

2009

Product Catalog



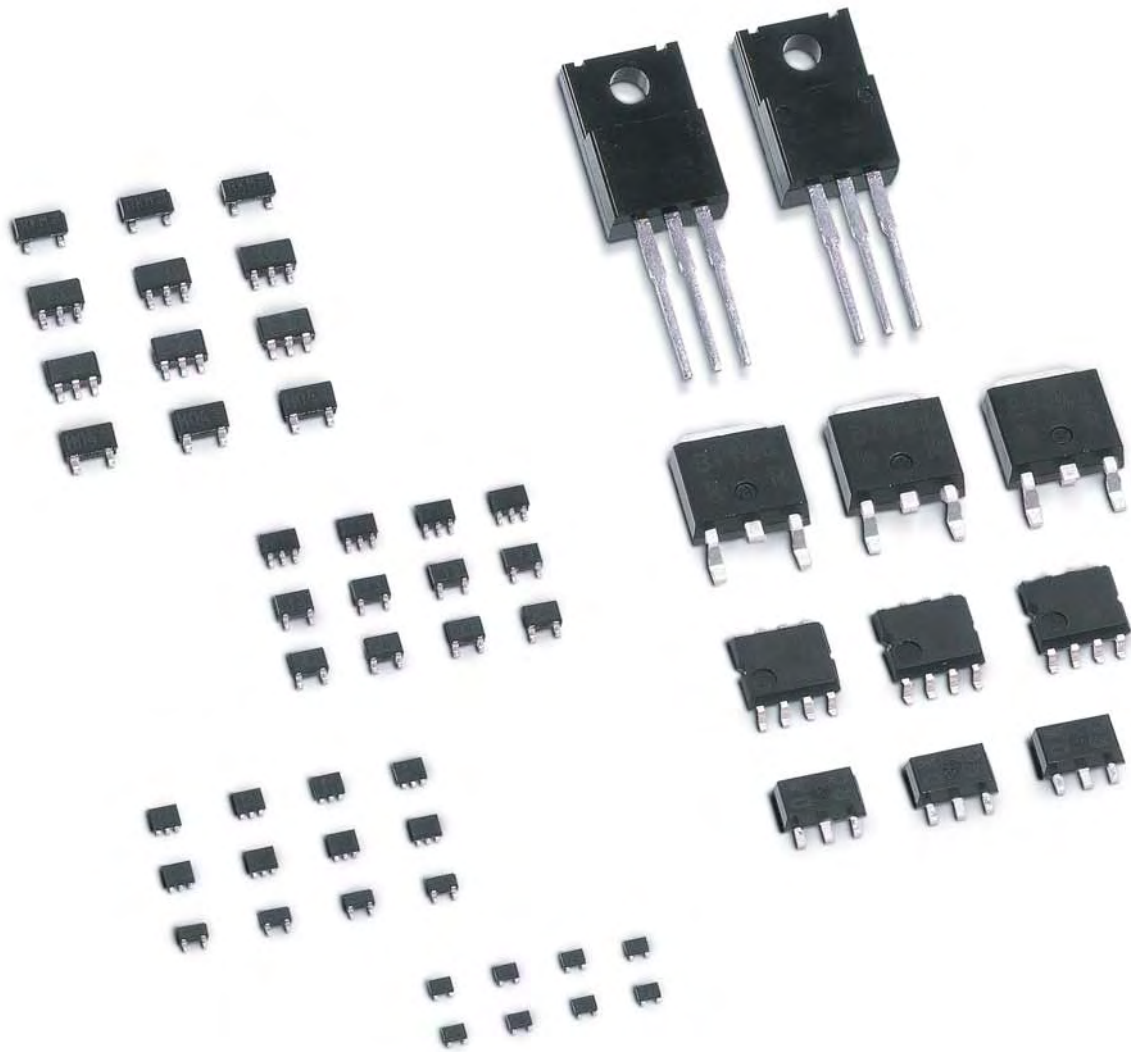
Discrete Semiconductors

MOSFETs



MOSFETs

ROHM offers a wide selection of MOSFETs, ranging from ultra-low ON-resistance products utilizing micro-process technology, high efficiency/breakdown units for switching applications, and high power components optimized for commercial/industrial systems.



Contents

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Low energy consumption series optimized for portable equipment.

High-speed Switching High Voltage Resistance MOSFETs	7
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This high performance, high speed switching series reduces switching loss by 30% compared to conventional products. (500V to 600V Class)

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Higher current-handling capability in the same mounting area as CPT3 products.

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V_{bss}=45V/60V products optimized for next-generation LED backlights and 24V input motor circuits.

Standard

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Internal Circuitry	16	Dimensions	17
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MOSFET Lineup Close Up

ECOMOS™ Series

	Drive Voltage (V)	V _{DSS} (V)	I _D (A)						Package	Page			
			0.2 / 0.3	1 / 1.3	1.5 / 2	2.4 / 2.5	3 / 3.5	4 / 4.5			5 / 6 / 7		
Single Type	1.2	20	<i>New</i> RUM002N02(N)							VMT3	P.5		
			<i>New</i> RZM002P02(P)							EMT3			
			<i>New</i> RUE002N02(N)										
			<i>New</i> RZE002P02(P)										
	1.5	12		<i>New</i> RZF013P01(P)	<i>New</i> RZF020P01(P)			RZF030P01(P)			TUMT3	P.6	
						<i>New</i> RZL025P01(P)	<i>New</i> RZL035P01(P)				TUMT6		
							<i>New</i> RZR020P01(P)	<i>New</i> RZR025P01(P)		RZR040P01(P)		TSMT3	
				<i>New</i> RW1A013ZP(P)	<i>New</i> RW1A020ZP(P)							WEMT6	
									<i>New</i> RZQ045P01(P)	<i>New</i> RZQ050P01(P)		TSMT6	P.5
									<i>New</i> RT1A040ZP(P)	<i>New</i> RT1A050ZP(P)		TSST8	P.6
										<i>New</i> RQ1A060ZP(P)		TSMT8	
										<i>New</i> RQ1A070ZP(P)		TSMT8	
	1.8	20			<i>New</i> RUF020N02(N)	<i>New</i> RUF025N02(N)					TUMT3	P.5	
								<i>New</i> RUL035N02(N)			TUMT6		
							<i>New</i> RUR020N02(N)			RUR040N02(N)		TSMT3	
										<i>New</i> RUQ050N02(N)		TSMT6	
					<i>New</i> RW1C015UN(N)						WEMT6	P.6	
					<i>New</i> RW1C020UN(N)						WEMT6		
Dual Type	1.2	20	<i>New</i> EM6K7(N+N)								P.5		
			<i>New</i> EM6J1(P+P)							EMT6			
			<i>New</i> EM6M2(P+N)										
	1.5	12		<i>New</i> US6J11(P+P)							TUMT6	P.6	
					<i>New</i> QS6J11(P+P)						TSMT6		
								<i>New</i> TT8J1(P+P)				TSST8	
										<i>New</i> QS8J1(P+P)		TSMT8	
		20				<i>New</i> TT8J21(P+P)				TSST8			
	1.8	20		<i>New</i> US6M11(P+N)							TUMT6	P.5	
			<i>New</i> EM6K6(N+N)		US6K4(N+N)						EMT6		
Built-in Diode	1.5	12		<i>New</i> ES6U1(P)						WEMT6	P.6		
		20			<i>New</i> ES6U2(N)								
						<i>New</i> TT8U1(P)					TSST8		
				QS5U34(N)	QS5U36(N)				TSMT5	P.5			

MPT6 Package Dual MOSFETs

Drive Voltage (V)	V _{DSS} (V)	I _D (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.7
			R5007ANJ(N)	R5009ANJ(N)	New R5011ANJ(N)	New R5013ANJ(N)	R5016ANJ(N)	New R5019ANJ(N)	New R5021ANJ(N)	LPT		
	500	New R5005CNX(N)	R5007ANX(N)	R5009ANX(N)	New R5011ANX(N)	R5013ANX(N)	R5016ANX(N)	New R5019ANX(N)	New R5021ANX(N)	TO-220FM		
		New R5205CND(N)	New R5207AND(N)							CPT3		
	525	New R6004AND(N)	New R6006AND(N)							CPT3		
										CPT3		
	600					New R6012ANJ(N)	New R6015ANJ(N)	New R6018ANJ(N)	New R6020ANJ(N)	LPT		
				R6008ANX(N)	New R6010ANX(N)	New R6012ANX(N)	New R6015ANX(N)	New R6018ANX(N)	New R6020ANX(N)	TO-220FM		
									★ R6025ANZ(N)	TO-3PF		

★: Under development

TCPT3 Package MOSFETs

Drive Voltage (V)	V _{DSS} (V)	I _D (A)				Package	Page
		15 / 16	18 / 19	20 / 21 / 22 / 25	30		
4	40				RSY300N04(N)	TCPT3	P.9
	45	RSY160P05(P)		RSY200N05(N)			

MOSFETs for LED Backlight / Motor Drive

	Drive Voltage (V)	V _{DSS} (V)	I _D (A)									Package	Page					
			0.2	1 / 1.5	2 / 2.5	3 / 3.5	4.5	5	6 / 6.5	7	8 / 8.5			9.5				
Single Type	2.5	45	New RJL002N06(N)										TUMT6	P.10				
					New RTR030N05(N)								TSMT3					
			New RTR025N05(N) RTR020N05(N)										TSMT3					
			New RTQ020N05(N)										TSMT6					
	4	60		New RSR020N06(N)	New RSR030N06(N)								RSS060P05 (P)		RSS070N05(N) RSS070P05(P)	RSS085N05(N) RSS080N05(N)	RSS095N05 (N)	SOP8
			New RSQ015N06(N)															TSMT3
																		TSMT6
															RSS065N06 (N)			
Dual Type	2.5	45	New QS6K21(N+N)													TSMT6		
																	SOP8	
	4	60				SP8K31 (N+N)	SP8K32 (N+N)	SP8K33 (N+N)								SOP8		

ECOMOS™ Series



Significantly reduced power consumption

Summary

New low voltage drive processes enable operation from $V_{GS}=1.2V$ to 1.8V.

Features

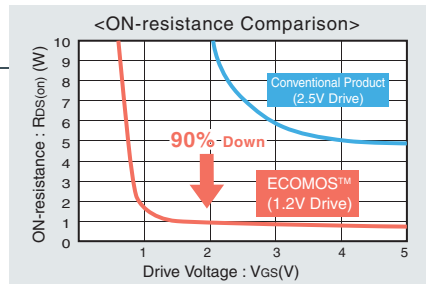
- Low voltage drive
- Low ON-resistance

Applications

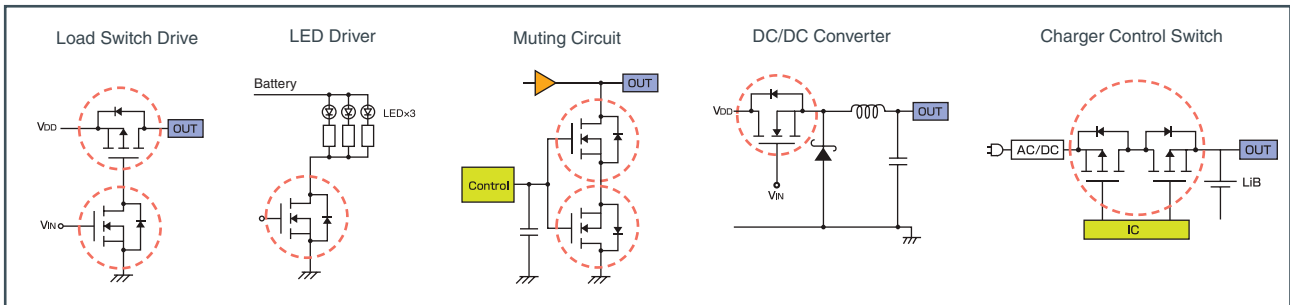
General load switches, LED drives, muting circuits, DC/DC converters, switches for charger control, and more.

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 90% less power consumption when ON.



Circuit Examples



Lineup

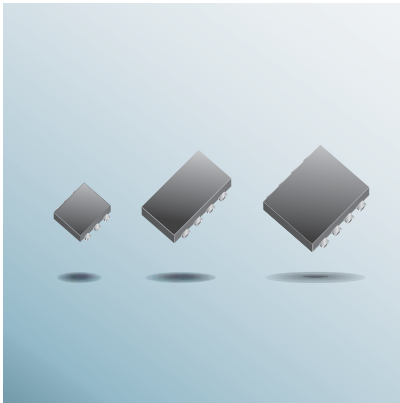
Package	Pd(W)	Polarity	Part No.	V _{DS} (V)	I _D (A)	R _{DS(on)} Typ. (mΩ)			Drive Voltage (V)	Internal Circuit
						V _{GS} =1.5V	V _{GS} =2.5V	V _{GS} =4.5V		
VMT3	0.15	Nch	New RUM002N02	20	0.2	1.6Ω ^{*1}	0.8Ω	0.1Ω	1.2	—
			RUM003N02	20	0.3	1Ω ^{*2}	0.8Ω	0.7Ω ^{*3}	1.8	—
		Pch	New RZM002P02	-20	-0.2	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	⑩
			New EM6M2	-20	0.3	1.6Ω ^{*1}	0.8Ω	0.7Ω	1.2	⑩
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	—
			New RZF030P01	-12	-3	72	39	28	1.5	—
			—	—	—	—	—	—	—	—

Note : Please see p.16 for the internal circuitry

Package	Pd(W)	Polarity	Part No.	V _{DS} (V)	I _D (A)	R _{DS(on)} Typ. (mΩ)			Drive Voltage (V)	Internal Circuit	
						V _{GS} =1.5V	V _{GS} =2.5V	V _{GS} =4.5V			
TUMT6	1	Nch	RUL035N02	20	3.5	66	38	31	1.5	—	
			New RZL025P01	-12	-2.5	110	60	44	1.5	—	
		Pch	New RZL035P01	-12	-3.5	66	36	26	1.5	—	
			Nch+Nch	New US6K4	20	1.5	220 ^{*2}	170	130	1.8	⑨
			Pch+Pch	New US6J11	-12	-1.3	530	280	190	1.5	⑩
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	—	
			New 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	—	
			New RZQ045P01	-12	-4.5	50	31	25	1.5	—	
		Pch	New RZQ050P01	-12	-5	44	26	19	1.5	—	
			New QS6J11	-12	-2	200	105	75	1.5	⑩	

*1 $V_{GS}=1.2V$ *2 $V_{GS}=1.8V$ *3 $V_{GS}=4V$

ECOMOS™ WEMT6 / TSST8 / TSMT8 Package



Lower ON-resistance in compact, high power packages


Summary

The ECOMOS™ series integrates high power in a number of compact, low profile package types.

Features

- Small, thin, high power
- Reduced surface mount area


WEMT6



PD=0.7W 1.6x1.6x0.6mm
190mΩ Typ. (at 4.5V)
 ES6U1(Nch+SBD 0.5A)
 Identical performance in a thinner, smaller package


30% thinner ↑ 40% Smaller

TUMT5



170mΩ Typ. (at 4.5V)
 US5U1(Nch+SBD 0.5A)


TSST8



PD=1.25W 3.0x1.9x0.8mm
19mΩ Typ. (at 4.5V)
 RT1A050ZP


↑ RDS(on) 60% lower

TUMT6



50mΩ Typ. (at 4.5V)
 RTL030P02


TSMT8



PD=1.5W 3.0x2.8x0.8mm
8mΩ Typ. (at 4.5V)
 RQ1A070ZP

↑ RDS(on) 80% lower

TSMT6



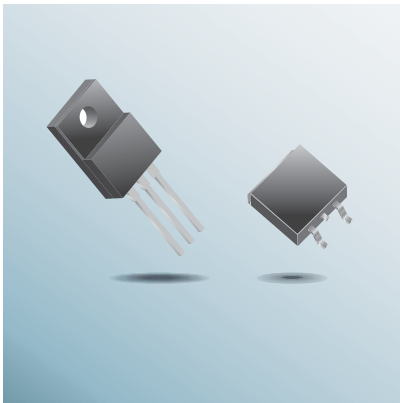
35mΩ Typ. (at 4.5V)
 RTQ040P02

Lineup

Package	Pb(W)	Polarity	Part No.	V _{DS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)			Drive Voltage (V)	Internal Circuit
						V _{GS} =1.5V	V _{GS} =2.5V	V _{GS} =4.5V		
WEMT6	0.7	Nch	New RW1C015UN	20	1.5	300	170	130	1.5	—
			New RW1C020UN	20	2	170	95	75	1.5	—
		Nch+SBD(0.5A)	New ES6U2	20	1.5	300	170	130	1.5	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	⑤
TSST8	1.25	Pch	New RT1A040ZP	-12	-4	55	30	22	1.5	—
			New RT1A050ZP	-12	-5	48	26	19	1.5	—
		Pch+Pch	New TT8J1	-12	-2.5	110	60	44	1.5	⑫
			New TT8J21	-20	-2.5	140	68	49	1.5	⑫
		Pch+SBD(1A)	New TT8U1	-20	-2.4	180	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

High-speed Switching High Voltage Resistance MOSFETs



Lower switching loss

Summary

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

Features

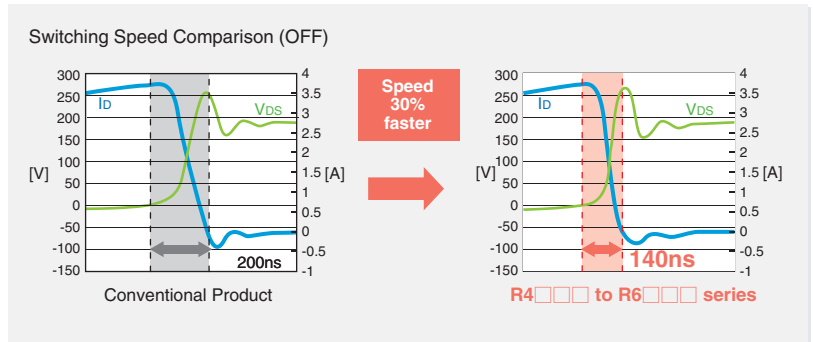
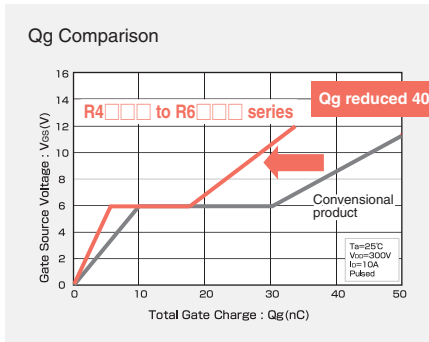
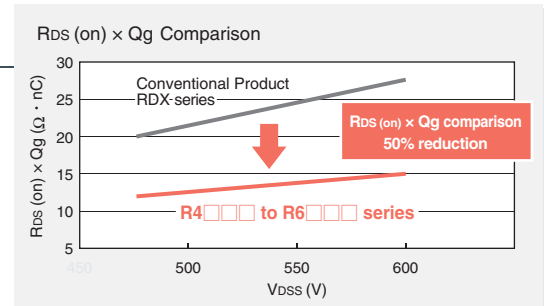
- High-speed switching (LOW Qg)
- Low ON-resistance

Applications

- Switching power supplies
- Lighting

High-speed switching (Low switching loss)

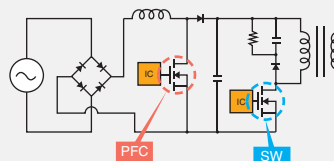
New high voltage resistance processes ensure low ON-resistance and low Qg, with an $R_{DS(on)} \times Q_g$ value 50% less than conventional products. The result is dramatically improved switching speed (up to 30%) with less switching loss. The lineup is available in two different power packages, TO-220FM and LPT, featuring lower heat emission.



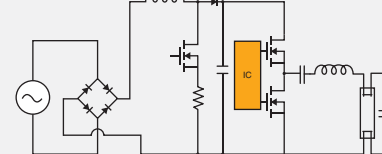
Circuit Examples

ROHM MOSFETs are ideal for use in the PFC block, requiring low ON-resistance, and in switching (SW) circuits, where switching speed is of critical importance. Also suitable for ballast circuits in lighting devices.

Switching power supply circuit (Primary)



Ballast circuit

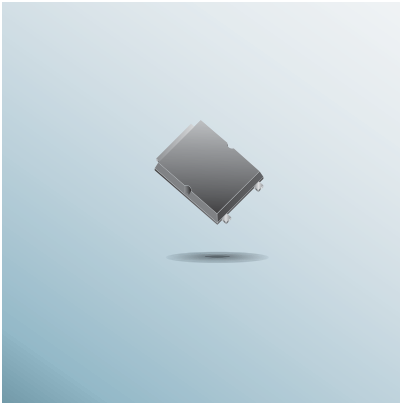


Lineup

Package	Pd(W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(Ω) V _{GS} =10V	Q _g (nC) V _{GS} =10V
CPT3	20	Nch	New R4008AND	400	8	0.73	15
	40	Nch	New R5205CND	525	5	1.3	9.5
			New R5207AND	525	7	0.78	13
			New R6004CND	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	150	Nch	★ R6025ANZ	600	25	0.12	85

★ : Under development

TCPT3 Package MOSFETs



Reduces heat generation in a variety of circuits, including LCD backlight inverters

Summary

Higher current in the same footprint.

Features

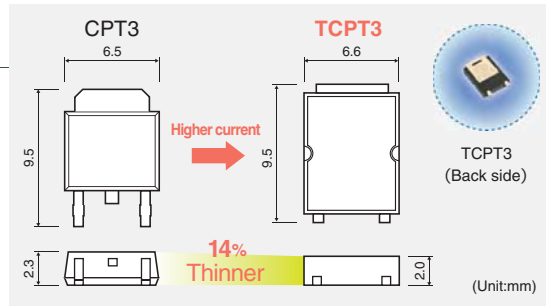
- Thin package
- High power

Application

- LCD backlight inverters
- Motor drive circuits

Thin, high power package

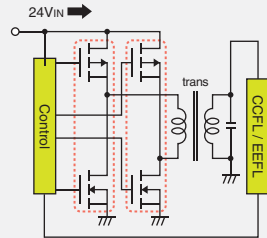
Improved heat radiation characteristics enables higher current intake in the same mounting area as conventional CPT3 package types.



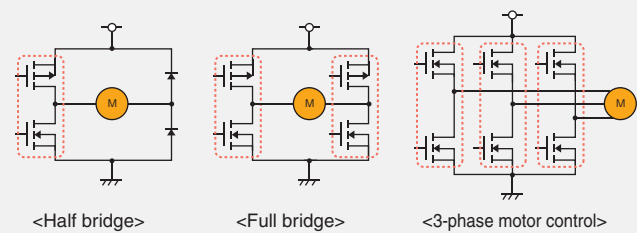
Circuit Examples

Controlling heat emission is a major challenge with large LCDs. ROHM's high power TCPT3 package helps improve heat dissipation in backlight inverter circuits.

LCD backlight inverter circuit



Motor drive circuit

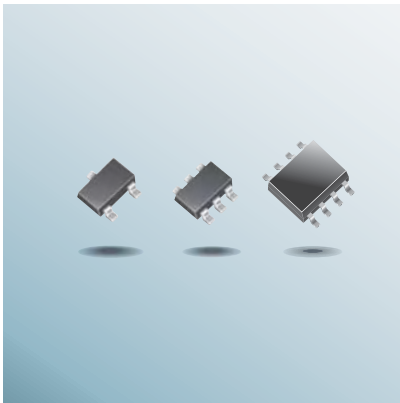


Lineup

Package	P _D (W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)			Q _g (nC) V _{GS} =5V
						V _{GS} =4V	V _{GS} =4.5V	V _{GS} =10V	
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

MOSFETs for LED Backlight Motor Drives

45/60V (V_{DSS}) Series



Summary

ROHM V_{DSS}=45V/60V products are optimized for next-generation LED backlighting applications and 24V input motor circuits.

Features

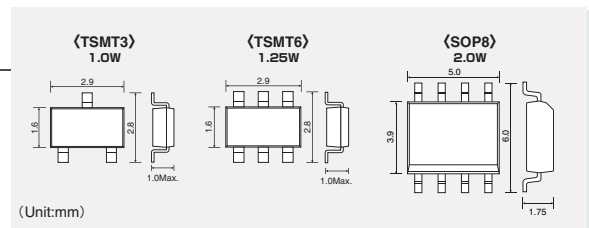
·Low ON-resistance

Application

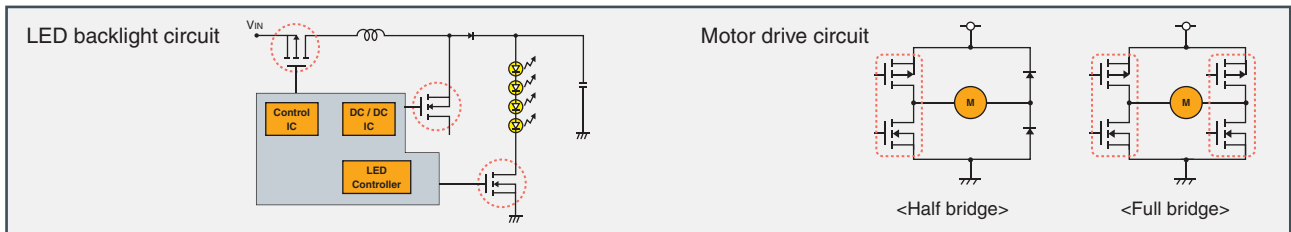
·LED backlight circuits
·Motor drive circuits

Broad lineup

A wide lineup of products are available in multiple configurations and package types (i.e. V_{DSS}=45/60V, Pch/Nch, Single/Dual, TSMT3/6/SOP8).



Circuit Examples



Lineup

Package	P _D (W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)				Q _g (nC) V _{GS} =5V	Internal Circuit
						V _{GS} =2.5V	V _{GS} =4.0V	V _{GS} =4.5V	V _{GS} =10V		
TUMT6	1.0	Nch	RJL002N06	45	0.2	2.2Ω	1.7Ω	1.6Ω	—	—	—
TSMT3	1.0	Nch	RTR030N05	45	3.0	65	50	45	—	6.2 ^{*1}	—
		Nch	RTR025N05	45	2.5	125	95	90	—	3.2 ^{*1}	—
		Nch	RTR020N05	45	2.0	180	135	130	—	2.9 ^{*1}	—
TSMT6	1.25	Nch	RTQ020N05	45	2.0	200	150	140	—	2.3 ^{*1}	—
		Nch	RSR030N06	60	3.0	—	75	70	60	5	—
		Nch	RSR020N06	60	2.0	—	150	140	120	2.7	—
		Nch	RSQ015N06	60	1.5	—	275	260	230	2	—
SOP8	2.0	Nch+Nch	QS6K21	45	1.0	415	310	300	—	1.5 ^{*1}	⑨
		Nch	RSS095N05	45	9.5	—	15	14	11	18.9	—
		Nch	RSS085N05	45	8.5	—	18	16	13	15.3	—
		Nch	RSS080N05	45	8.5	—	20	18	15	13	—
		Nch	RSS070N05	45	7.0	—	25	23	18	12	—
		Nch	RSS065N06	60	6.5	—	31	28	24	11	—
		Nch+Nch	SP8K24	45	6.0	—	26	24	18	15.4	⑬
		Nch+Nch	SP8K23	45	5.0	—	36	33	26	8.6	⑬
		Nch+Nch	SP8K22	45	4.5	—	46	41	33	6.8	⑬
		Nch+Nch	SP8K33	60	5.0	—	40	38	34	8	⑬
		Nch+Nch	SP8K32	60	4.5	—	55	52	46	7	⑬
		Nch+Nch	SP8K31	60	3.5	—	105	100	85	3.7	⑬
		Pch	RSS070P05	—45	—7.0	—	28	25	19	34	—
Pch	RSS060P05	—45	—6.0	—	38	35	26	23	—		

Note : Please see p.16 for the internal circuitry

*1=V_{GS}=4.5V

MOSFET Lineup

Standard

Small signal MOSFETs

Package	Pd(W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(Ω)			
						V _{GS} =2.5V	V _{GS} =4V	V _{GS} =4.5V	V _{GS} =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

* V_{GS}=5V

Middle Power MOSFETs

Package	Pd(W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)				Qg(nC) V _{GS} =4.5V
						V _{GS} =2.5V	V _{GS} =4V	V _{GS} =4.5V	V _{GS} =10V	
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
			US6K1	30	1.5	240	180	170	–	1.6
		Nch+Nch	US6K2	30	1.4	–	270	250	170	1.4 *
			Nch+SBD(0.7A)	US6U37	30	1.5	240	180	170	–
		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	–
		US6M1		–20	–1	570	310	280	–	2.1
US6M1	30	1.4		–	270	250	170	1.4 *		
US6M1	–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
			TT8M2	–20	–2.5	68	–	49	–	12
TSMT5	1.25	Nch+Nch	QS5K2	30	2	110	76	71	–	2.8
			QS5U12 *1	30	2	110	76	71	–	2.8
		Nch+SBD(1A)	QS5U17 *1	30	2	110	76	71	–	2.8
			QS5U13 *2	30	2	110	76	71	–	2.8
		Nch+SBD(0.5A)	QS5U16 *2	30	2	110	76	71	–	2.8
			QS5U28	–20	–2	175	97	90	–	4.8
		Pch+SBD(1A)	QS5U21 *3	–20	–1.5	260	180	160	–	4.2
			QS5U27 *3	–20	–1.5	260	180	160	–	4.2
			QS5U33	–30	–2	–	160	145	95	3.4 *
		Pch+SBD(0.5A)	QS5U23 *4	–20	–1.5	260	180	160	–	4.2
QS5U26 *4	–20		–1.5	260	180	160	–	4.2		

*1,2,3,4 : Please note that, although the internal circuit configuration may differ between part numbers, the electrical specifications remain the same.

*V_{GS}=5V

■ Middle Power MOSFETs

Package	Pd(W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)				Q _g (nC) V _{GS} =4.5V
						V _{GS} =2.5V	V _{GS} =4V	V _{GS} =4.5V	V _{GS} =10V	
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 *
			<i>New</i> 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 *
			<i>New</i> RTQ020N05	45	2	200	150	140	–	2.3
			RVQ040N05	45	4	–	53	47	38	6.3
			<i>New</i> 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 *
			<i>New</i> RRQ030P03	–30	–3	–	95	85	55	5.2 *
			RSQ030P03	–30	–3	–	100	90	60	6 *
		Pch+Pch	RSQ035P03	–30	–3.5	–	70	65	45	9.2 *
			QS6J1	–20	–1.5	310	170	155	–	3
		Nch+Pch	QS6J3	–20	–1.5	310	170	155	–	3
			QS6M3	30	1.5	260	180	170	–	1.6
			QS6M4	–20	–1.5	310	170	155	–	3
		Pch+SBD(0.5A)	QS6U2	–20	–1.5	310	170	155	–	3
			QS6U24	–30	–1	–	600	500	300	1.7 *
		MPT3	*1 2.0	Nch	RHP030N03	30	3	–	160	–
RJP020N06	60				2	210	170	165	–	–
RHP020N06	60				2	–	240	200	150	–

*1: When mounted on a 40x40x0.7mm ceramic substrate

*V_{GS}=5V

■ Middle Power MOSFETs <SOP8>

Package	Pd(W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)			Q _g (nC) V _{GS} =5V	
						V _{GS} =4V	V _{GS} =4.5V	V _{GS} =10V		
SOP8	2.0	Nch	RSS065N03	30	6.5	30	27	19	6.1	
			RSS090N03	30	9	17	15	11	11	
			RSS100N03	30	10	13.5	12.5	9.5	14	
			RSS110N03	30	11	11.2	10.3	7.6	17	
			RSS125N03	30	12.5	9.3	8.6	6.5	20	
			RSS130N03	30	13	7.9	7.4	5.9	25	
			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	
			SP8K2	30	6	33	30	21	7.2	
			SP8K3	30	7	25	23	17	8.4	
			SP8K4	30	9	17	16	12	15	
			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.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(mΩ)			Q _g (nC) V _{GS} =5V
						V _{GS} =4V	V _{GS} =4.5V	V _{GS} =10V	
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
			SP8M3	30	5	58	52	36	3.9
				-30	-4.5	65	57	40	8.5
			SP8M4	30	9	17	16	12	15
				-30	-7	30	25	20	25
			SP8M5	30	6	33	30	21	7.2
				-30	-7	30	25	20	25
			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*			

* V_{GS}=10V

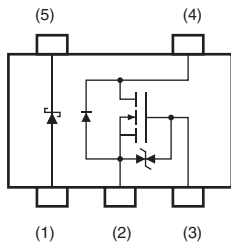
■ Power MOSFETs (CPT3, TO-220FN, TO220-FM)

Package	Pd(W)	Polarity	Part No.	V _{DSS} (V)	I _D (A)	R _{DS(on)} Typ.(Ω)	
						V _{GS} =4V	V _{GS} =10V
CPT3	20	Nch	New RSD220N06	60	22	0.03	0.022
			RSD200N10	100	20	0.045	0.041
			RDD050N20	200	5	–	0.55
TO-220FN	30	Nch	RDN050N20	200	5	–	0.55
	35		RDN100N20	200	10	–	0.27
	40		RDN150N20	200	15	–	0.12
	35		RDN080N25	250	8	–	0.38
	40		RDN120N25	250	12	–	0.16
TO-220FM	35	Nch	RDX050N50	500	5	–	1.1
	40		RDX080N50	500	8	–	0.65
	45		RDX120N50	500	12	–	0.38
	30		RDX030N60	600	3	–	2.7
	35		RDX045N60	600	4.5	–	1.6
	40		RDX060N60	600	6	–	0.9
	45		RDX100N60	600	10	–	0.48

Internal Circuits

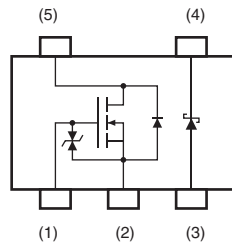
MOSFET + SBD

① Nch+SBD



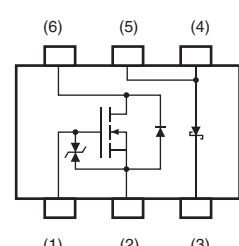
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- (2) Source
- (3) Gate
- (4) Drain
- (5) Cathode

② Nch+SBD



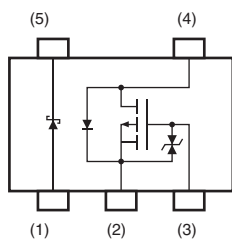
- (1) Gate
- (2) Source
- (3) Anode
- (4) Cathode
- (5) Drain

③ Nch+SBD



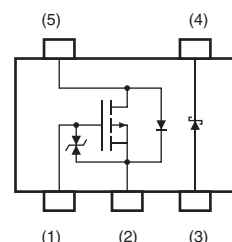
- (1) Gate
- (2) Source
- (3) Cathode
- (4) Anode
- (5) Anode
- (6) Drain

④ Pch+SBD



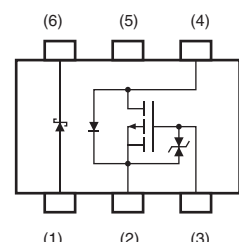
- (1) Anode
- (2) Source
- (3) Gate
- (4) Drain
- (5) Cathode

⑤ Pch+SBD



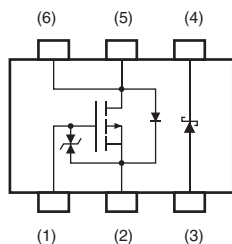
- (1) Gate
- (2) Source
- (3) Anode
- (4) Cathode
- (5) Drain

⑥ Pch+SBD



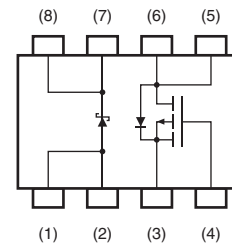
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- (2) Source
- (3) Gate
- (4) Drain
- (5) N/C
- (6) Cathode

⑦ Pch+SBD



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

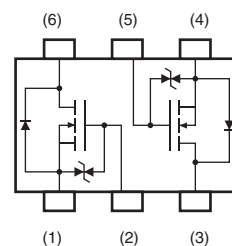
⑧ Pch+SBD



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

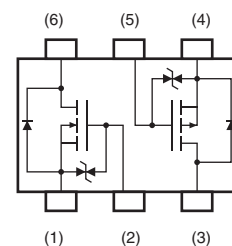
MOSFET Dual

⑨ Nch+Nch



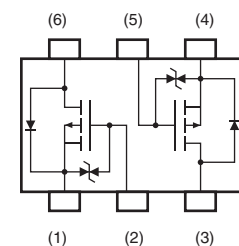
- (1) TR1: Source
- (2) TR1: Gate
- (3) TR2: Drain
- (4) TR2: Source
- (5) TR2: Gate
- (6) TR1: Drain

⑩ Nch+Pch



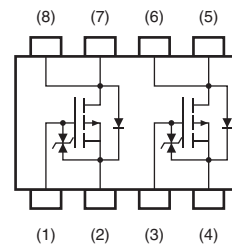
- (1) TR1: Source
- (2) TR1: Gate
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- (4) TR2: Source
- (5) TR2: Gate
- (6) TR1: Drain

⑪ Pch+Pch



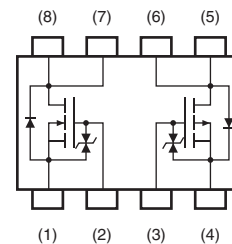
- (1) TR1: Source
- (2) TR1: Gate
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- (4) TR2: Source
- (5) TR2: Gate
- (6) TR1: Drain

⑫ Pch+Pch



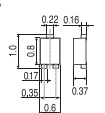
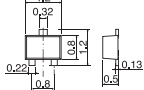
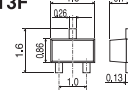
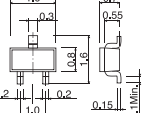
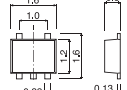
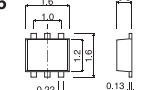
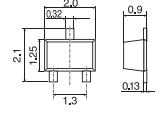
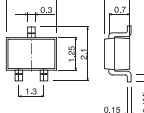
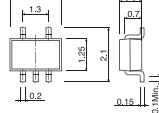
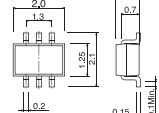
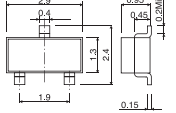
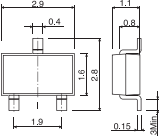
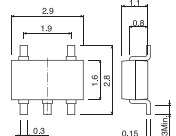
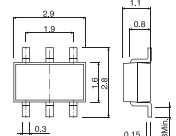
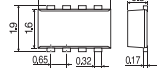
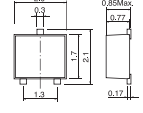
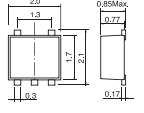
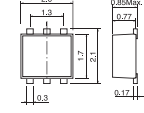
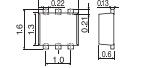
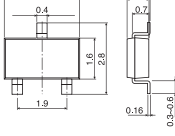
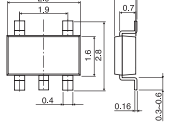
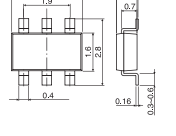
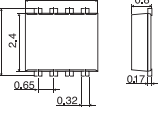
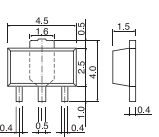
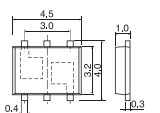
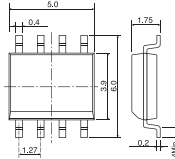
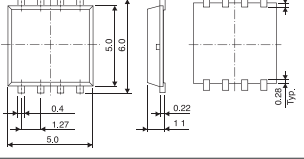
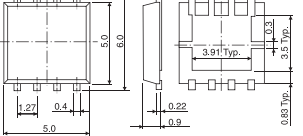
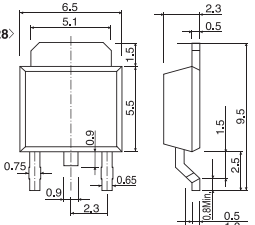
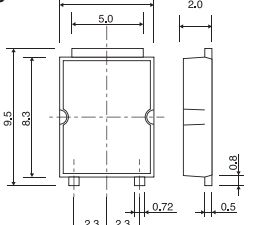
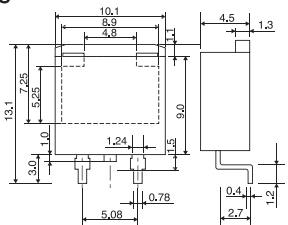
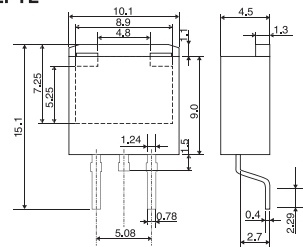
- (1) TR1: Gate
- (2) TR1: Source
- (3) TR2: Gate
- (4) TR2: Source
- (5) TR2: Drain
- (6) TR2: Drain
- (7) TR1: Drain
- (8) TR1: Drain

⑬ Nch+Nch



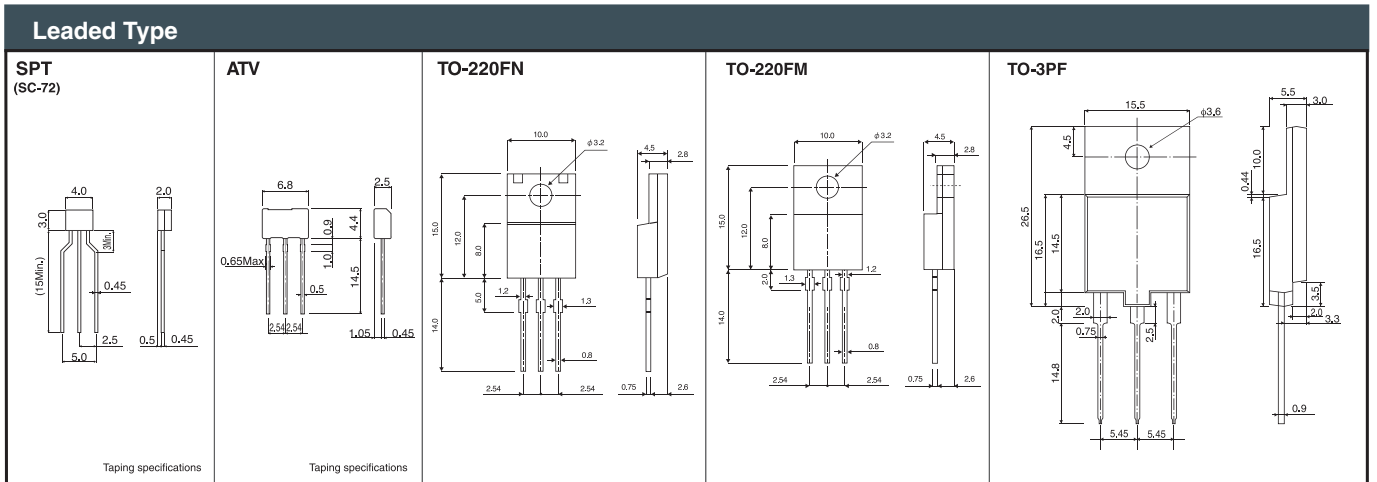
- (1) TR1: Source
- (2) TR1: Gate
- (3) TR2: Source
- (4) TR2: Gate
- (5) TR2: Drain
- (6) TR2: Drain
- (7) TR1: Drain
- (8) TR1: Drain

Dimensions

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 	TUMT6 	WEMT6 	
TSMT3 	TSMT5 	TSMT6 	TSMT8 	
MPT3 (SC-62) <SOT-89> 	MPT6 	SOP8 	PSOP8S 	PSOP8 
CPT3 (SC-63) <SOT-428> 	TCPT3 	LPTS 	LPTL 	

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 2) For additional details, please refer to the relevant technical specifications.

(Unit : mm)



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 2) For additional details, please refer to the relevant technical specifications.

(Unit : mm)

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Chicago +1-847-368-1006	Salò +358-2-7332234	Nanjing +86-25-8689-0015	Taipei +886-2-2500-8956
Dallas +1-972-473-3748	Oulu +358-8-5372930	Ningbo +86-574-87654201	Kaohsiung +886-7-237-0881
Denver +1-303-708-0908	Barcelona +34-9375-24320	Qingdao +86-532-8577-9312	Singapore +65-6332-2322
Detroit +1-248-348-9920	Hungary +36-1-4719338	Suzhou +86-512-6807-1300	Philippines +63-2-807-6872
Nashville +1-615-620-6700	Poland +48-22-5757213	Wuxi +86-510-82702693	Thailand +66-2-254-4890
Mexico +52-33-3123-2001	Russia +7-495-739-41-74	Guangzhou +86-20-3878-8100	Kuala Lumpur +60-3-7958-8355
Düsseldorf +49-2154-9210	Seoul +82-2-8182-700	Huizhou +86-752-205-1054	Penang +60-4-2286453
Munich +49-8999-216168	Masan +82-55-240-6234	Fuzhou +86-591-8801-8698	Kyoto +81-75-365-1218
Stuttgart +49-711-7272-370	Dalian +86-411-8230-8549	Dongguan +86-769-8393-3320	Yokohama +81-45-476-2290
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