

2010

Product Catalog



Discrete Semiconductors

Bipolar Transistors

Digital Transistors



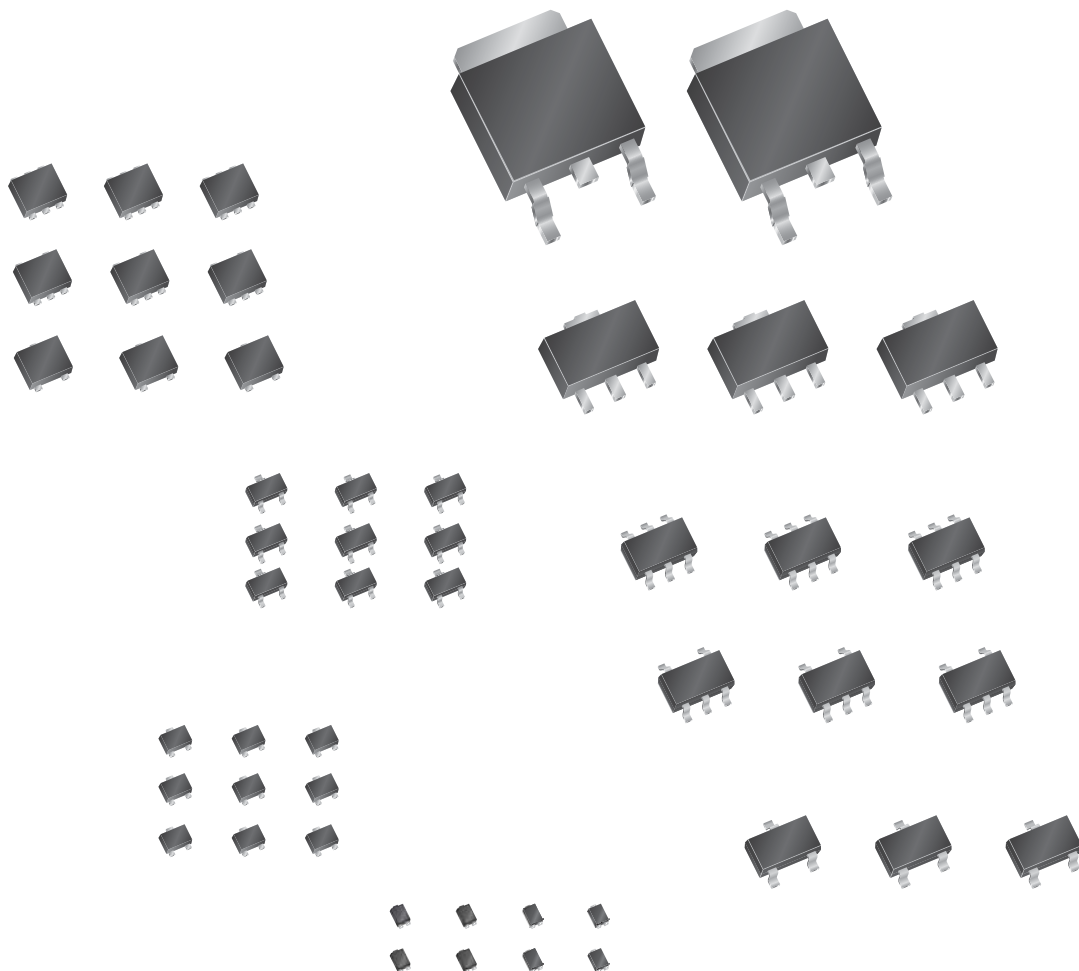
ROHM Co.,Ltd.

Bipolar Transistors

ROHM bipolar transistors were developed to be energy efficient, highly reliable, and compact. A wide range of products are offered, from small-signal and low profile models to high power products.

Digital Transistors

Digital transistors, pioneered by ROHM, incorporate resistor(s) for digital circuits. The broad lineup includes space-saving, ultra-compact types available in a range of internal resistance configurations.



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Lineup

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Ultra-Compact Package : VMN3



60% smaller mounting space,
35% thinner

Summary

This series of ultra-compact, low-profile transistors reduces mounting area by 60% and height by 35% compared with conventional VMT3 package types.

Features

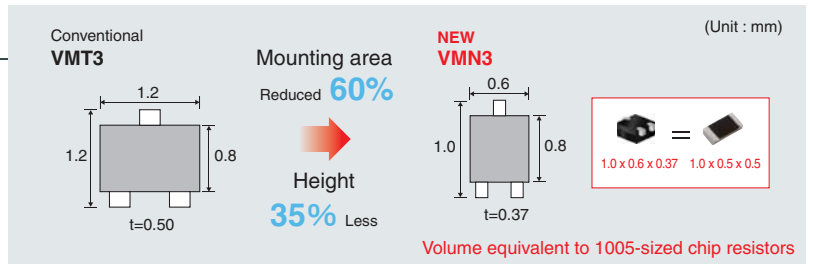
- Ultra-compact
- Low profile

Applications

- Switching in portable devices

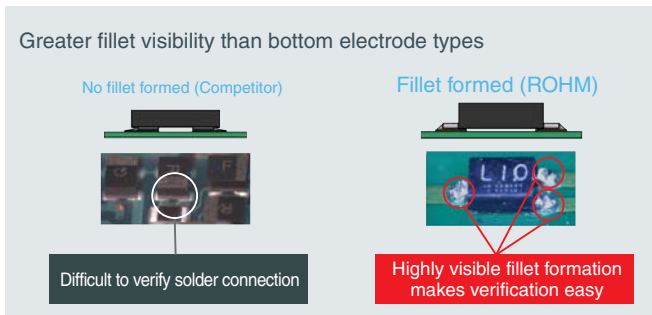
Ultra-compact. Low profile.

Compared to the conventional VMT3 package (1.2x1.2, t=0.5mm), ROHM's new VMN3 (0.6x1.0, t=0.37mm) decreases mounting area by 60% and height by 35%.

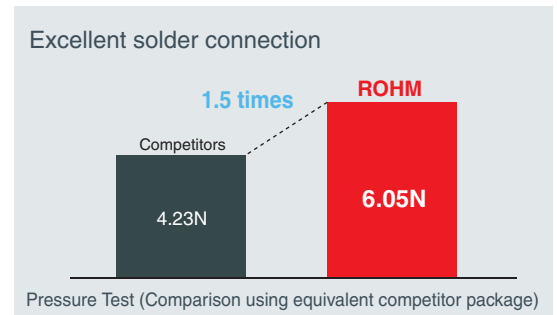


Excellent fillet visibility and superior joint strength

Features 1



Features 2



Lineup

Bipolar Transistors

Part No.	Polarity	V _{CEO} (V)	I _c (mA)	h _{FE}		V _{CE(sat)} Max.	
				@ V _{CE} / I _c	(V)	@ I _c / I _B	
2SA2199	PNP	-50	-100	120 to 390	-6V / -2mA	-0.3	-25mA / -2.5mA
2SC6114	NPN	50	100	120 to 390	6V / 2mA	0.3	25mA / 2.5mA

Digital Transistors

Part No.	Polarity	V _{CC} (V)	I _o (mA)	R1 (KΩ)	R2 (KΩ)	GI
DTA114EB	PNP	-50	-50	10	10	30 or more
DTC114EB	NPN	50	50	10	10	30 or more
DTA144EB	PNP	-50	-50	47	47	68 or more
DTC144EB	NPN	50	50	47	47	68 or more

Compact Hybrid Package : VMT6



Mounting space reduced 43%

Summary

The new compact VMT6 complex package reduces mounting area by 43% over conventional EMT6 units and 50% compared to dual-VMT3 configurations.

Features

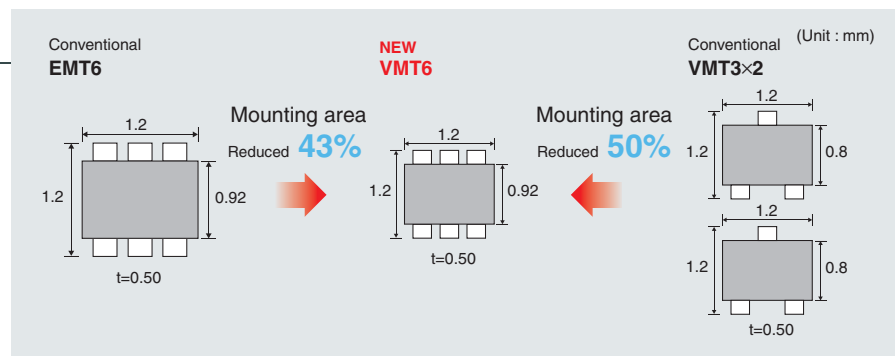
- Ultra-small
- Complex type

Applications

- General-purpose switching applications in portable devices
- Current mirror circuits and more

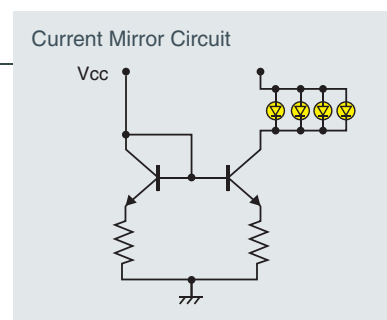
Ultra-compact • Complex

The new VMT6 package reduces mounting area by 43% over conventional EMT6 types. In addition, making the product complex by adding an additional transistor element reduces package size by 50% over conventional dual-VMT3 package solutions (1.2x1.2, t=0.5mm).



Guaranteed hFE characteristics

The hFE of both internal transistors are guaranteed to be nearly identical : $h_{FE1}/h_{FE2} = 0.9-1.1$ (VT6T11, VT6T12, VT6X11, VT6X12)



Lineup

Bipolar Transistors

Part No.	V _{CEO} (V)	I _C (mA)	h _{FE}	h _{FE} Ratio	P _c (W)	Equivalent Circuit Diagram
New VT6T1	-20	-200				
New VT6T2	-50	-100				
New VT6X1	20	200				
New VT6X2	50	100				
New VT6T11	-20	-200	120 to 560	0.9 to 1.1	0.15	
New VT6T12	-50	-100				
New VT6X11	20	200				
New VT6X12	50	100				
New VT6Z1	-20 / 20	-200 / 200				
New VT6Z2	-50 / 50	-100 / 100				

Complex Bipolar Transistors : MPT6



Mounting area and parts reduced by half

Summary

The new MPT6 package integrates two conventional MPT3 units, resulting in 50% smaller mounting area and 35% less height.

Features

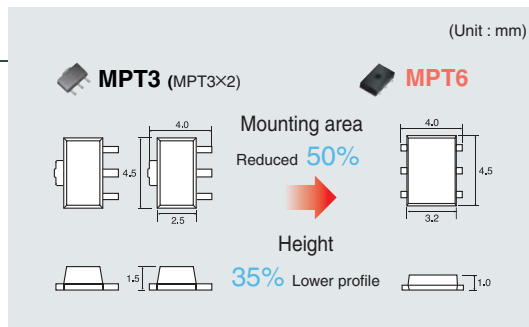
- Space saving

Applications

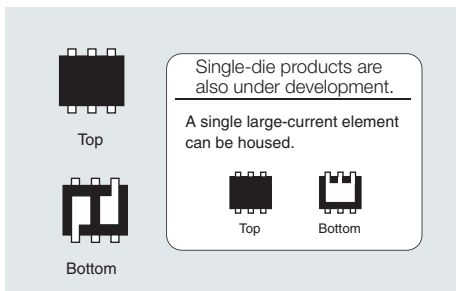
- Buffers
- Collector resonance circuits
- Motor drive circuits

Thin, compact package

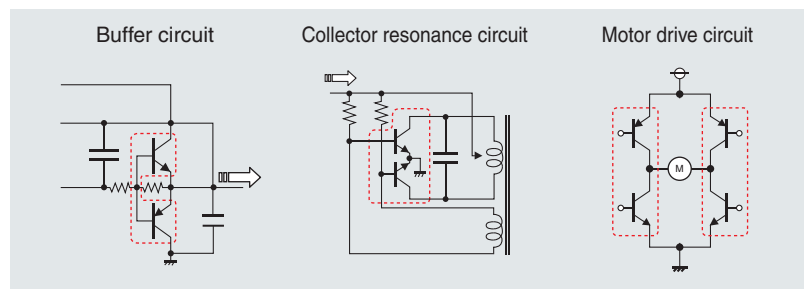
The new package makes it possible to reduce mounting area as well as the number of transistors by half.



Dimensions



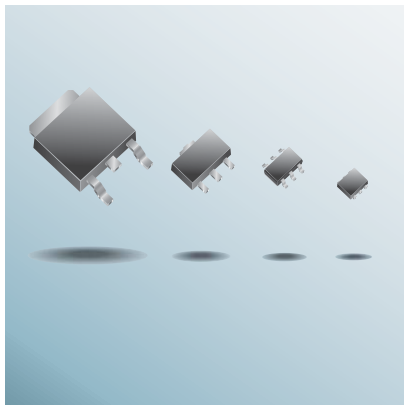
Circuit Examples



Lineup

Part No.	Internal Circuit	Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}
MP6T1		2SB1132x2	-32	-1	120 to 390
MP6T2		2SB1188x2	-32	-2	120 to 390
MP6T3		2SA2071x2	-60	-3	120 to 270
MP6X1		2SD1664x2	32	1	120 to 390
MP6X2		2SD1766x2	32	2	120 to 390
MP6X3		2SC5824x2	60	3	120 to 270
MP6Z1		2SB1132	-32	-1	120 to 390
MP6Z2		2SD1664	32	1	120 to 390
		2SB1188	-32	-2	120 to 390
MP6Z3		2SD1766	32	2	120 to 390
	2SA2071	-60	-3	120 to 270	
MP6H1		2SC5824	60	3	120 to 270
		DTDG14GPx2	60±10	1	300 or more

Transistors for Solenoid/Motor/Relay Drive



40% smaller mounting area

Summary

All functions required for motor drive, including the clamping diode, current limiting resistor, and protection resistor, are integrated into one package, reducing mounting area by 40% over discrete solutions.

Features

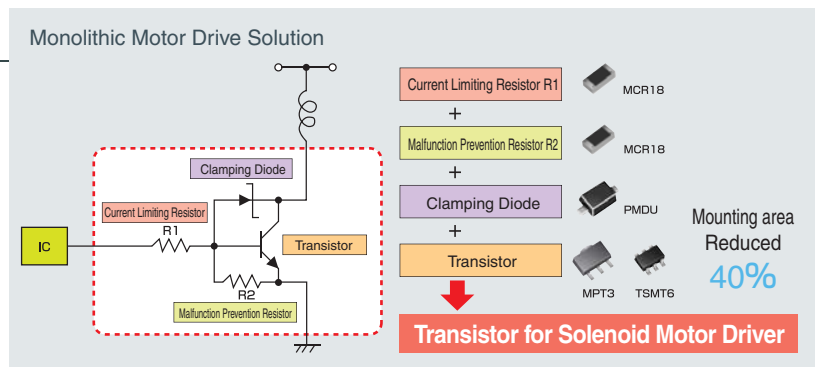
- Space saving
- High breakdown resistance
- Protection function

Applications

- Automotive systems (e.g. motor/relay drives)

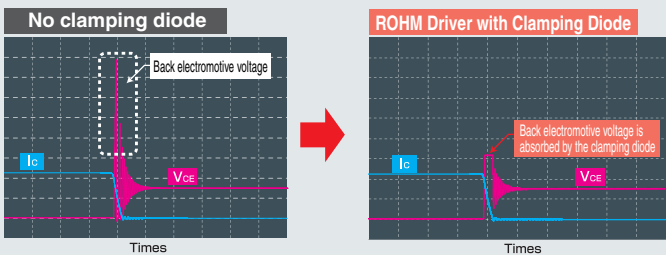
High breakdown resistance in a space-saving design

Back EMF generated by coils in the motor is absorbed by the built-in clamp diode featuring high breakdown resistance. Current limiting and protection resistors are also integrated, reducing mounting area by up to 40%.



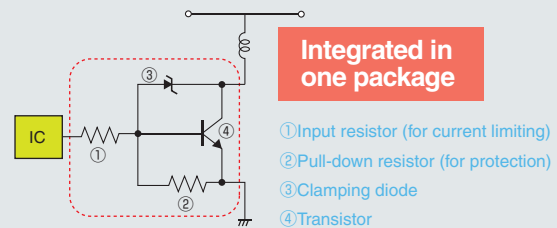
Characteristics Comparison

The die is protected from back electromotive force by the internal clamping diode.



Circuit Example

Motor drive circuit

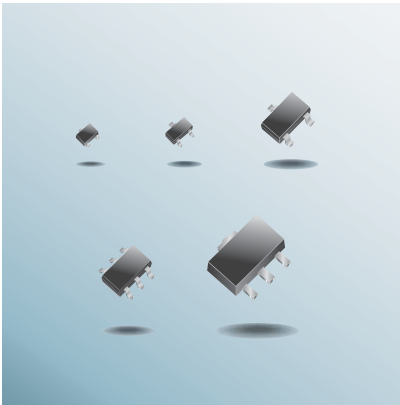


- Saves space and requires fewer parts
- Integrated clamping diode ensures high breakdown resistance
- Built-in resistor enables direct drive operation (from IC)
- Equipped with pull-down resistor to prevent noise-induced malfunctions

Lineup

Package	Part No.	Internal Circuit	$V_{CE0}(V_{CC})$ (V)	$I_{c}(I_o)$ (A)	h_{FE} (Gt)
MPT3 $P_c=0.5W$	DTDG23YP		60 ± 10	1	300 or more
	DTDG14GP		60 ± 10	1	300 or more
CPT3 (D-PAK) $P_c=1W$	2SD2143		60 ± 10	2	1k to 10k
TSMT6 $P_c=0.5W$	QSH29		60 ± 10	0.5	500 or more
MPT6 $P_c=2W$	MP6H1		60 ± 10	1	300 or more

Low $V_{CE(sat)}$ Transistors



80% lower $V_{CE(sat)}$ than conventional products

Summary

A broad array of surface mount package types are offered, from VMT3 to MPT3. Ideal for portable devices requiring low energy consumption.

Features

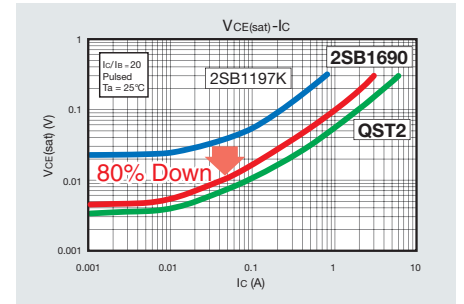
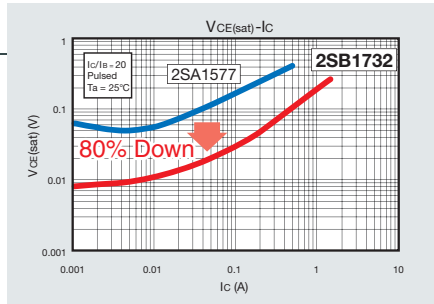
- Low $V_{CE(sat)}$

Applications

- Switching in portable devices
- DC/DC converters

Low $V_{CE(sat)}$

$V_{CE(sat)}$ is reduced by 80% vs. conventional products, contributing to increased power savings. The broad lineup is available in a number of package types, including VMT3 and MPT3 with collector currents up to 6A. Optimized for a variety of applications, especially portables.



Lineup

Single Type (Surface Mount Type)

Package	VMT3		EMT3		UMT3		SMT3		V_{CE0} (V)	I_C (A)	h_{FE}^{*2}
	Polarity		Polarity		Polarity		Polarity				
Application	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
Low $V_{CE(sat)}$	2SA2030	2SC5663	2SA2018	2SC5585	—	—	2SA2119K	—	12	0.5	270 to 680
	—	—	—	—	2SB1689	2SD2652	—	—	12	1.5	270 to 680
	—	—	—	—	—	—	2SB1690K	2SD2653K	12	2	270 to 680
	—	2SD2696	—	—	—	—	—	—	30	0.4	270 to 680
	—	—	—	—	2SB1694	2SD2656	—	—	30	1	270 to 680
—	—	—	—	—	—	2SB1695K	2SD2657K	30	1.5	270 to 680	

Package	TUMT3		TUMT6		TSMT3		TSMT6		MPT3		V_{CE0} (V)	I_C (A)	h_{FE}^{*2}
	Polarity		Polarity		Polarity		Polarity		Polarity				
Application	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
Low $V_{CE(sat)}$	2SB1732	2SD2702	—	—	2SB1709	2SD2674	—	—	—	—	12	1.5	270 to 680
	2SB1730	2SD2700	US6T6	US6X5	2SB1690	2SD2653	QST6	QSX5	2SB1697	2SD2661	12	2	270 to 680
	—	—	US6T4	US6X3	2SB1705	2SD2670	QST4	QSX3	2SB1713	2SD2678	12	3	270 to 680
	—	—	—	—	2SB1707	2SD2672	—	—	—	—	12	4	270 to 680
	—	—	—	—	—	—	QST2	QSX1	—	—	12	6	270 to 680
	2SB1733	2SD2703	—	—	2SB1710	2SD2675	—	—	—	—	30	1	270 to 680
	2SB1731	2SD2701	US6T7	US6X6	2SB1695	2SD2657	QST7	QSX6	2SB1698	2SD2662	30	1.5	270 to 680
	—	—	US6T5	US6X4	2SB1706	2SD2671	QST5	QSX4	2SB1714	2SD2679	30	2	270 to 680
	—	—	—	—	2SB1708	2SD2673	—	—	—	—	30	3	270 to 680
	—	—	—	—	—	—	QST3	QSX2	—	—	30	5	270 to 680

*1 : When mounted on a recommended land pattern.
 *2 : For h_{FE} please refer to the specifications
 Note : (-) symbol omitted for PNP elements.

Dual Type (Surface Mount Type)

Configuration	Package		EMT5 / EMT6	UMT5 / UMT6	SMT5 / SMT6	TUMT5 / TUMT6	TSMT5 / TSMT6	Equivalent Element Transistors	V _{CE0} (V)	I _c (mA)	h _{FE}
	Application	Equivalent Circuit Diagram (TOP View)	Part No.								
PNP×2	Preamp		EMT18	UMT18N	IMT18	—	—	2SA2018×2	−12	−500	270 to 680
	Driver		—	—	—	US6T8	QST8	2SB1709×2	−12	−1.5(A)	270 to 680
—			—	—	US6T9	QST9	2SB1710×2	−30	−1(A)	270 to 680	
NPN×2	Preamp		EMX18	UMX18N	—	—	—	2SC5585×2	12	500	270 to 680
			EMX28	—	—	—	—	2SD2696×2	30	400	270 to 680
	Driver		—	—	—	US6X7	QSX7	2SD2674×2	12	1.5(A)	270 to 680
			—	—	—	US6X8	QSX8	2SD2675×2	30	1(A)	270 to 680
PNP + NPN	Preamp		EMZ7	—	—	—	—	2SA2018 2SC5585	−12 12	−500 500	270 to 680 270 to 680
			EMZ8	—	—	—	—	2SA2018 2SC2412K	−12 50	−500 150	270 to 680 120 to 560
	DC/DC Converter		—	—	—	—	QSZ1	2SB1690 2SD2653	−12 12	−2(A) 2(A)	270 to 680 270 to 680
			—	—	—	—	QSZ2	2SB1695 2SD2657	−30 30	−1.5(A) 1.5(A)	270 to 680 270 to 680
			—	—	—	—	QSZ3	2SB1705 2SD2670	−12 12	−3(A) 3(A)	270 to 680 270 to 680
			—	—	—	—	QSZ4	2SB1706 2SD2671	−30 30	−2(A) 2(A)	270 to 680 270 to 680
PNP+Di	DC/DC Converter		EML4	UML4N	—	—	—	2SA2018 RB521S-30	−12 30	−500 200	270 to 680 —
			—	—	FML9	US5L9	QSL9	2SB1689 RB461F	−12 20	−1.5(A) 700	270 to 680 —
NPN+Di			EML6	UML6N	—	—	—	2SC5585 RB521S-30	12 30	500 200	270 to 680 —
			—	—	FML10	US5L10	QSL10	2SD2652 RB461F	12 20	1.5(A) 700	270 to 680 —
—	—	—	—	—	US5L12	QSL12	2SD2675 RB461F	30 20	1(A) 700	270 to 680 —	

Note : Pin 1 is located at the upper right in the equivalent circuit diagrams for EMT5, EMT6, UMT5, UMT6, TUMT5, TUMT6, TSMT5, and TSMT6
Pin 1 is located at the lower right in the equivalent circuit diagrams for SMT5 and SMT6

High-Speed Switching Transistors : MPT3



Offspeed increased 35%
for greater energy savings

Summary

Optimization of cell structure results in faster switching speeds and lower switching loss, reducing heat generation significantly.

Features

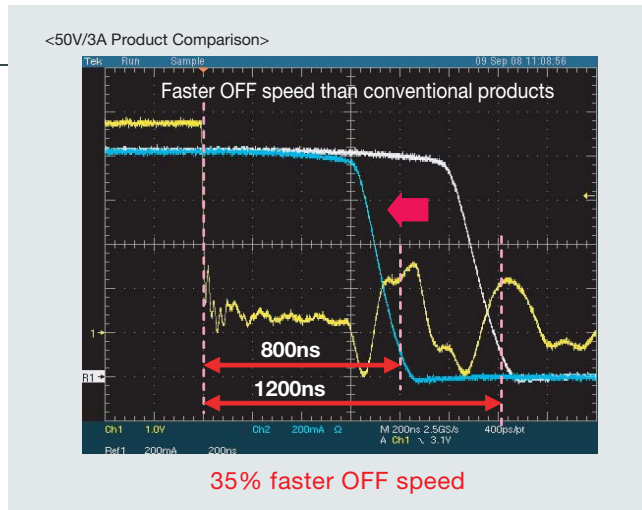
- High-speed switching

Applications

- Buffer circuits
- Motor drive circuits
- Power supplies, and more

High-speed switching

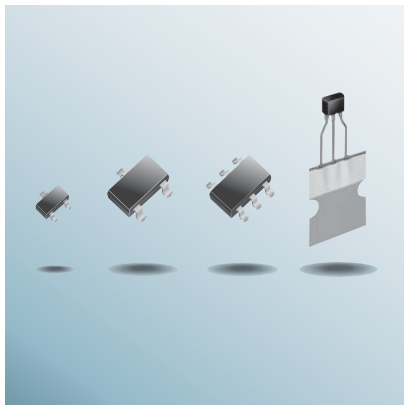
OFF speed increased by 35% for minimum switching loss and heat generation.



Lineup

Part No.	Polarity	V _{CEO} (V)	I _c (A)	h _{FE}
2SAR512P	PNP	-30	-2	200 to 500
2SAR552P			-3	
2SAR542P		-50	-5	180 to 450
2SAR553P			-2	
2SAR533P		-3	120 to 390	
2SAR514P		-0.7		
2SAR554P		-1.5		
2SAR544P		-2.5		
2SCR512P	NPN	30	2	200 to 500
2SCR552P			3	
2SCR542P			5	
2SCR553P		50	2	180 to 450
2SCR533P			3	
2SCR514P		0.7	120 to 390	
2SCR554P		1.5		
2SCR544P		2.5		

Muting Transistors



High h_{FE} · High V_{EBO}

Summary

High h_{FE} and V_{EBO} make this series ideal for audio muting circuits.

Features

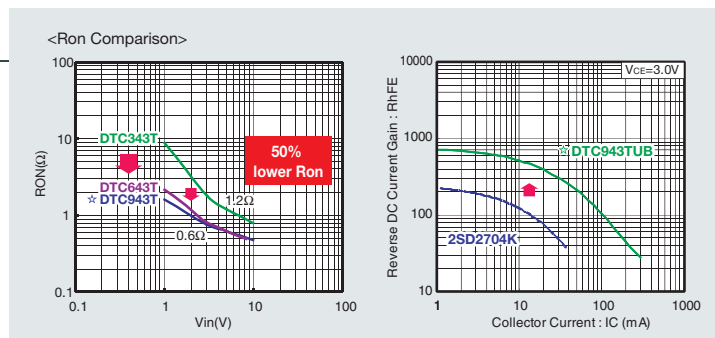
- High h_{FE}
- High V_{EBO}

Applications

- Home audio
- Car audio
- Muting circuit for audio applications

Excellent muting characteristics

ROHM's 40V-class products utilize a high h_{FE} and high V_{EBO} (12V/25V) and feature superior muting characteristics. A variety of package types are available, from the compact surface mount UMT3 to the through-hole SPT, ensuring compatibility with virtually any application.



Lineup

■ Single Type with Built-in Resistor

Part No.	R1 (kΩ)	Equivalent circuit diagram	Package				V_{EBO} (V)	V_{CEO} (V)	I_c (mA)	R_{on} (Ω)
			UMT3F	UMT3	SMT3	SPT				
DTC623T □	2.2		—	●	●	●	12	20	600	0.4
☆ DTC923T □			●	—	—	—	40	20	400	0.6
DTC643T □	4.7		—	●	●	●	12	20	600	0.55
☆ DTC943T □			●	—	—	—	40	20	400	0.6
DTC614T □	10		—	●	●	●	12	20	600	0.9
□ : Packaging designation symbol			UB	U	K	S				

☆ : Under development

■ Dual Type with Built-in Resistor

Part No.	R1 (kΩ)	Equivalent circuit diagram	Equivalent element transistors	Package			V_{EBO} (V)	V_{CEO} (V)	I_c (mA)	R_{on} (Ω)
				SMT6	TUMT6	UMT6				
☆ UMH33	2.2		☆ DTC923T	—	—	●	40	20	400	0.6
☆ UMH32			☆ DTC943T	—	—	●	40	20	400	0.6
US6H23	4.7		DTC643T	—	●	—	12	20	600	0.55
IMH23			●	—	—	12	20	600	0.55	
IMH21	10		DTC614T	●	—	—	12	20	600	0.9

☆ : Under development

■ Single Type

Package				V_{EBO} (V)	V_{CEO} (V)	I_c (mA)	h_{FE}	R_{on} (Ω)
EMT3	UMT3	SMT3	SPT					
—	—	2SD2704K	2SD2705S	25	20	300	820 to 2700	0.7
2SD2654	2SD2351	2SD2226K	2SD2227S	12	50	150	820 to 2700	0.9
—	—	2SD2114K	2SD2144S	12	20	500	560 to 2700	0.8

■ Dual Type

Package		Equivalent circuit diagram	Equivalent element transistors	V_{EBO} (V)	V_{CEO} (V)	I_c (mA)	h_{FE}	R_{on} (Ω)
EMT6	SMT6							
—	IMX25		2SD2704K	25	20	300	820 ~ 2700	0.7
EMX26	—		2SD2654	12	50	150	820 ~ 2700	0.9
—	IMX9		2SD2114K	12	20	500	560 ~ 2700	0.8

Bipolar Transistors

■ Surface Mount Type

Application	VMN3		VMT3		EMT3F		EMT3		V _{CEO} (V)	I _C (A)	h _{FE} *2
	Pc=0.15W *1		Pc=0.15W *1		Pc=0.15W *1		Pc=0.15W *1				
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
General Purpose Amplification	2SA2199	2SC6144	—	—	—	—	—	—	50	0.1	120 to 390
	—	—	2SA2029	2SC5658	2SA1774EB	2SC4617EB	2SA1774	2SC4617	50	0.15	120 to 390
	—	—	—	—	—	—	—	—	120	0.05	180 to 560
Low V _{CE(sat)}	—	—	2SA2030	2SC5663	—	—	2SA2018	2SC5585	12	0.5	270 to 680
	—	—	—	—	—	—	—	—	15	0.5	120 to 560
	—	—	—	—	—	—	—	—	15	1	120 to 270 180 to 390
	—	—	—	—	—	—	—	—	12	1.5	270 to 680
	—	—	—	—	—	—	—	—	12	2	270 to 680
	—	—	—	2SD2696	—	—	—	—	300	0.4	270 to 680
	—	—	—	—	—	—	—	—	30	1	270 to 680
	—	—	—	—	—	—	—	—	30	1.5	270 to 680
Driver	—	—	—	—	—	—	—	—	32	0.5	120 to 390
	—	—	—	—	—	—	—	—	32	0.8	120 to 390
	—	—	—	—	—	—	—	—	50	0.5	120 to 390
	—	—	—	—	—	—	—	—	80	0.5	120 to 390
High-speed Switching	—	—	—	—	—	—	—	—	60	0.5	120 to 270 120 to 390
High h _{FE} and Muting	—	—	—	—	—	—	—	—	25 (V _{EBO})	0.3	820 to 2700
	—	—	—	—	—	—	—	—	20	0.5	820 to 2700
	—	—	—	2SD2707	—	—	—	2SD2654	50	0.15	820 to 2700
High Breakdown Voltage	—	—	—	—	—	—	—	—	300	0.1	56 to 120
High Frequency	—	—	—	2SC5659	—	—	—	2SC4618	25	0.05	82 to 180 (f _T =300MHz)
	—	—	—	—	—	—	—	—	6	0.05	180 to 560 (f _T =800MHz)
	—	—	—	2SC5661	—	—	—	2SC4725	20	0.05	82 to 180 (f _T =1500MHz)
	—	—	—	2SC5662	—	—	—	2SC4726	11	0.05	56 to 180 (f _T =3200MHz)
Darlington*3	—	—	—	—	—	—	—	—	32	0.3	5k or more
	—	—	—	—	—	—	—	—	32 (V _{CES})	0.3	5k or more




*1 : When mounted on a recommended land pattern

*2 : For h_{FE}, please refer to the specifications

*3 : For the internal circuit, please refer to the specifications

Note : (-) symbol omitted for PNP elements

■ Surface Mount Type

Package	UMT3F		UMT3		SMT3		V _{CEO} (V)	I _C (A)	h _{FE} *2
	 P _C =0.2W*1		 P _C =0.2W*1		 P _C =0.2W*1				
Application	PNP	NPN	PNP	NPN	PNP	NPN			
General Purpose Amplification	—	—	—	—	—	—	50	0.1	120 to 390
	2SA1576UB	2SC4081UB	2SA1576A	2SC4081	2SA1037AK	2SC2412K	50	0.15	120 to 390
	—	—	2SA1579	2SC4102	2SA1514K	2SC3906K	120	0.05	180 to 560
Low V _{CE(sat)}	—	—	—	—	2SA2119K	—	12	0.5	270 to 680
	—	—	—	—	—	2SD1757K	15	0.5	120 to 560
	—	—	—	—	2SB1590K	2SD2444K	15	1	120 to 270/ 180 to 390
	—	—	2SB1689	2SD2652	—	—	12	1.5	270 to 680
	—	—	—	—	2SB1690K	2SD2653K	12	2	270 to 680
	—	—	—	—	—	—	30	0.4	270 to 680
	—	—	2SB1694	2SD2656	—	—	30	1	270 to 680
	—	—	—	—	2SB1695K	2SD2657K	30	0.5	270 to 680
Driver	—	—	2SA1577	2SC4097	2SA1036K	2SC2411K	32	0.5	120 to 390
	—	—	—	—	2SB1197K	2SD1781K	32	0.8	120 to 390
	—	—	—	2SD1949	—	2SD1484K	50	0.5	120 to 390
	—	—	—	—	2SB1198K	2SD1782K	80	0.5	120 to 390
High-speed Switching	—	—	2SA2088	2SC5876	—	—	60	0.5	120 to 270/ 120 to 390
High h _{FE} and Muting	—	—	—	—	—	2SD2704K	25 (V _{EBO})	0.3	820 to 2700
	—	—	—	—	—	2SD2114K	20	0.5	820 to 2700
	—	—	—	2SD2351	—	2SD2226K	50	0.15	820 to 2700
High Breakdown Voltage	—	—	—	—	—	2SC4061K	300	0.1	56 to 120
High Frequency	—	—	—	2SC4098	—	2SC2413K	25	0.05	82 to 180 (f _T =300MHz)
	—	—	—	2SC4774	—	2SC4713K	6	0.05	180 to 560 (f _T =800MHz)
	—	—	—	2SC4082	—	2SC3837K	20	0.05	82 to 180 (f _T =1500MHz)
	—	—	—	2SC4083	—	2SC3838K	11	0.05	56 to 180 (f _T =3200MHz)
Darlington*3	—	—	—	—	—	2SD2142K	30	0.3	5k or more
	—	—	—	—	2SB852K	2SD1383K	32 (V _{CES})	0.3	5k or more

*1 : When mounted on a recommended land pattern

*2 : For h_{FE}, please refer to the specifications

*3 : For the internal circuit, please refer to the specifications

Note : (-) symbol omitted for PNP elements



■ Surface Mount Type

Package	TUMT3		TUMT6		TSMT3		TSMT6		V _{CEO} (V)	I _C (A)	h _{FE} *2
	Pc=0.4W		Pc=0.4W		Pc=0.5W		Pc=0.5W				
Application	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
Low V _{CE} (sat)	2SB1732	2SD2702	—	—	2SB1709	2SD2674	—	—	12	1.5	270 to 680
	2SB1730	2SD2700	US6T6	US6X5	2SB1690	2SD2653	QST6	QSX5	12	2	270 to 680
	—	—	US6T4	US6X3	2SB1705	2SD2670	QST4	QSX3	12	3	270 to 680
	—	—	—	—	2SB1707	2SD2672	—	—	12	4	270 to 680
	—	—	—	—	—	—	QST2	QSX1	12	6	270 to 680
	2SB1733	2SD2703	—	—	2SB1710	2SD2675	—	—	30	1	270 to 680
	2SB1731	2SD2701	US6T7	US6X6	2SB1695	2SD2657	QST7	QSX6	30	1.5	270 to 680
	—	—	US6T5	US6X4	2SB1706	2SD2671	QST5	QSX4	30	2	270 to 680
Driver	—	—	—	—	☆2SAR543R	☆2SCR543R	—	—	50	3.5	180 to 450
	—	—	—	—	New 2SAR544R	New 2SCR544R	—	—	80	2.5	120 to 390
High-speed Switching	—	—	—	—	2SA2090	2SC5868	—	—	60	0.5	120 to 270/ 120 to 390
	—	—	—	—	2SA2092	2SC5865	—	—	60	1	120 to 270/ 120 to 390
—	—	—	—	2SA2094	2SC5866	—	—	60	2	120 to 270/ 120 to 390	

Package	MPT3		CPT3		V _{CEO} (V)	I _C (A)	h _{FE} *2
	Pc=0.5W		Pc=1W				
Application	PNP	NPN	PNP	NPN			
Low V _{CE} (sat)	2SB1697	2SD2661	—	—	12	2	270 to 680
	2SB1713	2SD2678	—	—	12	3	270 to 680
	2SB1424	2SD2150	—	—	20	3	180 to 390/ 120 to 390
	—	—	2SB1412	2SD2118	20	5	120 to 390
	—	—	2SA1834	2SC5001	20	10	180 to 560/ 120 to 390
	2SB1698	2SD2662	—	—	30	1.5	270 to 680
2SB1714	2SD2679	—	—	30	2	270 to 680	
Driver	New 2SAR512P	New 2SCR512P	—	—	30	2	200 to 500
	New 2SAR552P	New 2SCR552P	—	—	30	3	200 to 500
	New 2SAR542P	New 2SCR542P	—	—	30	5	200 to 500
	2SB1132	2SD1664	—	—	32	1	120 to 390
	2SB1188	2SD1766	2SB1182	2SD1758	32	2	120 to 390
	☆2SAR513P	☆2SCR513P	—	—	50	1	180 to 450
	New 2SAR553P	New 2SCR553P	—	—	50	2	180 to 450
	New 2SAR533P	New 2SCR533P	—	—	50	3	180 to 450
	—	—	2SB1184	2SD1760	50	3	120 to 390
	2SB1561	2SD2391	—	—	60	2	120 to 270
	—	—	2SA1952	2SC5103	60	5	120 to 270
	New 2SAR514P	New 2SCR514P	—	—	80	0.7	120 to 390
2SB1260	2SD1898	2SB1181	2SD1733	80	1	120 to 390	
New 2SAR554P	New 2SCR554P	—	—	80	1.5	120 to 390	
New 2SAR544P	New 2SCR544P	—	—	80	2.5	120 to 390	
—	—	2SB1275	2SD1918	160	1.5	82 to 180/ 120 to 270	
High-speed Switching	2SA2071	2SC5824	2SA2072	2SC5825	60	3	120 to 270/ 120 to 390
High h _{FE}	—	2SD2537	—	—	25	1.2	820 to 1800
	2SB1427	—	—	—	20	2	390 to 820
	—	2SD2153	—	—	25	2	820 to 1800
	—	—	—	2SD2318	60	3	560 to 1800
Darlington*3	—	2SD1834	—	—	60 (V _{GES})	1	2k or more
	—	—	—	2SD2143	60±10	2	1k to 10k
—	—	2SB1316	2SD1980	100	2	1k to 10k	

*1 : When mounted on a recommended land pattern
 *2 : For h_{FE}, please refer to the specifications
 *3 : For the internal circuit, please refer to the specifications
 Note : (-) symbol omitted for PNP elements
 ☆ : Under development

■ Leded Type

Package	SPT		ATV		V_{CE0} (V)	I_C (A)	h_{FE}^{*3}
	 $P_C=0.3W$ ^{*1}		 $P_C=1W$ ^{*2}				
Polarity	PNP	NPN	PNP	NPN			
Application	PNP	NPN	PNP	NPN			
General Purpose Amplification	2SA1038S	2SC2389S	—	—	120	0.05	180 to 560
Low $V_{CE(sat)}$	—	2SD1468S ^{*5}	—	—	15	1	120 to 390
	—	2SD2687S ^{*5}	—	—	12	5	350 to 680
	2SA1585S ^{*5}	2SC4115S ^{*5}	—	—	20	2	120 to 390
Driver	2SA854S	2SC1741S	—	—	32	0.5	120 to 390
	2SA1515S	—	2SB1237	2SD1858	32	1	120 to 390
	—	—	2SB1240	2SD1862	32	2	120 to 390
	—	2SC1741AS	—	—	50	0.5	120 to 390
	—	—	2SB1443	—	50	3	120 to 270
	—	—	2SB1243	2SD1864	50	3	120 to 390
	—	—	2SB1238	2SD1859	80	0.7	120 to 390
	—	2SD1768S	2SB1241	2SD1863	80	1	120 to 390
	—	—	2SB1236	2SD1857	120	1.5 / 2	120 to 390
High-speed Switching	—	—	2SA2093	2SC5880	60	2	120 to 270/ 120 to 390
	—	—	2SA2073	2SC5826	60	3	120 to 270/ 120 to 390
High h_{FE} and Muting	—	2SD2705S	—	—	$\frac{25}{(V_{EBO})}$	0.3	820 to 2700
	—	2SD2144S	—	—	20	0.5	820 to 2700
	—	2SD2227S	—	—	50	0.15	820 to 2700
High Breakdown Voltage	—	2SC3415S	—	2SC4015	300	0.1	56 to 120
High Frequency	—	2SC2058S	—	—	25	0.05	$\frac{82}{(f_T=300MHz)}$
Darlington ^{*4}	—	—	—	2SD1866	60 ± 10	2	1k to 10k
	—	—	—	2SC5060	90 ± 10	1	1k to 2.5k
	—	—	—	2SD1867	100	2	1k to 10k

*1 : When mounted on a recommended land pattern

*2 : When mounted on a 1.7mm board with copper foil no greater than cm^2 in area

*3 : For h_{FE} , please refer to the specifications






























*4 : For the internal circuit, please refer to the specifications

*5 : $P_C=0.4W$ supplied

Note : (-) symbol omitted for PNP elements

Complex Bipolar Transistors

■ Surface Mount Type

Configuration	Package	Item	Equivalent circuit diagram (TOP View)	VT6	EMT5 / EMT6	UMT5 / UMT6	SMT5 / SMT6	TUMT5 / TUMT6	TSMT5 / TSMT6	MPT6	Equivalent transistors	V _{CEO} (V)	I _C (mA)	h _{FE}			
																	
PNP×2	Preamp			—	EMT1	UMT1N	IMT1A	—	—	—	2SA1037AK×2	-50	-150	120 or more			
				—	—	—	IMT17	—	—	—	2SA1036K×2	-50	-500	120 to 390			
				—	EMT18	UMT18N	IMT18	—	—	—	2SA2018×2	-12	-500	270 to 680			
				—	—	—	—	—	—	MP6T1	2SB1132×2	-32	-1(A)	120 to 390			
				—	—	—	—	—	—	MP6T2	2SB1188×2	-32	-2(A)	120 to 390			
				—	—	—	—	—	—	MP6T3	2SA2071×2	-60	-3(A)	120 to 270			
	Driver			—	—	—	—	—	—	—	—	—	-20	-200	120 to 560		
				—	—	—	—	—	—	—	—	—	—	-50	-100	120 to 560	
				—	EMT2	UMT2N	IMT2A	—	—	—	2SA1037AK×2	-50	-150	120 to 560			
				—	EMT3	—	IMT3A	—	—	—	2SA1037AK×2	-50	-150	120 to 560			
				—	—	—	IMT4	—	—	—	2SA1514K×2	-120	-50	180 or more			
				—	—	—	—	—	US6T8	—	2SB1709×2	-12	-1.5(A)	270 to 680			
Ideal for Current Mirrors			—	—	—	—	—	—	—	—	—	-30	-1(A)	270 to 680			
			—	—	—	—	—	—	—	—	—	—	—	-20	-200	120 to 560	
NPX×2	Preamp			—	EMX1	UMX1N	IMX1	—	—	—	2SC2412K×2	50	150	120 or more			
				—	EMX26	—	—	—	—	—	2SD2654×2	50	150	820 to 2700			
				—	EMX18	UMX18N	—	—	—	—	2SC5585×2	12	500	270 to 680			
				—	—	—	IMX9	—	—	—	2SD2114K×2	20	500	560 to 2700			
				—	—	—	IMX25	—	—	—	2SD2704K×2	20	300	820 to 2700			
				—	EMX28	—	—	—	—	—	2SD2696×2	30	400	270 to 680			
	Ideal for Current Mirrors			—	—	—	IMX17	—	—	—	2SD1484K×2	50	500	120 to 390			
				—	—	—	—	—	—	—	—	—	—	—	—	—	
				—	—	—	—	—	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—	—	—	—	—
Preamp			—	—	—	—	—	—	—	—	—	—	—	—			
			—	—	—	—	—	—	—	—	—	—	—	—	—		
			—	—	—	—	—	—	—	—	—	—	—	—	—	—	
			—	—	—	—	—	—	—	—	—	—	—	—	—	—	
			—	—	—	—	—	—	—	—	—	—	—	—	—	—	
			—	—	—	—	—	—	—	—	—	—	—	—	—	—	
High Frequency			—	—	—	—	—	—	—	—	—	—	—	—			
			—	—	—	—	—	—	—	—	—	—	—	—			
Driver			—	—	—	—	—	—	—	—	—	—	—	—			
			—	—	—	—	—	—	—	—	—	—	—	—			
PNP + NPN	Amplifier			—	EMY1	UMY1N	FMY1A	—	—	—	2SA1037AK	-50	-150	120 or more			
				—	—	—	FMY4A	—	—	—	2SA1037AK	-50	-150	120 to 560			
	Preamp			—	—	—	—	—	—	—	—	—	—	—			
				—	EMZ1	UMZ1	IMZ1A	—	—	—	2SA1037AK	-50	-150	120 or more			
				—	EMZ7	—	—	—	—	—	2SC2412K	50	150	120 to 560			
				—	—	—	IMZ4	—	—	—	2SA2018	-12	-500	270 to 680			
				—	—	—	—	—	—	—	2SC5585	12	500	500			
				—	—	—	—	—	—	—	2SA1036K	-32	-500	180 to 390			
	DC/DC Converter			—	—	—	—	—	—	—	—	—	—	—			
				—	—	—	—	—	—	—	—	—	—	—	—		
				—	—	—	—	—	—	—	—	—	—	—	—	—	
				—	—	—	—	—	—	—	—	—	—	—	—	—	
—				—	—	—	—	—	—	—	—	—	—	—	—		
—				—	—	—	—	—	—	—	—	—	—	—	—		

Pin 1 is located at the upper right in the equivalent circuit diagrams for EMT5, EMT6, UMT5, UMT6, TUMT5, TUMT6, TSMT5, and TSMT6
Pin 1 is located at the lower right in the equivalent circuit diagrams for SMT5 and SMT6

■ Surface Mount Type

Configuration	Package	Application	Equivalent circuit diagram (TOP View)	EMT5 / EMT6	UMT5 / UMT6	SMT5 / SMT6	TUMT5 / TUMT6	TSMT5 / TSMT6	Equivalent transistors	V _{CE0} (V)	I _c (mA)	h _{FE}
				Part No.								
PNP+DTR	Power Management			EMF5	UMF5N	—	—	—	2SA2018 DTC144E	-12 50	-500 100	270 to 680 68 or more
			—	UMF28N	—	—	—	2SA1774 DTC124X	-50 50	-150 100	180 to 390 68 or more	
PNP + N-ch MOS			EMF6	UMF6N	—	—	—	2SA2018 2SK3019	-12 30	-500 100	270 to 680 —	
		PNP-DTR + N-ch MOS		EMF32	UMF32N	—	—	—	DTA143T 2SK3019	-50 30	-100 100	100 to 600 —
			EMF33	—	—	—	—	DTB513Z 2SK3019	-12 30	-500 100	140 or more —	
NPN+DTR			EMF8	UMF8N	—	—	—	2SC5585 DTC144E	12 50	500 100	270 to 680 60 or more	
NPN + N-ch MOS		EMF9	UMF9N	—	—	—	2SC5585 2SK3019	12 30	500 100	270 to 680 —		
PNP+Di	DC/DC Converter			—	UML1N	—	—	—	2SA1774 DAN202K	-50 80	-150 100	120 or more —
				—	UML4N	—	—	—	2SA2018 RB521S-30	-12 30	-500 200	270 to 680 —
			—	—	FML9	US5L9	QSL9	2SB1689 RB461F	-12 20	-1.5(A) 700	270 to 680 —	
			—	—	—	—	QSL11	2SB1710 RB461F	-30 20	-1(A) 700	270 to 680 —	
PNP-DTR + Di			EML17	—	—	—	—	DTA144E RB520G-30	-50 30	-100 100	68 or more —	
NPN+Di			—	UML2N	—	—	—	2SC4617 DAN202K	50 80	150 100	120 or more —	
		—	UML6N	—	—	—	2SC5585 RB521S-30	12 30	500 200	270 to 680 —		
		—	—	FML10	US5L10	QSL10	2SD2652 RB461F	12 20	1.5(A) 700	270 to 680 —		
		—	—	—	—	QSL12	2SD2675 RB461F	30 20	1(A) 700	270 to 680 —		
NPN-DTR + Di		EML20	—	—	—	—	DTC123J RB521S-30	50 30	100 100	80 or more —		
NPN+Di	Shunt Regulator		<i>New</i> EML22	<i>New</i> UML23N	—	—	—	2SC2412K VDZ6.8B	50 V _Z =6.8	150 I _Z =5	120 to 270 —	

Pin 1 is located at the upper right in the equivalent circuit diagrams for EMT5, EMT6, UMT5, UMT6, TUMT5, TUMT6, TSMT5, and TSMT6
 Pin 1 is located at the lower right in the equivalent circuit diagrams for SMT5 and SMT6

Digital Transistors

Surface Mount Type

Specifications	Item	Part No.		R1 (kΩ)	R2 (kΩ)	Package								V _{CC} (V _{CE0}) (V)	I _o (I _c) (mA)	G _I (h _{FE})	
		PNP	NPN			VMN3	VMT3	EMT3F	EMT3	UMT3F	UMT3	SMT3	MPT3				
		Type				Pd=150mW				Pd=200mW			Pd=500mW				
R1 = R2 Potential Divider Type	100mA	DTA123E□A	DTC123E□A	2.2	2.2	—	●	—	●	—	●	●	—	50	100	20 or more	
		DTA143E□A	DTC143E□A	4.7	4.7	—	●	—	●	—	●	●	—	50	100	20 or more	
		DTA114E□A	DTC114E□A	10	10	●	●	●	●	●	●	—	—	50	50	30 or more	
		DTA124E□A	DTC124E□A	22	22	—	●	●	●	●	●	—	—	50	30	56 or more	
		DTA144E□A	DTC144E□A	47	47	●	●	—	●	●	●	—	—	50	30	68 or more	
		DTA115E□A	DTC115E□A	100	100	—	●	—	●	—	●	—	—	50	20	82 or more	
	200mA	DTB743E□	DTD743E□	4.7	4.7	—	●	—	—	—	—	—	—	30	200	120 or more	
		DTB543E□	DTD543E□	4.7	4.7	—	●	—	—	—	—	—	—	12	500	120 or more	
		DTB113E□	DTD113E□	1	1	—	—	—	—	—	●	—	—	50	500	33 or more	
		DTB123E□	DTD123E□	2.2	2.2	—	—	—	—	—	●	—	—	50	500	39 or more	
		DTB143E□	DTD143E□	4.7	4.7	—	—	—	—	—	●	—	—	50	500	47 or more	
		DTB114E□	DTD114E□	10	10	—	—	—	—	—	●	—	—	50	500	56 or more	
R1 ≠ R2 Leak Absorption Type	100mA	DTA113Z□A	DTC113Z□A	1	10	—	—	—	DTA only	—	●	●	—	50	100	33 or more	
		DTA123Y□A	DTC123Y□A	2.2	10	—	—	—	●	—	●	●	—	50	100	33 or more	
		DTA123J□A	DTC123J□A	2.2	47	—	●	●	●	●	●	—	—	50	100	80 or more	
		DTA143X□A	DTC143X□A	4.7	10	—	●	●	●	●	●	—	—	50	100	30 or more	
		DTA143Z□A	DTC143Z□A	4.7	47	—	●	●	●	●	●	—	—	50	100	80 or more	
		DTA114W□A	DTC114W□A	10	4.7	—	—	—	●	—	●	—	—	50	100	24 or more	
		DTA114Y□A	DTC114Y□A	10	47	—	●	●	●	●	●	—	—	50	70	68 or more	
		DTA124X□A	DTC124X□A	22	47	—	●	—	●	—	●	—	—	50	50	68 or more	
		DTA144V□A	DTC144V□A	47	10	—	—	—	—	—	DTC only	●	—	50	100	33 or more	
		DTA144W□A	DTC144W□A	47	22	—	—	—	—	—	●	—	—	50	30	56 or more	
	200mA	DTB713Z□	DTD713Z□	1	10	—	●	—	●	—	—	—	—	30	200	140 or more	
		DTB723Y□	DTD723Y□	2.2	10	—	●	—	●	—	—	—	—	30	200	140 or more	
		DTB743X□	DTD743X□	4.7	10	—	●	—	●	—	—	—	—	30	200	140 or more	
		DTB743Z□	DTD743Z□	4.7	47	—	●	—	●	—	—	—	—	30	200	150 or more	
		DTB513Z□	DTD513Z□	1	10	—	—	—	—	—	—	—	—	12	500	140 or more	
		DTB523Y□	DTD523Y□	2.2	10	—	●	—	●	—	—	—	—	12	500	140 or more	
	500mA	DTB543X□	DTD543X□	4.7	10	—	●	—	●	—	—	—	—	12	500	140 or more	
		DTB543Z□	DTD543Z□	4.7	47	—	●	—	●	—	—	—	—	12	500	150 or more	
		DTB113Z□	DTD113Z□	1	10	—	—	—	—	—	DTD only	●	—	50	500	56 or more	
		DTB123Y□	DTD123Y□	2.2	10	—	—	—	—	—	DTB only	●	—	50	500	56 or more	
1A	—	DTDG23YP*1	2.2	10	—	—	—	—	—	—	●	60±10	1(A)	300 or more			
Type using R1 alone as Input Resistor	100mA	DTA113TKA	—	1	—	—	—	—	—	—	—	●	—	50	100	100 to 600	
		—	DTC123TKA	2.2	—	—	—	—	—	—	—	—	●	—	50	100	100 to 600
		DTA143T□A	DTC143T□A	4.7	—	—	—	●	●	●	●	—	—	50	100	100 to 600	
		DTA114T□A	DTC114T□A	10	—	—	—	●	●	●	●	—	—	50	100	100 to 600	
		DTA124T□A	DTC124T□A	22	—	—	—	●	—	●	●	—	—	50	100	100 to 600	
		DTA144T□A	DTC144T□A	47	—	—	—	●	—	●	●	—	—	50	100	100 to 600	
	500mA	DTA115T□A	DTC115T□A	100	—	—	—	●	—	●	●	—	—	50	100	100 to 600	
		DTA125T□A	DTC125T□A	200	—	—	—	—	—	—	●	—	—	50	100	100 to 600	
		DTB123TK	DTD123T□	2.2	—	—	—	—	—	—	—	—	—	40	500	100 to 600	
		DTB143TK	DTD143TK	4.7	—	—	—	—	—	—	—	—	—	40	500	100 to 600	
		DTB114TK	—	10	—	—	—	—	—	—	—	—	—	40	500	100 to 600	
		—	DTC614T□	10	—	—	—	—	—	—	—	●	●	—	20	600	820 to 2700
For Muting	—	DTC623T□	2.2	—	—	—	—	—	—	—	●	●	—	20	600	820 to 2700	
	—	DTC643T□	4.7	—	—	—	—	—	—	—	●	●	—	20	600	820 to 2700	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Type using R2 alone as Bleeder Resistor	100mA	DTA114G□A	DTC114G□A	—	10	—	—	—	—	—	●	●	—	50	100	30 or more	
		DTA124G□A	DTC124G□A	—	22	—	—	—	—	—	DTC only	●	—	50	100	68 or more	
		DTA144G□A	DTC144G□A	—	47	—	—	—	DTC only	—	●	●	—	50	100	68 or more	
	DTA115G□A	DTC115G□A	—	100	—	—	—	—	—	●	—	—	50	100	68 or more		
	500mA	DTB114GK	DTD114GK	—	10	—	—	—	—	—	—	—	—	—	500	56 or more	
1A	—	DTDG14GP*1	—	10	—	—	—	—	—	—	—	—	60±10	1(A)	300 or more		

□ : Package designations symbol

*1 : For the internal circuit, please refer to the specifications

Notes : Part numbers for VMN3, VMT3, EMT3F, EMT3, and UMT3F do not have the suffix 'A'

(-) symbol omitted for PNP elements

Complex Digital Transistors

■ Surface Mount Type

Configuration	Package	Item	Equivalent circuit diagram (TOP View)	EMT5 / 6	UMT5 / 6	SMT5 / 6	TUMT5 / 6	TSMT6	MPT6	Equivalent transistors			
				Part No.									
PNP × 2	Application	Potential Divider Type		— EMA2	UMA1N UMA2N	FMA1A FMA2A	—	—	—	DTA124EX2 DTA144EX2			
		Leak Absorption Type		— EMA5	UMA9N UMA5N	FMA9A FMA5A	—	—	—	DTA114EX2 DTA123JX2			
		Input Resistor Type		EMA3 EMA4	UMA3N UMA4N	FMA3A FMA4A	—	—	—	DTA143TX2 DTA114TX2			
		Potential Divider Type		EMB2 EMB11	UMB2N UMB11N	IMB2A IMB11A	—	—	—	DTA144EX2 DTA114EX2			
		Potential Divider Type		EMB10	UMB10N	IMB10A	—	—	—	DTA123JX2			
		Potential Divider Type		EMB6	UMB6N	—	—	—	—	DTA144EX2			
		Input Resistor Type		EMB3	UMB3N	IMB3A	—	—	—	DTA143TX2			
NPN × 2	Application	Potential Divider Type		EMG1 EMG2 EMG9	UMG1N UMG2N UMG9N	FMG1A FMG2A FMG9A	—	—	—	DTC124EX2 DTC144EX2 DTC114EX2			
		Input Resistor Type		EMG3 EMG4 EMG6	UMG3N UMG4N UMG6N	FMG3A FMG4A FMG6A	—	—	—	DTC143TX2 DTC114TX2 DTC144TX2			
		Potential Divider Type		EMH1 EMH2 EMH11	UMH1N UMH2N UMH11N	IMH1A IMH2A IMH11A	—	—	—	DTC124EX2 DTC144EX2 DTC114EX2			
		Leak Absorption Type		EMH9	UMH9N	IMH9A	—	—	—	DTC114YX2			
		Potential Divider Type		— EMH6	UMH5N UMH6N	IMH 5A IMH6A	—	—	—	DTC124EX2 DTC144EX2			
		Input Resistor Type		EMH3 EMH4 EMH15	UMH3N UMH4N —	IMH3A IMH4A IMH15A	—	—	—	—	DTC143TX2 DTC114TX2 DTC144TX2		
				— —	— —	IMH21 IMH23	—	—	—	—	DTC614TX2 DTC643TX2		
				—	UMH8N	IMH8A	—	—	—	—	DTC114TX2		
				—	UMH14N	IMH14A	—	—	—	—	DTC144TX2		
		Driver		—	—	—	—	—	QSH29	—	DTDG14GPX2 (500mA)		
				—	—	—	—	—	—	MP6H1	DTDG14GPX2		
		PNP + NPN	Application	Potential Divider Type		EMD2 EMD3 EMD4	UMD2N UMD3N UMD4N	IMD2A IMD3A —	—	—	—	DTA124E DTC124E DTA114E DTC114E	
						EMD12 EMD5	UMD12N UMD5N	— —	—	—	—	—	DTA114Y DTC144E DTA144E DTC144E
						EMD9 EMD22 EMD38	UMD9N UMD22N —	IMD9A — —	—	—	—	—	DTA114Y DTC114Y DTA143Z DTC143Z DTA113Z DTC114Y
	EMD6				UMD6N	IMD6A	—	—	—	—	DTA143T DTC143T		
Leak Absorption Type				EMD29 EMD30	— —	— —	—	—	—	—	DTB513Z DTC114E DTB713Z DTC114E		
				— —	— —	IMD10A IMD16A	—	—	—	—	— DTC114T — DTC115T		

Pin 1 is located at the upper right in the equivalent circuit diagrams for EMT5, EMT6, UMT5, UMT6, TUMT5, TUMT6, TSMT5, and TSMT6
 Pin 1 is located at the lower right in the equivalent circuit diagrams for SMT5 and SMT6.

Dimensions

VMN3 	VMT3 	VMT6 	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 				
CPT3 (SC-63) (SOT-428) 	TCPT3 	LPTS 	LPTL 			
SPT (SC-72) 	ATV 	TO-220FN 	TO-220FM 	TO-3PF 		

Notes : 1) Characters in () under package designation signify the JEITA No. while characters in < > denote the JEDEC No.
2) For more detailed of dimensions, please refer to the technical specifications.

Part No. Explanation

Bipolar Transistor Part No. Explanation

Part No. Taping Code

例) **2 S C 2 4 1 2 K** **T 1 4 6 R**

• hFE Ranking code

Code	hFE Range
A	16 to 32
B	25 to 50
C	60 to 120
D	100 to 200
E	160 to 320
M	39 to 82
N	56 to 120
P	82 to 180
Q	120 to 270
R	180 to 390
S	270 to 560
E	390 to 820
U	560 to 1200
V	820 to 1800
W	1200 to 2700

Digital Transistor Part No. Explanation

Example : **DT** Digital Transistor

1	General use
3	Muting
5	Low V _{CE} (sat) 12V
7	Low V _{CE} (sat) 30V

3	10 ³
4	10 ⁴
5	10 ⁵

B	VMN3
M	VMT3
EB	EMT3F
E	EMT3
UB	UMT3F
U	UMT3
K	SMT3
P	MPT3

Exponent Specification Exponent of R₁ Resistance Value Package Taping Code

D T A 1 2 4 E K A T 1 4 6

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Polarity	Basic R ₁ Resistance Value	Resistance Ratio R ₁ / R ₂	Suffix (except VMN3, VMT3, EMT3F, EMT3, UMT3F)
A	1 1.0	E R ₁ / R ₂ = 1 / 1	X R ₁ / R ₂ = 1 / 2
B	2 2.2	Y R ₁ / R ₂ = 1 / 5	Z R ₁ / R ₂ = 1 / 10
C	4 4.7	J R ₁ / R ₂ = 1 / 20	W R ₁ / R ₂ = 2 / 1
D	6 6.8	V R ₁ / R ₂ = 5 / 1	T R ₁ only
		G R ₂ only	

Note : ④ and ⑤ together represent the R₁ resistance value

Example

24	2.2 × 10 ⁴ Ω = 22kΩ
43	4.7 × 10 ³ Ω = 4.7kΩ

Packing type

Package	Code	Packaging style	Direction	Basic ordering unit (pcs)
VMN3	T2L	Embossed tape	One terminal on sprocket hole side	8,000
VMT3	T2L	Embossed tape	One terminal on sprocket hole side	8,000
VMT6	T2R	Embossed tape	Terminal No.1 on sprocket hole side	8,000
EMT3F	TL	Embossed tape	One terminal on sprocket hole side	3,000
EMT3	TL	Embossed tape	One terminal on sprocket hole side	3,000
EMT5	T2R	Embossed tape	Three terminals on sprocket hole side	8,000
EMT6	T2R	Embossed tape	Terminal No.1 on sprocket hole side	8,000
UMT3F	TL	Embossed tape	One terminal on sprocket hole side	3,000
UMT3	T106	Embossed tape	One terminal on sprocket hole side	3,000
UMT5	TR	Embossed tape	Three terminals on sprocket hole side	3,000
UMT6	TR	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	TN	Embossed tape	Non-directional	3,000
WEMT6	T2R	Embossed tape	Terminal No.1 on sprocket hole side	8,000
TUMT3	TL	Embossed tape	One terminal on sprocket hole side	3,000
TUMT5	TR	Embossed tape	Terminal No.1 on sprocket hole side	3,000
TUMT6	TR	Embossed tape	Terminal No.1 on sprocket hole side	3,000
SST3	T116	Embossed tape	One terminal on sprocket hole side	3,000
SMT3	T146	Embossed tape	One terminal on sprocket hole side	3,000
SMT5	T148	Embossed tape	Three terminals on sprocket hole side	3,000
SMT6	T108	Embossed tape	Terminal No.1 on opposite side from sprocket hole side	3,000
	T110	Embossed tape	Non-directional	3,000
TSST8	TL	Embossed tape	One terminal on sprocket hole side	3,000
TSMT3	TL	Embossed tape	One terminal on sprocket hole side	3,000
TSMT5	TR	Embossed tape	Terminal No.1 on sprocket hole side	3,000
TSMT6	TR	Embossed tape	Terminal No.1 on sprocket hole side	3,000
TSMT8	TR	Embossed tape	Terminal No.1 on sprocket hole side	3,000
SOP8	TB	Embossed tape	Terminal No.1 on sprocket hole side	2,500
MPT3	T100	Embossed tape	Three terminals on sprocket hole side	1,000
MPT6	TR	Embossed tape	Terminal No.1 on sprocket hole side	1,000
CPT3	TL	Embossed tape	Fin on sprocket hole side	2,500
TCPT3	TL	Embossed tape	One terminal on sprocket hole side	2,500
LPT	TL	Embossed tape	Fin on sprocket hole side	1,000
SPT	TP	Radial tape	Ammo Box	5,000
ATV	TV2	Radial tape	Ammo Box	2,500
TO-220FN	—	Bulk	Box	500
TO-220FM	—	Bulk	Box	500
TO-3PF	—	Bulk	Tube	360

MEMO

MEMO

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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
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