Tr Product Catalog

2009-1st

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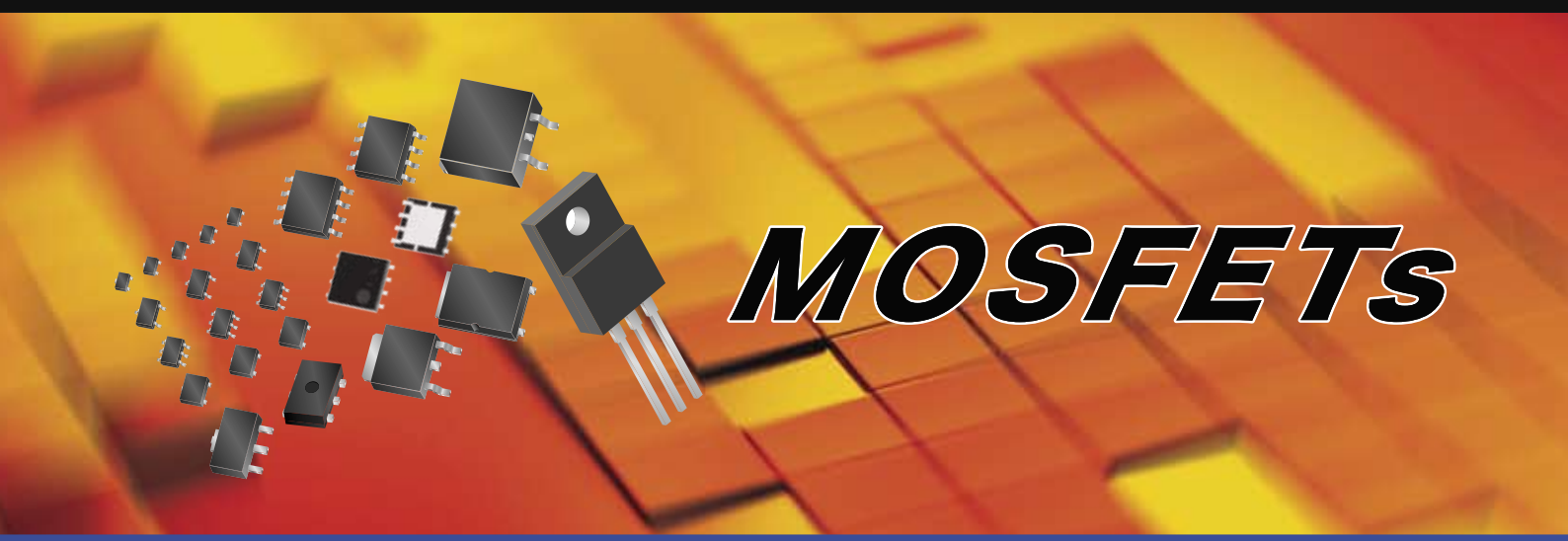

Discretes

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MOSFETs

Highlight

• ECOMOS™ Series

Portable equipment is increasingly shifting to low voltage drive.
This energy-saving series meets those needs.

• MPT6 Package Dual MOSFETs

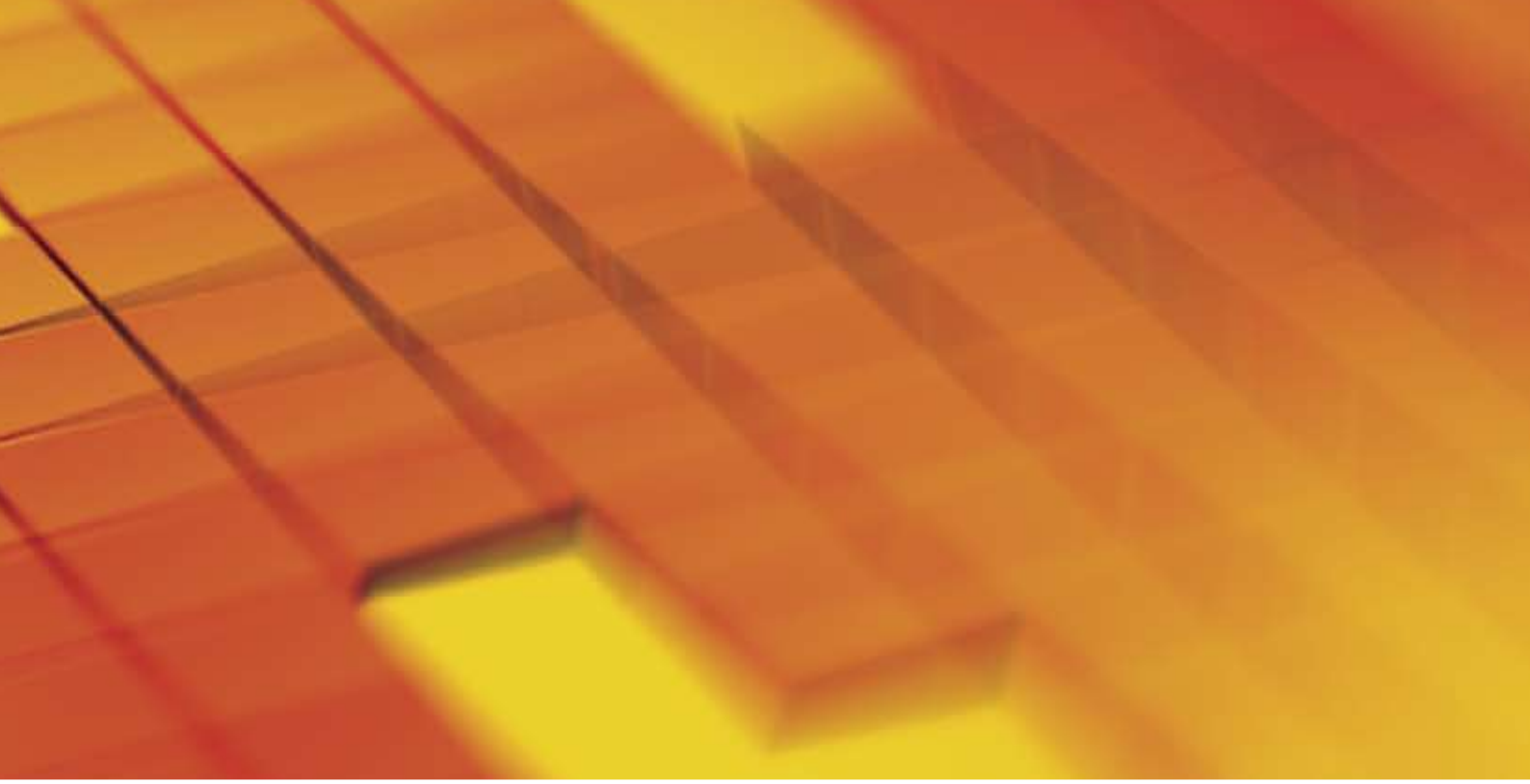
This high-power series features the same package power as conventional SOP8 units, but in a package 40% smaller.

• TCPT3 Package MOSFETs

High-power series ;
The same mounting space as the one for conventional CPT3 package : yet more current is applicable.

• High-speed Switching High Voltage Resistance MOSFETs

This high performance, high speed switching series reduces switching loss by 30% compared to conventional products. (500 to 600V)



CONTENTS

Highlight

Standard

Highlight MOSFET Lineup

ECOMOS™ Series

	Drive Voltage (V)	VDSS (V)	ID (A) 0.2 / 0.3	1 / 1.3	1.5 / 2	2.4 / 2.5	3 / 3.5	4 / 4.5	5 / 6 / 7	Package	Page
Single type	1.2	20	New RUM002N02(N)							VMT3	P.5
			New RZM002P02(P)								
			New RUE002N02(N)							EMT3	
			New RZE002P02(P)								
	1.5	12		New RZF013P01(P)	New RZF020P01(P)		RZF030P01(P)			TUMT3	
						New RZL025P01(P)	RZL035P01(P)			TUMT6	
					New RZR020P01(P)	New RZR025P01(P)		RZR040P01(P)		TSMT3	
				New RW1A013ZP(P)	New RW1A020ZP(P)					WEMT6	P.6
								New RZQ045P01(P)	RZQ050P01(P)	TSMT6	P.5
								New RT1A040ZP(P)	New RT1A050ZP(P)	TSST8	P.6
									New RQ1A060ZP(P)	TSMT8	
									New RQ1A070ZP(P)		
		20			New RUF020N02(N)	New RUF025N02(N)				TUMT3	P.5
							RUL035N02(N)			TUMT6	
					New RUR020N02(N)			New RUR040N02(N)		TSMT3	
									RUQ050N02(N)	TSMT6	
					New RW1C020UN(N)					WEMT6	P.6
	1.8		RUM003N02(N)							VMT3	P.5
			RUE003N02(N)							EMT3	
					RUF015N02(N)					TUMT3	
					New RW1C015UN(N)					WEMT6	P.6
Dual type	1.2	20	New EM6K7(N+N)							EMT6	P.5
			New EM6J1(P+P)								
			New EM6M2(P+N)								
	1.5	12		New US6J11(P+P)						TUMT6	
					New QS6J11(P+P)					TSMT6	
						New TT8J1(P+P)				TSST8	P.6
								New QS8J1(P+P)		TSMT8	
		20				New TT8J21(P+P)				TSST8	
	1.8		New EM6K6(N+N)							EMT6	P.5
					US6K4(N+N)					TUMT6	
	1.5 / 1.8	12 / 20		New US6M11(P+N)						TUMT6	
Built-in Diode	1.5	12		New ES6U1(P)						WEMT6	P.6
						QS5U36(N)				TSMT5	P.5
		20				New TT8U1(P)				TSST8	P.6
	1.8				New ES6U2(N)					WEMT6	

MPT6 Package Dual MOSFETs

	Drive Voltage (V)	VDSS (V)	ID (A)				Package	Page
			3.5	4.5	5	6		
Dual type	4	30	MP6K65(N+N)		MP6K61(N+N)	MP6K62(N+N)	MPT6	7
			MP6M62(P+N)	MP6M63(P)	MP6M63(N)			

TCPT3 Package MOSFETs

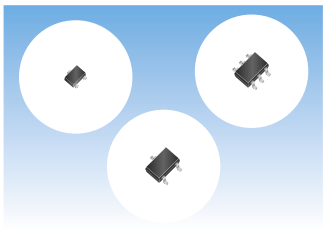
Drive Voltage (V)	VDSS (V)	ID (A)			Package	Page
		16	20	30		
4	40			RSY300N04(N)	TCPT3	8
	45	RSY160P05(P)	RSY200N05(N)			

High-speed Switching High Voltage Resistance MOSFETs

Drive Voltage (V)	VDSS (V)	ID (A)								Package	Page
		4 / 5	6 / 7	8 / 9	10 / 11	12 / 13	15 / 16	18 / 19	20 / 21 / 25		
10	400			New R4008AND(N)						CPT3	P.9
	500		R5007ANJ(N)	R5009ANJ(N)	New R5011ANJ(N)	New R5013ANJ(N)	R5016ANJ(N)	New R5019ANJ(N)	New R5021ANJ(N)	LPT	
		New R5005CNX(N)	R5007ANX(N)	R5009ANX(N)	New R5011ANX(N)	R5013ANX(N)	R5016ANX(N)	New R5019ANX(N)	New R5021ANX(N)	TO-220FM	
	525	New R5205CND(N)	New R5207AND(N)							CPT3	
	600	New R6004AND(N)	New R6006AND(N)								
						New R6012ANJ(N)	New R6015ANJ(N)	New R6018ANJ(N)	New R6020ANJ(N)	LPT	
				R6008ANX(N)	New R6010ANX(N)	R6012ANX(N)	New R6015ANX(N)	New R6018ANX(N)	R6020ANX(N)	TO-220FM	
									★R6025ANZ(N)	TO-3PF	

★: Under Development

ECOMOS™ Series ①



Features

Energy saving

Summary

The development of a new low voltage drive process has enabled operation at V_{GS} = 1.2V to 1.8V

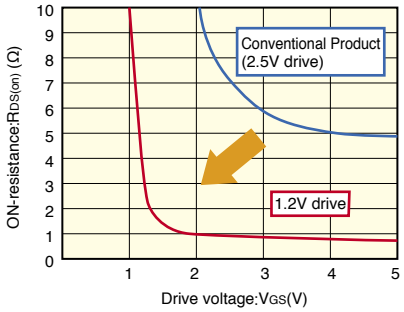
Applications

General load switch drives,
LED lamp drives,
Muting circuits,
DC/DC converters,
Switch for charger control,
and the like.

Stable low voltage drive

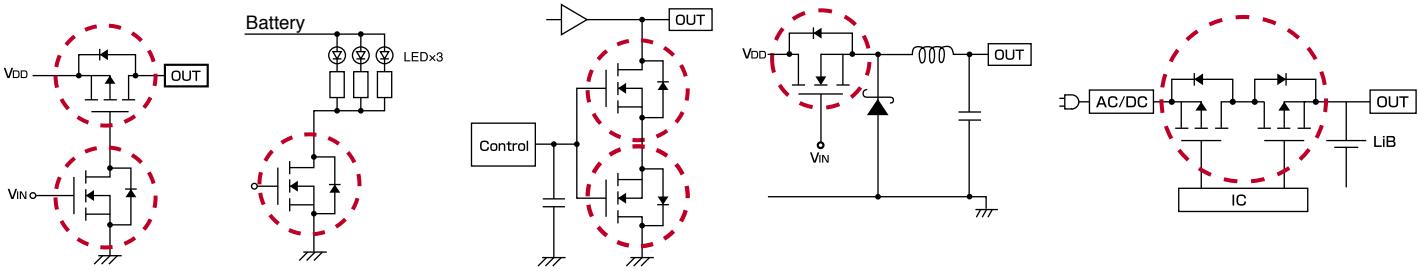
A new low-voltage drive process ensures stable operation at V_{GS} = 1.2V.
ON-resistance is also significantly reduced compared to conventional 2.5V products, resulting in 20 to 85% less power consumption when ON.

■ON-resistance comparison



Circuit example

●Load switch drive ●LED lamp driver ●Muting circuit ●DC/DC Converters ●Switch for charger control



Lineup

Package	PD(W)	Polarity	Part No.	VDSS (V)	ID (A)	RDS(on) Typ.(mΩ) VGS=1.5V	VGS=2.5V	VGS=4.5V	Drive Voltage (V)	Internal Circuitry
VMT3	0.15	Nch	New RUM002N02	20	0.2	1.6Ω*1	0.8Ω	0.1Ω	1.2	–
			RUM003N02	20	0.3	1Ω*2	0.8Ω	0.7Ω*3	1.8	–
		Pch	New RZM002P02	–20	–0.2	2.4Ω*1	1Ω	0.8Ω	1.2	–
EMT3	0.15	Nch	New RUE002N02	20	0.2	1.6Ω*1	0.8Ω	0.1Ω	1.2	–
			RUE003N02	20	0.3	1Ω*2	0.8Ω	0.7Ω	1.8	–
		Pch	New RZE002P02	–20	–0.2	2.4Ω*1	1Ω	0.8Ω	1.2	–
EMT6	0.15	Nch+Nch	New EM6K7	20	0.2	1.6Ω*1	0.8Ω	0.7Ω	1.2	⑨
			EM6K6	20	0.3	1Ω*2	0.8Ω	0.7Ω	1.8	⑨
		Pch+Pch	New EM6J1	–20	–0.2	2.4Ω*1	1Ω	0.8Ω	1.2	⑪
		Nch+Pch	New EM6M2	20	0.3	1.6Ω*1	0.8Ω	0.7Ω	1.2	⑩
				–20	–0.2	2.4Ω*1	1Ω	0.8Ω	1.2	
TUMT3	0.8	Nch	RUF015N02	20	1.5	220*2	170	130	1.8	–
			New RUF020N02	20	2	170	95	75	1.5	–
			RUF025N02	20	2.5	80	49	39	1.5	–
		Pch	New RZF013P01	–12	–1.3	530	280	190	1.5	–
			New RZF020P01	–12	–2	200	105	75	1.5	–
			RZF030P01	–12	–3	72	39	28	1.5	–

Package	PD(W)	Polarity	Part No.	VDSS (V)	ID (A)	RDS(on) Typ.(mΩ) VGS=1.5V	VGS=2.5V	VGS=4.5V	Drive Voltage (V)	Internal Circuitry
TUMT6	1	Nch	RUL035N02	20	3.5	66	38	31	1.5	–
		Pch	New RZL025P01	–12	–2.5	110	60	44	1.5	–
			RZL035P01	–12	–3.5	66	36	26	1.5	–
		Nch+Nch	US6K4	20	1.5	300	170	130	1.8	⑨
		Pch+Pch	New US6J11	–12	–1.3	530	280	190	1.5	⑪
		Nch+Pch	New US6M11	20	1.5	300	170	130	1.8	⑩
				–12	–1.3	530	280	190	1.5	
TSMT3	1	Nch	New RUR020N02	20	2	170	95	75	1.5	–
			RUR040N02	20	4	55	33	25	1.5	–
		Pch	New RZR020P01	–12	–2	200	105	75	1.5	–
			New RZR025P01	–12	–2.5	110	60	44	1.5	–
			RZR040P01	–12	–4	55	30	22	1.5	–
TSMT5	1.25	Nch+SBD(0.5A)	QS5U34	20	1.5	220*2	170	130	1.8	②
		Nch+SBD(0.7A)	QS5U36	20	2.5	120	74	58	1.5	②
TSMT6	1.25	Nch	RUQ050N02	20	5	40	27	22	1.5	–
		Pch	New RZQ045P01	–12	–4.5	50	31	25	1.5	–
			RZQ050P01	–12	–5	44	26	19	1.5	–
		Pch+Pch	New QS6J11	–12	–2	200	105	75	1.5	⑪

Note) Please see p.16 for the internal circuitry

*1 VGS=1.2V *2 VGS=1.8V *3 VGS=4V

ECOMOS™ Series ②

WEMT6 / TSST8 / TSMT8 Package

Features

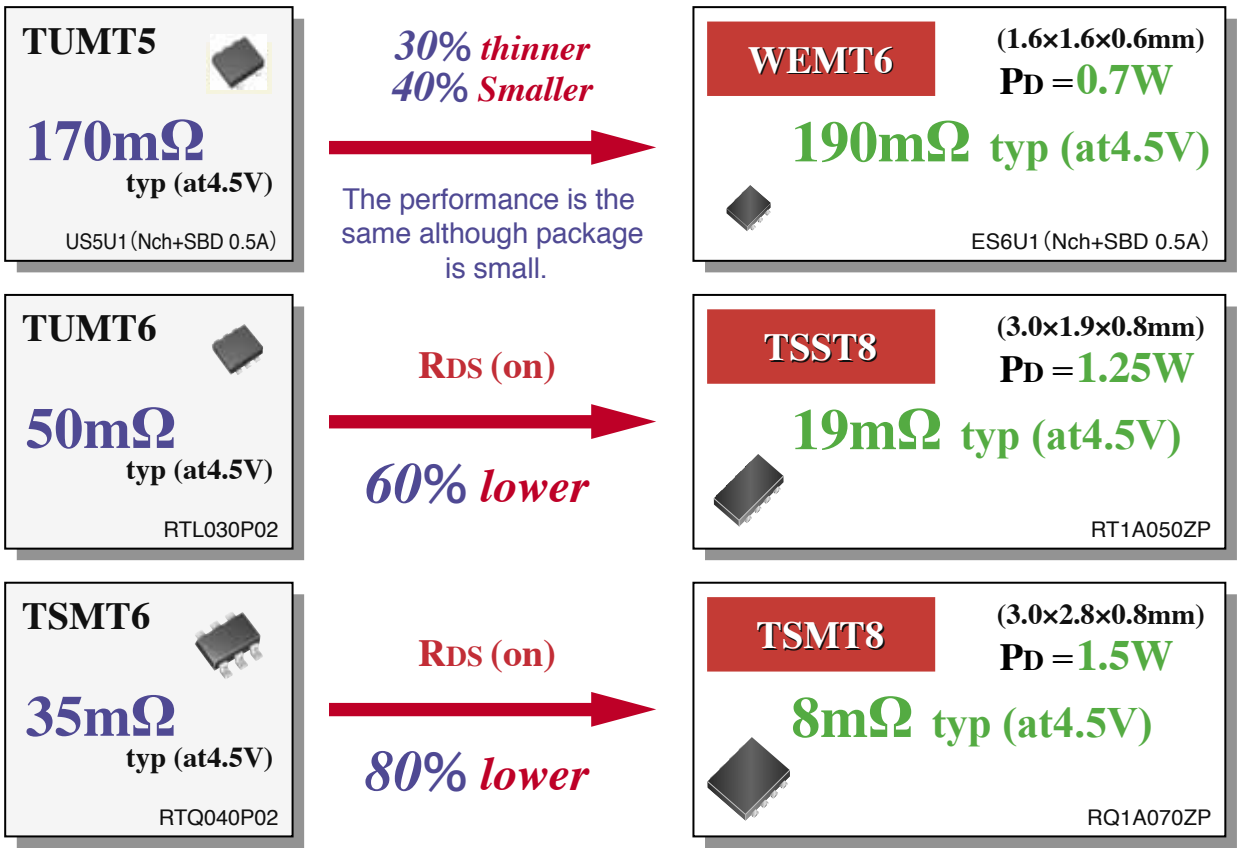
- Low ON-resistance more than conventional products
- Thin and small packages
- Matching to a highly effective, high density mounting.

Advantage

- Small and high-power
- Low ON-resistance compared with conventional products

Benefit

- Energy saving
- Space saving



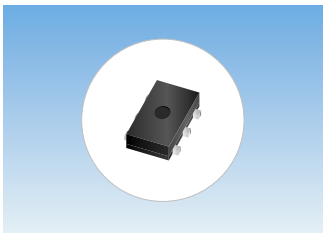
Lineup

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ)				Drive Voltage (V)	Internal Circuitry
						VGS=1.5V	VGS=1.8V	VGS=2.5V	VGS=4.5V		
WEMT6	0.7	Nch	New RW1C015UN	20	1.5	300	220	170	130	1.8	–
			New RW1C020UN	20	2	170	–	95	75	1.5	–
		Nch+SBD(0.5A)	New ES6U2	20	1.5	300	220	170	130	1.8	②
		Pch	New RW1A013ZP	–12	–1.3	530	–	280	190	1.5	–
			New RW1A020ZP	–12	–2	200	–	105	75	1.5	–
		Pch+SBD(0.5A)	New ES6U1	–12	–1	530	–	280	190	1.5	②
TSST8	1.25	Pch	New RT1A040ZP	–12	–4	55	–	30	22	1.5	–
			New RT1A050ZP	–12	–5	48	–	26	19	1.5	–
		Pch+Pch	TT8J1	–12	–2.5	110	–	60	44	1.5	⑫
			TT8J21	–20	–2.5	140	100	68	49	1.5	⑫
		Pch+SBD(1A)	TT8U1	–20	–2.4	180	150	105	80	1.5	⑧
TSMT8	1.5	Pch	New RQ1A060ZP	–12	–6	39	–	22	16	1.5	–
			New RQ1A070ZP	–12	–7	19	–	11	8	1.5	–
		Pch+Pch	New QS8J1	–12	–4.5	48	–	28	21	1.5	⑫

Note) Please see p.16 for the internal circuitry

MPT6 Package Dual MOSFETs

MP6K, MP6M Series



Features

High power
Space saving
High performance

Summary

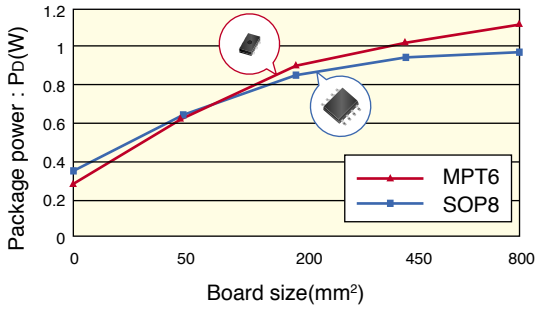
The frame pattern was optimized to create a compact package requiring 40% less mounting area while delivering the same package power as the conventional SOP8.

Applications

DC/DC Converters,
Motor drive circuit,
Amusement equipment

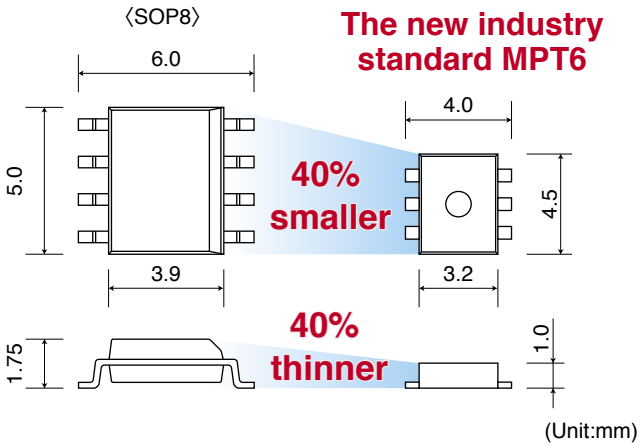
Excellent package power

Provides the same package power as the SOP8 (5060 size) in the 4540 size.



Space-saving, Thin, Low ON-resistance

Delivers the same low ON-resistance as the SOP8 (5060 size) in a package 40% smaller and 40% thinner.

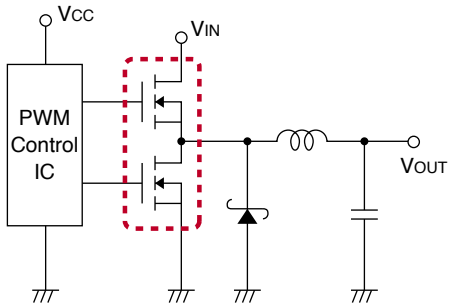


Outline

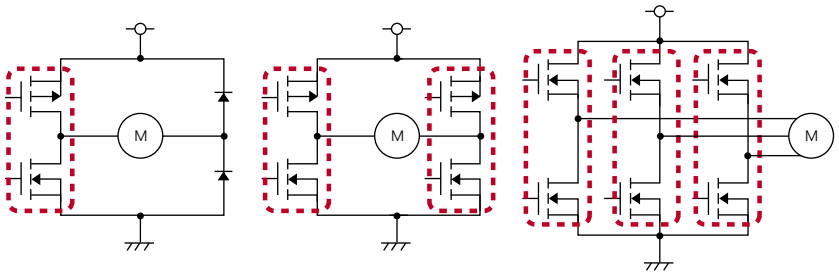
Front side　　Back side

Circuit example

●DC/DC Converters



●Motor drive circuit



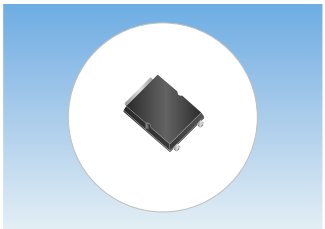
〈Half bridge〉　〈Full bridge〉　〈3-Phase motor control〉

Lineup

Package	PD(W)	Polarity	品名	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ) VGS=4V	RDS(on) Typ.(mΩ) VGS=4.5V	RDS(on) Typ.(mΩ) VGS=10V	Qg(nC) VGS=5V	Internal Cuircuitry
MPT6	2.0	Nch+Nch	**MP6K65**	30	3.5	105	95	73	2	⑨
			MP6K61	30	5	55	50	36	4	
			MP6K62	30	6	33	30	24	7.6	
		Nch+Pch	**MP6M63**	30	5	55	50	36	4	⑩
				–30	–4.5	60	55	40	8.4	
			MP6M62	30	3.5	107	93	63	2	
				–30	–3.5	110	100	70	4.6	

Note) Please see p.16 for the internal circuitry

TCPT3 Packge MOSFETs



Features

Thin
High power

Summary

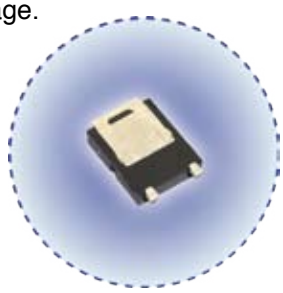
The same mounting space as the one for conventional CPT3 package : yet more current is applicable.

Applications

LCD backlight inverters
Motor drive circuit

High power, Thin

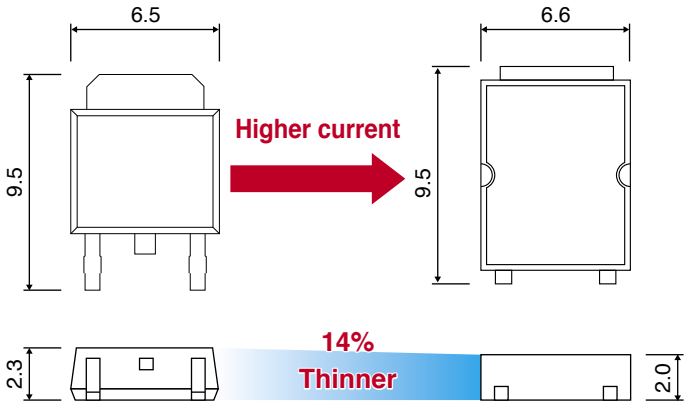
Improvement of heat-radiation efficiency has enabled higher current intake with the same mounting space as the one for conventional CPT3 package.



TCPT3 (Back side)

〈CPT3〉 〈TCPT3〉

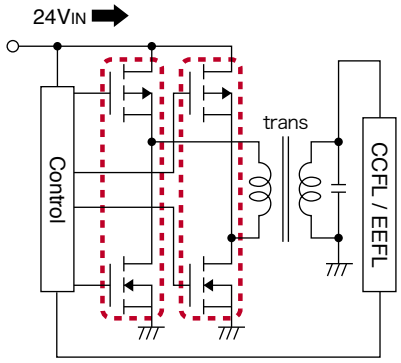
(Unit:mm)



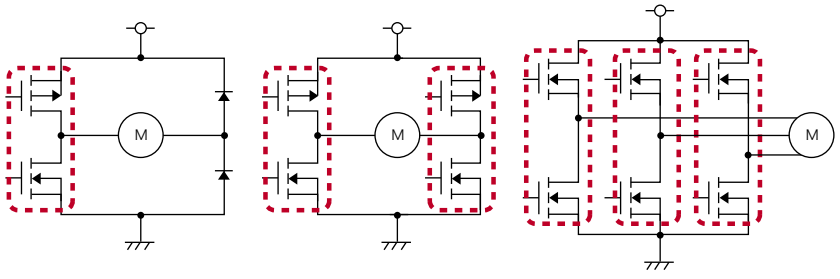
Circuit example

Controlling heat emission is a major challenge with large LCDs. The high power TCPT3 package helps reduce heat dissipation in the backlight inverter circuit.

● LCD backlight inverter circuit



● Motor drive circuit

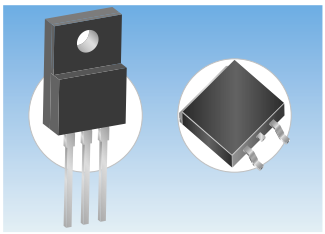


<Half bridge> <Full bridge> <3-Phase motor control>

Lineup

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ)			Qg(nC)
						VGS=4V	VGS=4.5V	VGS=10V	VGS=5V
TCPT3	20	Nch	**RSY300N04**	40	30	11	10	8	24
			RSY200N05	45	20	28	25	20	12
		Pch	**RSY160P05**	–45	–16	50	45	35	17

High-speed Switching High Voltage Resistance MOSFETs



Features

High power
Energy saving
High performance

Summary

This high-performance series was developed using a new high voltage resistance process that enables fast switching and low ON-resistance.

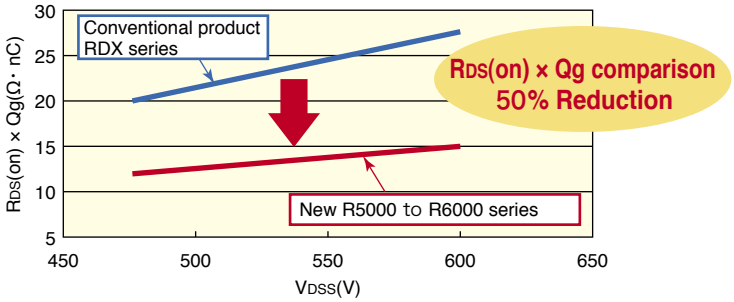
Applications

Switching power supplies
Lighting

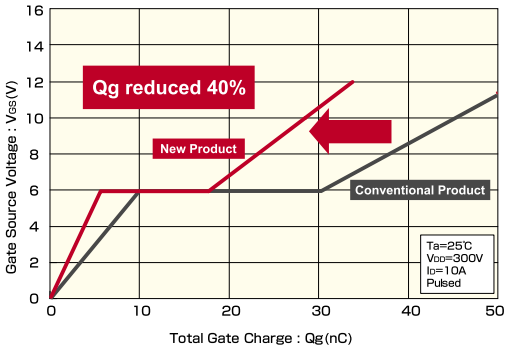
High-speed switching (Low switching loss)

A new low ON-resistance process reduces ON-resistance by 50% over conventional units, significantly improving switching speed (by 30%) while reducing switching loss. The lineup is available in two different power packages, TO-220FM and LPT, featuring lower heat emission.

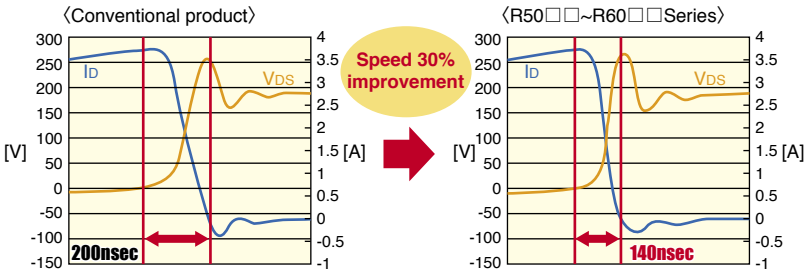
■RDS(on) × Qg comparison



■Qg comparison



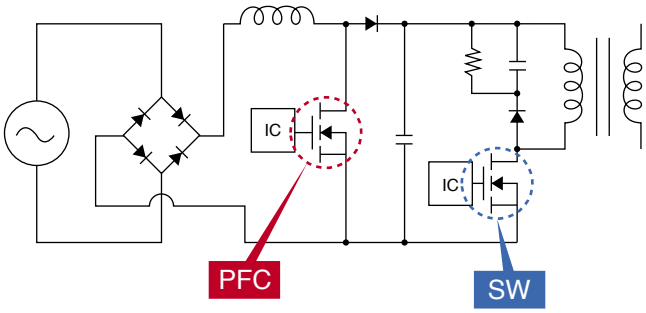
■Switching speed comparison



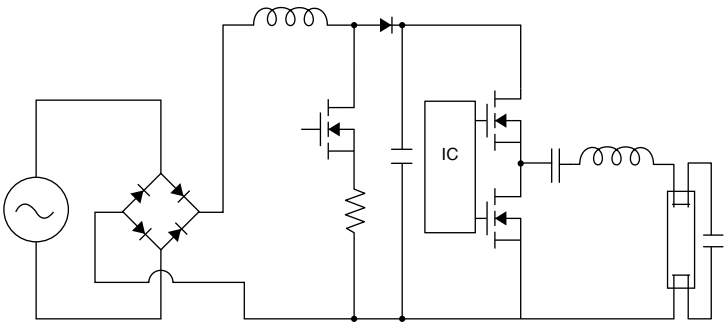
Circuit example

Ideal for use in the PFC block, requiring low ON-resistance, and in switching (SW) circuits in the switching power supply, where switching speed is of critical importance. Also, it is suitable also for the ballast circuit of the lighting.

■Switching power supply circuit (Primary)



■Ballast circuit



Lineup

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(Ω) VGS=10V	Qg(nC) VGS=10V
CPT3	40	Nch	New R4008AND	400	8	0.73	15
			New R5205CND	525	5	1.3	9.5
			New R5207AND	525	7	0.78	13
			New R6004AND	600	4	1.5	10
			New R6006AND	600	6	0.9	15
LPT	40	Nch	R5007ANJ	500	7	0.8	13
	50	Nch	R5009ANJ	500	9	0.55	21
	75	Nch	New R5011ANJ	500	11	0.38	30
	100	Nch	New R5013ANJ	500	13	0.29	35
			R5016ANJ	500	16	0.21	50
			New R5019ANJ	500	19	0.18	52
			New R5021ANJ	500	21	0.17	64
			New R6012ANJ	600	12	0.32	35
			New R6015ANJ	600	15	0.23	60
			New R6018ANJ	600	18	0.21	53
			New R6020ANJ	600	20	0.19	65
TO-220FM	40	Nch	R5007ANX	500	7	0.8	13
	50	Nch	New R5005CNX	500	5	1.3	9.5
			R5009ANX	500	9	0.55	21
			New R5011ANX	500	11	0.38	30
			R5013ANX	500	13	0.29	35
			R5016ANX	500	16	0.21	50
			New R5019ANX	500	19	0.18	52
			New R5021ANX	500	21	0.16	64
			R6008ANX	600	8	0.6	21
			New R6010ANX	600	10	0.43	25
			New R6012ANX	600	12	0.32	35
			New R6015ANX	600	15	0.23	50
			New R6018ANX	600	18	0.21	53
			New R6020ANX	600	20	0.17	65
TO-3PF	200	Nch	★ R6025ANZ	600	25	0.12	85

★: Under Development

Standard MOSFET Lineup

Small signal MOSFETs

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(Ω)			
						VGS=2.5V	VGS=4V	VGS=4.5V	VGS=10V
VMT3	0.15	Nch	**2SK3541**	30	0.1	7	5	–	–
		Pch	**RTM002P02**	–20	–0.2	2.0	1.1	1.0	–
			RSM002P03	–30	–0.2	–	1.6	1.4	0.9
EMT3	0.15	Nch	**2SK3019**	30	0.1	7	5	–	–
		Pch	**RTE002P02**	–20	–0.2	2.0	1.1	1.0	–
			RSE002P03	–30	–0.2	–	1.6	1.4	0.9
EMT5	0.15	Nch+Nch	**EM5K5**	30	0.3	0.8	0.7	0.6	–
EMT6	0.15	Nch+Nch	**EM6K1**	30	0.1	7	5	–	–
		Nch+Pch	**EM6M1**	30	0.1	7	5	–	–
				–20	–0.2	2	1.1	1	–
UMT3	0.2	Nch	**2SK3018**	30	0.1	7	5	–	–
			RJU003N03	30	0.3	1.4	0.9	0.8	–
			RHU003N03	30	0.3	–	1.4	1.2	0.8
			RJU002N06	60	0.2	2.2	1.7	1.6	–
			RHU002N06	60	0.2	–	2.8	–	1.7
		Pch	**RTU002P02**	–20	–0.25	2.0	1.1	1.0	–
			RSU002P03	–30	–0.25	–	1.6	1.4	0.9
UMT5	0.15	Nch+Nch	**UM5K1N**	30	0.1	7	5	–	–
UMT6	0.15	Nch+Nch	**UM6K1N**	30	0.1	7	5	–	–
		Pch+Pch	New **UM6J1N**	–30	–0.2	–	1.6	1.4	0.9
SST3	0.2	Nch	**RK7002**	60	0.115	–	–	7.5 max.*	7.5 max.
			RK7002A	60	0.3	–	1.1	–	0.7
SMT3	0.2	Nch	**2SK2731**	30	0.2	–	2.8	–	1.5
			RJK005N03	30	0.5	0.65	0.42	0.40	–
			RHK005N03	30	0.5	–	0.6	0.51	0.35
			RHK003N06	60	0.3	–	1.1	–	0.7
SMT6	0.2	Nch+Nch	**SM6K2**	60	0.2	–	2.8	–	1.7

* VGS=5V

Middle Power MOSFETs

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ)				Qg(nC)
						VGS=2.5V	VGS=4V	VGS=4.5V	VGS=10V	VGS=4.5V
WEMT6	0.7	Nch	New RW1E014SN	30	1.4	–	270	250	170	1.4 *
		Nch+SBD(0.5A)	New ES6U3	30	1.4	–	270	250	170	1.4 *
TUMT3	0.8	Nch	RTF015N03	30	1.5	240	180	170	–	1.6
			RTF025N03	30	2.5	70	50	48	–	3.7
			RSF014N03	30	1.4	–	270	250	170	1.4 *
		Pch	RTF010P02	–20	–1	570	310	280	–	2.1
			RTF015P02	–20	–1.5	180	110	100	–	5.2
			RTF020P02	–20	–2	120	65	60	–	7
			RSF010P03	–30	–1	–	450	400	250	1.9 *
TUMT5	1	Nch+SBD(0.7A)	US5U3	30	1.5	240	180	170	–	1.6
		Nch+SBD(0.5A)	US5U1	30	1.5	240	180	170	–	1.6
			US5U2	30	1.4	–	270	250	170	1.4 *
		Pch+SBD(0.5A)	US5U30	–20	–1	570	310	280	–	2.1
		Pch+SBD(0.7A)	US5U38	–20	–1	570	310	280	–	2.1
		Pch+SBD(0.1A)	US5U35	–45	–0.7	–	1000	900	600	1.7 *
TUMT6	1	Nch	RTL035N03	30	3.5	56	42	40	–	4.6
		Nch+Nch	US6K1	30	1.5	240	180	170	–	1.6
			US6K2	30	1.4	–	270	250	170	1.4 *
		Nch+SBD(0.7A)	US6U37	30	1.5	240	180	170	–	1.6
		Pch	RTL020P02	–20	–2	180	110	100	–	4.9
			RTL030P02	–20	–3	90	55	50	–	8
			RSL020P03	–30	–2	–	140	125	80	3.9 *
		Pch+Pch	US6J2	–20	–1	570	310	280	–	2.1
		Nch+Pch	US6M2	30	1.5	240	180	170	–	1.6
				–20	–1	570	310	280	–	2.1
			US6M1	30	1.4	–	270	250	170	1.4 *
				–20	1	570	310	280	–	2.1
TSMT3	1	Nch	RTR025N03	30	2.5	95	70	66	–	3.3
			RTR040N03	30	4	47	36	34	–	5.9
			New RRR035N03	30	3.5	–	65	60	45	4.5 *
			RSR025N03	30	2.5	–	83	74	50	2.9 *
			New RTR030N05	45	3	68	53	48	–	6.2
			New RTR025N05	45	2.5	125	100	95	–	3.2
			RTR020N05	45	2	180	135	130	–	2.9
			New RSR030N06	60	3	–	75	70	60	5 *
			New RSR020N06	60	2	–	150	140	120	2.7 *
		Pch	RTR011P02	–20	–1.1	570	310	280	–	2
			RTR020P02	–20	–2	180	110	100	–	4.9
			RTR025P02	–20	–2.5	115	75	70	–	7
			RTR030P02	–20	–3	90	60	55	–	9.3
			New RRR030P03	–30	–3	–	95	85	55	5.2 *
			RSR025P03	–30	–2.5	–	115	100	70	5.4 *
			RSR020P03	–30	–2	–	150	135	85	4.3 *
			RSR015P03	–30	–1.5	–	320	270	170	2.6 *
TSST8	1.25	Pch+Pch	New TT8J2	–30	–2.5	–	115	95	60	4.8 *
		Nch+Nch	New TT8K2	30	2.5	95	70	65	–	3.2
		Pch+Nch	New TT8M2	30	2.5	95	70	65	–	3.2
				–20	–2.5	68	–	49	–	12
TSMT5	1.25	Nch+Nch	QS5K2	30	2	110	76	71	–	2.8
		Nch+SBD(1A)	QS5U12 *3	30	2	110	76	71	–	2.8
			QS5U17 *3	30	2	110	76	71	–	2.8
		Nch+SBD(0.5A)	QS5U13 *4	30	2	110	76	71	–	2.8
			QS5U16 *4	30	2	110	76	71	–	2.8
		Pch+SBD(1A)	QS5U28	–20	–2	175	97	90	–	4.8
			QS5U21 *5	–20	–1.5	260	180	160	–	4.2
			QS5U27 *5	–20	–1.5	260	180	160	–	4.2
			QS5U33	–30	–2	–	160	145	95	3.4 *
		Pch+SBD(0.5A)	QS5U23 *6	–20	–1.5	260	180	160	–	4.2
			QS5U26 *6	–20	–1.5	260	180	160	–	4.2

*3,4,5,6：Please note that, although the internal circuit configuration may differ between part numbers, the electrical specifications remain the same.

*VGS=5V

Middle Power MOSFETs

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ) VGS=2.5V	RDS(on) Typ.(mΩ) VGS=4V	RDS(on) Typ.(mΩ) VGS=4.5V	RDS(on) Typ.(mΩ) VGS=10V	Qg(nC) VGS=4.5V
TSMT6	1.25	Nch	RTQ020N03	30	2	138	94	89	–	2.4
			RTQ035N03	30	3.5	55	40	38	–	4.6
			RTQ045N03	30	4.5	42	32	30	–	7.6
			RSQ045N03	30	4.5	–	40	36	27	6.8 *
			New RRQ035N03	30	3.5	–	65	60	45	4.5 *
			RSQ035N03	30	3.5	–	67	60	44	5.3 *
			RSQ020N03	30	2	–	168	148	96	2.2 *
			New RTQ020N05	45	2	200	150	140	–	2.3
			RVQ040N05	45	4	–	53	47	38	6.3
			New RSQ015N06	60	1.5	–	255	240	210	2 *
		Nch+Nch	QS6K1	30	1	260	180	170	–	1.7
		Pch	RTQ025P02	–20	–2.5	140	80	72	–	6.4
			RTQ030P02	–20	–3	110	65	60	–	9
			RTQ035P02	–20	–3.5	80	55	50	–	10.5
			RTQ040P02	–20	–4	60	40	35	–	12.2
			RSQ025P03	–30	–2.5	–	145	120	80	4.4 *
			New RRQ030P03	–30	–3	–	95	85	55	5.2 *
			RSQ030P03	–30	–3	–	100	90	60	6 *
			RSQ035P03	–30	–3.5	–	70	65	45	9.2 *
		Pch+Pch	QS6J1	–20	–1.5	310	170	155	–	3
			QS6J3	–20	–1.5	310	170	155	–	3
		Nch+Pch	QS6M3	30	1.5	260	180	170	–	1.6
				–20	–1.5	310	170	155	–	3
			QS6M4	30	1.5	260	180	170	–	1.6
				–20	–1.5	310	170	155	–	3
		Pch+SBD(0.5A)	QS6U22	–20	–1.5	310	170	155	–	3
			QS6U24	–30	–1	–	600	500	300	1.7 *
MPT3	*1 2.0	Nch	RHP030N03	30	3	–	160	–	90	–
			RJP020N06	60	2	210	170	165	–	–
			RHP020N06	60	2	–	240	200	150	–

*1: When mounted on a ceramic board (40×40×0.7mm).

*VGS=5V

Middle Power MOSFETs〈SOP8〉

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ) VGS=4V	RDS(on) Typ.(mΩ) VGS=4.5V	RDS(on) Typ.(mΩ) VGS=10V	Qg(nC) VGS=5V
SOP8	2.0	Nch	RRS070N03	30	7	28	26	20	7.7
			RRS090N03	30	9	18	17	14	12
			RRS100N03	30	10	15	14	11	16
			RRS110N03	30	11	11.5	11	9	22
			RRS125N03	30	12.5	9.8	9.2	7.5	27
			RRS130N03	30	13	9	8.5	7	30
			RRS150N03	30	15	7	6.5	5.5	38
			RRS180N03	30	18	4.8	4.5	3.8	63
			RSS070N05	45	7	25	23	18	12
			RSS080N05	45	8	20	18	15	13
			RSS085N05	45	8.5	18	16	13	15.3
			RSS095N05	45	9.5	15	14	11	18.9
			RSS065N06	60	6.5	31	28	24	11
		Nch+Nch	SP8K5	30	3.5	107	93	59	2.5
			SP8K1	30	5	58	52	36	3.9
			New SP8K62	30	6	33	30	24	7.6
			SP8K63	30	7	27	25	20	8.5
			SP8K64	30	9	18	17	14	15
			SP8K67	30	11	13.4	12.8	11	27
			SP8K22	45	4.5	46	41	33	6.8
			SP8K23	45	5	36	33	26	8.6
			SP8K24	45	6	26	24	18	15.4
			SP8K31	60	3.5	105	100	85	3.7
			SP8K32	60	4.5	55	52	46	7
			SP8K33	60	5	40	38	34	8
		Nch+Nch+SBD	SP8K10S	30	7	25	23	17	8.4
				30	8.5	19	17.8	14	8.9

Middle Power MOSFETs〈SOP8〉

Package	PD(W)	polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(mΩ)			Qg(nC)
						VGS=4V	VGS=4.5V	VGS=10V	VGS=5V
SOP8	2.0	Pch	**RRS040P03**	–30	–4	95	85	55	5.2
			RRS050P03	–30	–5	58	52	36	9.2
			RRS075P03	–30	–7.5	25	22	15	21
			RRS090P03	–30	–9	17	15	11	30
			RRS100P03	–30	–10	14	12.5	9	39
			RRS140P03	–30	–14	7.3	6.7	5	80
			RSS060P05	–45	–6	38	35	26	23
			RSS070P05	–45	–7	28	25	19	34
		Pch+Pch	**SP8J4**	–30	–2	320	270	170	2.4
			SP8J3	–30	–3.5	120	100	65	5.5
			SP8J1	–30	–5	45	40	30	16
			SP8J62	–30	–4.5	60	55	40	8
			SP8J65	–30	–7	31	29	21.5	18
			SP8J66	–30	–9	19	17.5	13.5	35
		Nch+Pch	**SP8M2**	30	3.5	107	93	59	2.5
				–30	–3.5	120	100	65	5.5
			SP8M6	30	5	58	52	36	3.9
				–30	–3.5	120	100	65	5.5
			SP8M8	30	6	33	30	21	7.2
				–30	–4.5	65	57	40	8.5
			SP8M10	30	7	25	23	17	8.4
				–30	–4.5	65	57	40	8.5
			SP8M63	30	5	55	50	36	4
				–30	–4.5	60	55	40	8
			SP8M64	30	9	18	17	14	15
				–30	–7	31	29	21.5	18
			SP8M65	30	6	33	30	24	7.6
				–30	–7	31	29	21.5	18
			SP8M21	45	6	26	24	18	15.4
				–45	–4	47	43	33	20
			SP8M24	45	4.5	46	41	33	6.8
				–45	–3.5	66	60	45	13
			SP8M41	80	3.4	120	110	90	6.6
				–80	–2.6	230	220	165	8.2
			SP8M70	250	3	–	–	1.25Ω	5.2 *
				–250	–2.5	–	–	2.2Ω	8 *

* VGS=10V

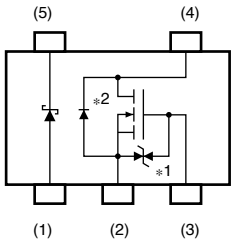
Power MOSFETs〈CPT3, TO-220FN, TO-220FM〉

Package	PD(W)	Polarity	Part No.	VDSS(V)	ID(A)	RDS(on) Typ.(Ω)	
						VGS=4V	VGS=10V
CPT3	10	Nch	**2SK2094**	60	2	0.4	0.3
	20	Nch	New **RSD220N06**	60	22	0.03	0.022
		Nch	**RSD200N10**	100	20	0.045	0.041
		Nch	**RDD050N20**	200	5	–	0.55
TO-220FN	30	Nch	**RDN050N20**	200	5	–	0.55
	35	Nch	**RDN100N20**	200	10	–	0.27
	40	Nch	**RDN150N20**	200	15	–	0.12
	35	Nch	**RDN080N25**	250	8	–	0.38
	40	Nch	**RDN120N25**	250	12	–	0.16
TO-220FM	35	Nch	**RDX050N50**	500	5	–	1.1
	40	Nch	**RDX080N50**	500	8	–	0.65
	45	Nch	**RDX120N50**	500	12	–	0.38
	30	Nch	**RDX030N60**	600	3	–	2.7
	35	Nch	**RDX045N60**	600	4.5	–	1.6
	40	Nch	**RDX060N60**	600	6	–	0.9
	45	Nch	**RDX100N60**	600	10	–	0.48

Internal Circuitry

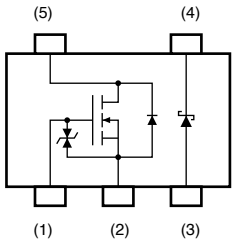
■MOSFET + SBD

①Nch+SBD (A)



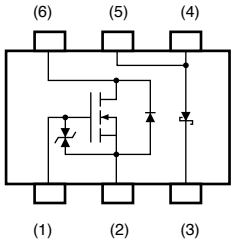
(1)Anode
(2)Source
(3)Gate
(4)Drain
(5)Cathode

②Nch+SBD (B)



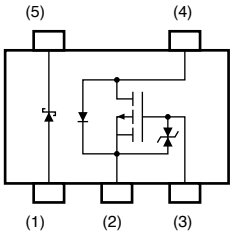
(1)Gate
(2)Source
(3)Anode
(4)Cathode
(5)Drain

③Nch+SBD (C)



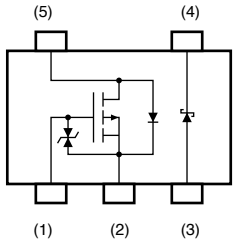
(1)Gate
(2)Source
(3)Cathode
(4)Anode
(5)Anode
(6)Drain

④Pch+SBD (A)



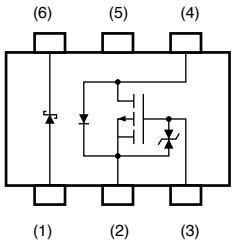
(1)Anode
(2)Source
(3)Gate
(4)Drain
(5)Cathode

⑤Pch+SBD (B)



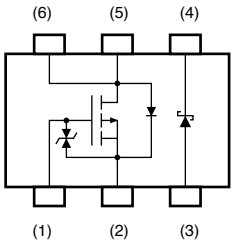
(1)Gate
(2)Source
(3)Anode
(4)Cathode
(5)Drain

⑥Pch+SBD (C)



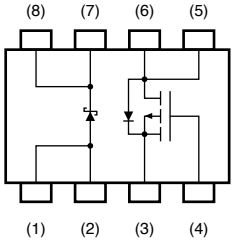
(1)Anode
(2)Source
(3)Gate
(4)Drain
(5)N/C
(6)Cathode

⑦Pch+SBD



(1)TR1:Gate
(2)TR1:Source
(3)SBD:Anode
(4)SBD:Cathode
(5)TR1:Drain
(6)TR1:Drain

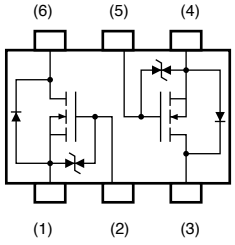
⑧Pch+SBD (D)



(1)Anode
(2)Anode
(3)Source
(4)Gate
(5)Drain
(6)Drain
(7)Cathode
(8)Cathode

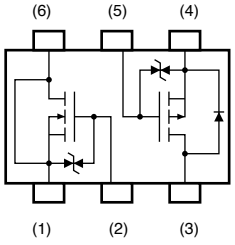
■MOSFET Dual

⑨Nch+Nch



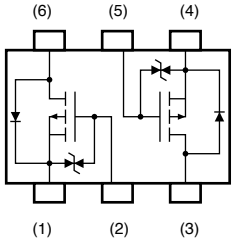
(1)TR1: Source
(2)TR1: Gate
(3)TR2: Drain
(4)TR2: Source
(5)TR2: Gate
(6)TR1: Drain

⑩Nch+Pch



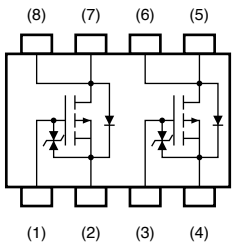
(1)TR1: Source
(2)TR1: Gate
(3)TR2: Drain
(4)TR2: Source
(5)TR2: Gate
(6)TR1: Drain

⑪Pch+Pch (A)



(1)TR1: Source
(2)TR1: Gate
(3)TR2: Drain
(4)TR2: Source
(5)TR2: Gate
(6)TR1: Drain

⑫Pch+Pch (B)



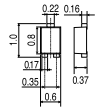
(1)TR1: Gate
(2)TR1: Source
(3)TR2: Gate
(4)TR2: Source
(5)TR2: Drain
(6)TR2: Drain
(7)TR1: Drain
(8)TR1: Drain

Dimensions

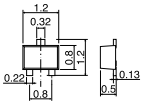
(Unit : mm)

Surface Mount Type

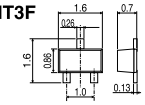
VMN3



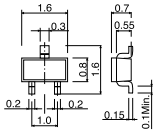
VMT3



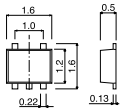
EMT3F



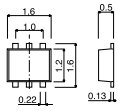
EMT3
(SC-75A)
〈SOT-416〉



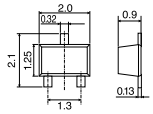
EMT5



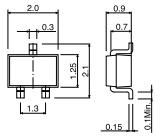
EMT6



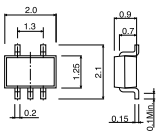
UMT3F



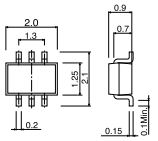
UMT3
(SC-70)
〈SOT-323〉



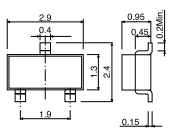
UMT5
(SC-88A)
〈SOT-353〉



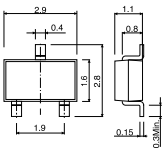
UMT6
(SC-88)
〈SOT-363〉



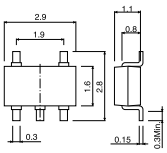
SST3
〈SOT-23〉



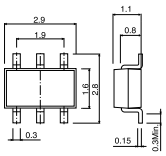
SMT3
(SC-59)
〈SOT-346〉



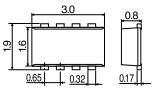
SMT5
(SC-74A)



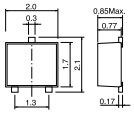
SMT6
(SC-74)
〈SOT-457〉



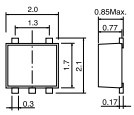
TSST8



TUMT3



TUMT5



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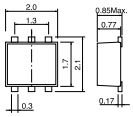
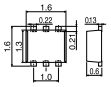
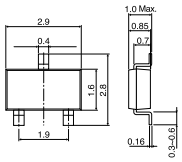


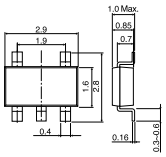
WEMT6



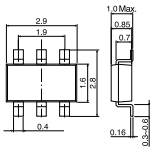
TSMT3



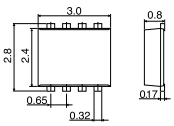
TSMT5



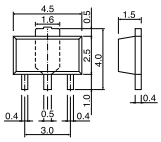
TSMT6



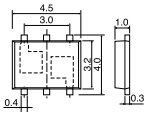
TSMT8



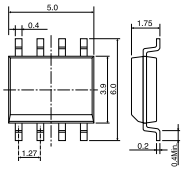
MPT3
(SC-62)
〈SOT-89〉



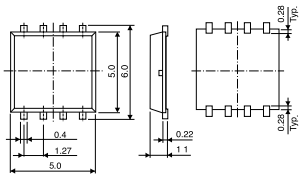
MPT6



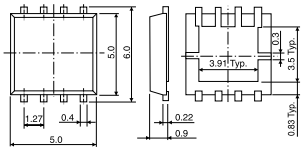
SOP8



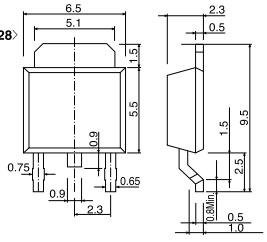
PSOP8S



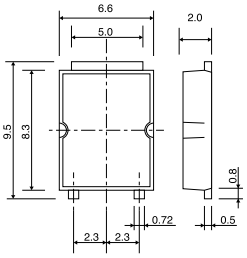
PSOP8



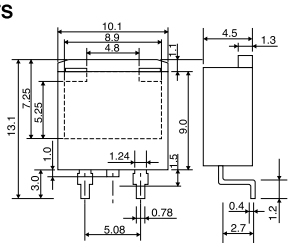
CPT3
(SC-63)
〈SOT-428〉



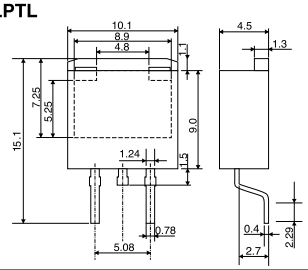
TCPT



LPTS



LPTL

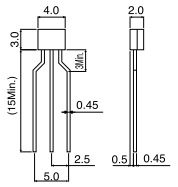


Notes: 1) Characters in ( ) under package designation denotes JEITA No. Characters in < > under package designation denotes JEDEC No. 2) For details of dimensions, please refer to the technical specifications.

(Unit : mm)

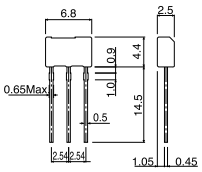
Leaded Type

SPT
(SC-72)



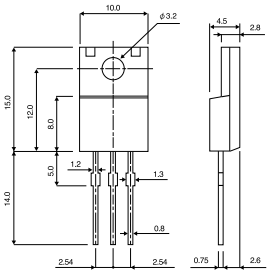
Taping specifications

ATV

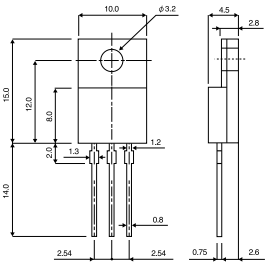


Taping specifications

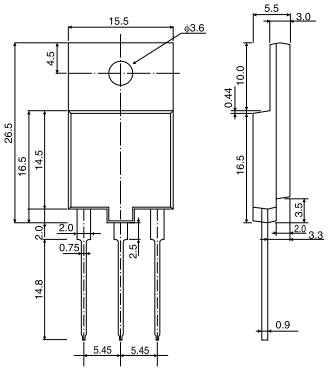
TO-220FN



TO-220FM



TO-3PF



Notes: 1) Characters in ( ) under package designation denotes JEITA No. Characters in < > under package designation denotes JEDEC No. 2) For details of dimensions, please refer to the technical specifications.

R0108B

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