	-	Taping	5000	E1/E2
 (3.2x4.8)	HWSO3046-8	HWSO3046-8	PWSN0008JD-A	-	Taping	5000	-
 (6x5.15x1.45)	HSON-8	8pin HSON	PLSN0008KA-A	-	Taping	2500	E1/E2
 (3.0x4.8)	VSON-8	8pin VSON	PVSN0008JA-A	-	Taping	3000	T1/T2
 (3.05x2.85)	TSOJ-8	8pin TSOJ	PTSJ0008JA-A	-	Taping	3000	-
 (5.1x6.1)	WPAK	WPAK	PWSN0008DA-A	-	Taping	2500	EL
 (3.0x4.8)	WPAK (RJ part number+J0)	WPAK (RJ part number+J0)	PWSN0008DA-A	-	Taping	2500	J0
 (5.1x6.1)	WPAK (RJ part number+J53)	WPAK (RJ part number+J53)	PWSN0008DA-A	-	Taping	3000	J53
 (5.1x6.1)	WPAK(3)	WPAK(3)	PWSN0008DC-B	-	Taping	3000	-
 (5.1x6.1)	WPAK(3F)	WPAK(3F)	PWSN0008DE-A	-	Taping	3000	-
 (5.1x6.1)	WPAK-D	WPAK-D(2)	PWSN0008DD-A	-	Taping	3000	-
 (5.1x6.1)	WPAK-D	WPAK-D(3)	PWSN0008DD-B	-	Taping	3000	-
 (2.4x4.4x2.0)	SSOP-4	4pin-SSOP	-	-	Taping	3500	F3
 (5.21x3.95x3.27)	SSOP-8	8pin-SSOP	-	-	Taping	1500	F3
 (5.6x4.4x2.5)	SSOP-12	12pin-SSOP	-	-	Taping	2500	F3
 (10.31x7.49x3.5)	SSOP-16	16pin-SSOP	-	-	Taping	2500	F3
 (3.15x6.4x1.2)	SSOP-16(SO-16)	16pin-SSOP(SO-16)	-	-	Taping	850	E3
 (5.5x5.2x0.9)	TSSOP-8	8pin TSSOP	-	-	Taping	3000	E1/E2
 (5.5x5.2x0.9)	HTSSOP-16	16HTSSOP	-	-	Taping	1000	T3

Packages and Standard Taping Specifications

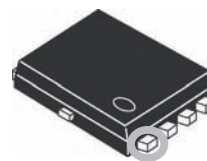
Package (Size WidthxLengthxHeight)	Normalized Name	Package Name	Renesas Code	JEITA Code	Packing Option	Packing Quantity	Packing Device Direction
 (4.9x6.1)	SOP-8	FP-8DA	PRSP0008DD-A	-	Taping	2500	EL
 (5.37x6.0x1.8)	SOP-8	FP-8DA (RJ part number+J0)	PRSP0008DD-A	-	Taping	2500	J0
 (9.08x4.4x2.05)	SOP-8	8pin SOP	-	-	Taping	2500	E1/E2
	SOP-8	8pin-SOP	-	-	Taping	1500	F3
	SOP-16	SOP-16	-	-	Taping	2500	E1/E2/T1/T2
	SOP-20	20pin SOP	-	-	Taping	3000	E1/E2
	HSOP-20	HSOP-20	PRSP0020DF-A	-	Tray	700	-
	HSOP-36	HSOP-36	PRSP0036JC-A	-	Tray	-	-
					Taping	-	-
 (10.2x7.7x1.1)	QFN-56	TNP-56TV	PVQN0056KA-A	-	Taping	2500	-
to be prepared	QFN-40	TNP-40TV	PVQN0040KC-A	-	Taping	2500	-
to be prepared	LFPACK	LFPACK	PTZZ0005DA-A	-	Taping	2500	EL
to be prepared	LFPACK	LFPACK (RJ part number+J0)	PTZZ0005DA-A	-	Taping	2500	J0
	TO-252/ MP-3Z/ZK/ZP	TO-252	PRSS0004ZJ-A	-	-	-	-
	TO-252/ MP-3Z/ZK/ZP	MP-3Z	PRSS0004ZM-B	-	Taping	2000	E1/E2
	TO-252/ MP-3Z/ZK/ZP	MP-3ZK	PRSS0004ZV-A	-	Taping	2500	E1/E2
	TO-252/ MP-3Z/ZK/ZP	MP-3ZP	PRSS0004ZP-A	-	Taping	2500	E1/E2
 (6.5x9.5)	SC63/MP-3A	MP-3A	PRSS0004ZG-A	SC-63	Taping	3000	TL/TR
 (6.5x10.4)	SC63/MP-3A	MP-3A	PRSS0004ZG-A	SC-63	Taping	3000	T1/T2
 (10.0x15.25x4.45)	SC63/MP-3A	MP-3A (RJ part number+J2)	PRSS0004ZG-A	SC-63	Taping	3000	J2
 (10.0x15.25x4.45)	TO-263/ MP-25ZP/ZK	MP-25ZP	PRSS0004AL-A	-	Taping	800	E1/E1B/E2/E2B
	TO-263/ MP-25ZP/ZK	MP-25ZK	PRSS0004AK-A	-	Taping	800	E1/E2
	TO-263/ MP-25ZP/ZK	TO-263	-	-	Taping	800	E1/E2(SP)
to be prepared	TO-220SMD/ MP-25Z/LDPAK(S)	LDPAK(S)-(1)	PRSS0004AE-B	SC-83	Taping	1000	TL/TR
	TO-220SMD/ MP-25Z/LDPAK(S)	LDPAK(S)-(1) (RJ part number+J3)	PRSS0004AE-B	SC-83	Taping	1000	J3
	TO-220SMD/ MP-25Z/LDPAK(S)	MP-25Z	PRSS0004AJ-B	-	Taping	1000	E1/E2
 (1.2x1.0x0.5)	6LLMM	6L2MM-1208	-	-	Taping	10000	T3
 (1.0x0.7x0.5)	3LLMM	3L2MM	-	-	Taping	10000	T3
 (4.4x4.2x0.9)	79A	79A	-	-	Taping	1000 5000	T1 T1B
 (20.3x5.8x4.2)	T-91M	T-91M(3M)	-	-	Tray	60	-
 (34.0x9.9x4.4)	T-97M	T-97M(3P)	-	-	Tray	30	-
 (41.2x10.2x5.0)	T-101M	T-101M(3S)	-	-	Tray	30	-
 (4.8x18.1)	SC51/TO-92MOD	TO-92MOD	PRSS0003DC-A	SC-51	Box	2500	Grade+TZ
	TO-92	TO-92(1)	PRSS0003DA-A	-	Box	2500	Grade+TZ
	TO-92	TO-92*	PRSS0003EA-A	SC-43	Box	2000	TB
	TO-251/ MP-3/DPAK(L)	DPAK(L)-(2)	PRSS0004ZD-B	-	Box(Tube)	2160	-
	TO-251/ MP-3/DPAK(L)	DPAK(L)-(1)	PRSS0004ZD-A	-	Box(Tube)	2160	-
 (8.0x29.5x4.5)	MP-10	MP-10	PRSS0003ZL-A	-	Taping	1000	T
 (5.7x5.4x1.5)	MP-2	MP-2	PLZZ0004ZA-A	SC-84	Taping	1000	T1/T2
 (8.5x25.0x2.8)	TO-126/MP-5	MP-5	PRSS0003ZK-A	-	Magazine	65	-
 (6.6x16.1x2.3)	TO-251/ MP-3/DPAK(L)	MP-3	PRSS0004ZM-A	SC-64	Bag stuffing	1000	-
	TO-262/MP-25SK/ LDPAK(L)	LDPAK(L)	PRSS0004AE-A	-	Box(Tube)	300	-
 (10.2x21.0)	TO-220FP/FL/FM/ MP-45	TO-220F	PRSS0003AA-A	SC-67	Tube	50	-
 (10.5x30.5)	TO-220FP/FL/FM/ MP-45	TO-220F(2)	PRSS0003AA-B	SC-67	Tube	50	-
 (10.5x30.5)	TO-220FP/FL/FM/ MP-45	MP-45F	PRSS0003AK-A	SC-67	Vinyl sack	100	-
 (10.0x28.5x4.5)	TO-220FP/FL/FM/ MP-45	MP-45F	PRSS0003AK-A	SC-67	Vinyl sack	100	-
	TO-220FP/FL/FM/ MP-45	TO-220FM	PRSS0003AD-A	SC-67	Magazine	50	-
 (10x31)	TO-220FP/FL/FM/ MP-45	TO-220FP	PRSS0003AG-A	-	Box(Tube)	600	-
 (10.16x28.85)	TO-220FP/FL/FM/ MP-45	TO-220FL	PRSS0003AF-A	-	Box(Tube)	1000	-
 (10.0x27.5)	TO-220FP/FL/FM/ MP-45	TO-220FL	PRSS0003AF-A	-	Box(Tube)	600	-
to be prepared	TO-220FP/FL/FM/ MP-45	Isolated TO-220	-	-	Tube	50	S17(SP)
	TO-220/AB/ MP-25/K	TO-220	PRSS0004AA-A	-	Tube	50	S19(SP)
 (10.5x28.5)	TO-220/AB/ MP-25/K	TO-220	PRSS0004AA-A	-	Tube	50	S19(SP)
 (11.5x29)	TO-220/AB/ MP-25/K	TO-220AB	PRSS0004AC-A	SC-46	Box(Tube)	600	-
 (10.0x28.8)	TO-220/AB/ MP-25/K	TO-220ABS	PRSS0004AG-A	SC-46	Magazine	50	-
 (10.0x28.2x4.8)	TO-220/AB/ MP-25/K	MP-25	PRSS0004AH-A	SC-46	Magazine	50	-
	TO-220/AB/ MP-25/K	MP-25K	PRSS0004AN-A	-	Magazine	50	-
to be prepared	TO-262/MP-25SK/ LDPAK(L)	TO-262	-	-	Tube	50	S23(SP)
 (10.0x29.6x4.45)	TO-262/MP-25SK/ LDPAK(L)	MP-25SK	PRSS0004AM-A	-	Magazine	50	-
 (10.0x23.8x4.45)	TO-263-7pin/ MP-25ZT	MP-25ZT	-	-	Taping	800	E1/E2
 (10.0x14.85x4.45)	TO-264	TO-264	PRSS0003ZC-A	-	-	-	-
	TO-3PFM/3PN	TO-3PFM	PRSS0003ZA-A	SC-93	Box(Tube)	360	-
	TO-3PFM/3PN	TO-3PN	-	-	-	-	-
 (20.0x46.0)	TO-3P/MP-88	MP-88	PRSS0004ZS-A	SC-65	Magazine	30	-
 (15.6x40.9)							
to be prepared							
 (15.7x39.5x4.7)							

Packages and Standard Taping Specifications

Package (Size WidthxLengthxHeight)	Normalized Name	Package Name	Renesas Code	JEITA Code	Packing Option	Packing Quantity	Packing Device Direction
 (15.6x37.9)	TO-3P/MP-88	TO-3P	PRSS0004ZE-A	SC-65	Box(Tube)	360	-
 (15.6x39.6)	TO-3PFM-5	TO-3PFM-5	PRSS0005ZB-A	SC-93	-	-	-
 (15.94x41.32)	TO-247	TO-247	PRSS0003ZE-A	-	-	-	-
 (15.6x34.9)	TO-3PSG	TO-3PSG	PRSS0004ZH-A	-	Box(Tube)	360	-
to be prepared	TO-247A	TO-247A	PRSS0003ZH-A	-	Box(Tube)	240	-
	DIP-4	4pin-DIP	-	-	Taping	2000 1000	F3 E3
	DIP-4(LF)	4pin-DIP(LF)	-	-	-	-	-
	DIP-4(LF-L1)	4pin-DIP(LF-L1)	-	-	-	-	-
 (4.6x6.5x3.5)	DIP-4(LF-L2)	4pin-DIP(LF-L2)	-	-	-	-	-
 (4.6x6.5x3.5)	DIP-6	6pin-DIP	-	-	Taping	1000	E3
 (4.6x6.5x3.5)	SDIP-6(LF)	6pin-SDIP(LF)	-	-	-	-	-
 (4.58x6.8x3.5)	SDIP-6(LF-L2)	6pin-SDIP(LF-L2)	-	-	-	-	-
to be prepared	SDIP-6	6pin-SDIP	-	-	Taping	2000	E3
	SDIP-8(LF)	8pin-SDIP(LF)	-	-	Taping	2000	E3
	SDIP-8(LF-L2)	8pin-SDIP(LF-L2)	-	-	Taping	2000	E3
 (4.6x6.5x3.5)	DIP-8	8pin-DIP	-	-	Taping	1000	E3
 (9.25x6.5x3.5)	DIP-8	8pin-DIP	-	-	Taping	1000	E3
 (9.25x6.5x3.5)	DIP-8(LF-L1)	8pin-DIP(LF-L1)	-	-	-	-	-
 (9.25x6.5x3.5)	DIP-8(LF-L2)	8pin-DIP(LF-L2)	-	-	Taping	1000	E3
 (9.25x6.5x3.5)	DIP-8(LF)	8pin-DIP(LF)	-	-	-	-	-
 (9.25x6.5x3.5)	DIP-8(LF-L4)	8pin-DIP(LF-L4)	-	-	-	-	-
 (19.8x6.5x3.5)	DIP-16	16pin-DIP	-	-	Magazine	30	-
 (20.32x7.62x8.58)	DIP-16	16pin-DIP	-	-	Magazine	30	-
 (19.8x6.5x3.5)	DIP-16(LF)	16pin-DIP(LF)	-	-	-	-	-
 (6.7x13.8x3.5)	LSDIP-8	8pin-LSDIP	-	-	Taping	1000	F3

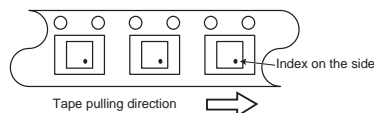
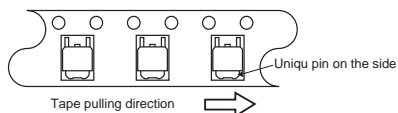
Packages and Standard Taping Specifications

Reference pin is defined as a pin closest to the index mark or a top left pin with setting index mark upper side of the device.



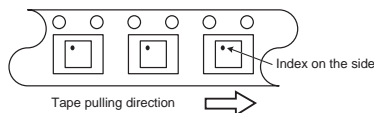
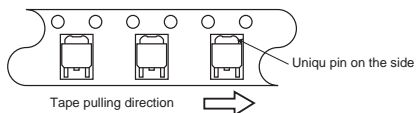
On condition of facing to the marking side of the device, the reference pin, that is indicated by unique pin or index mark, located on the right hand of the Tape pulling direction.

TR UR ER T2 E2 T2B



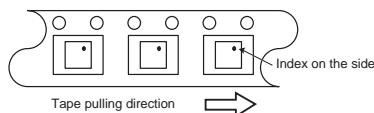
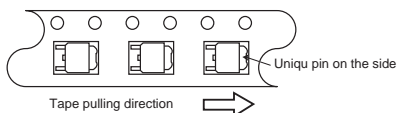
On condition of facing to the marking side of the device, the reference pin, that is indicated by unique pin or index mark, located on the left hand of the Tape pulling direction.

TL UL EL T1 E1 T1B



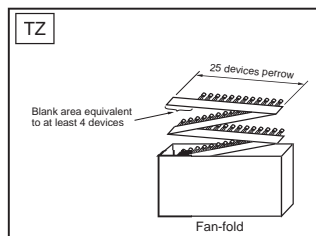
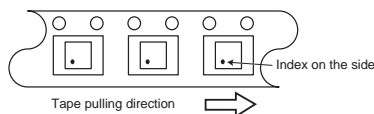
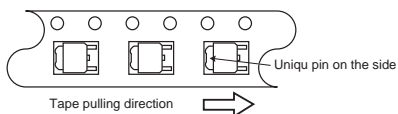
On condition of facing to the marking side of the device, the reference pin, that is indicated by unique pin or index mark, located on the same side of the Tape pulling direction.

T3



On condition of facing to the marking side of the device, the reference pin, that is indicated by unique pin or index mark, located on the against side of the Tape pulling direction.

E4



Index mark examples

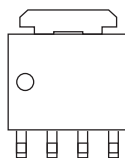
6pin MM



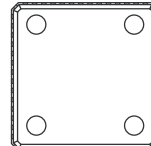
SOP-16



LFPK



TNP-56TV



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