2SK2869

Silicon N Channel MOS FET
High Speed Power Switching

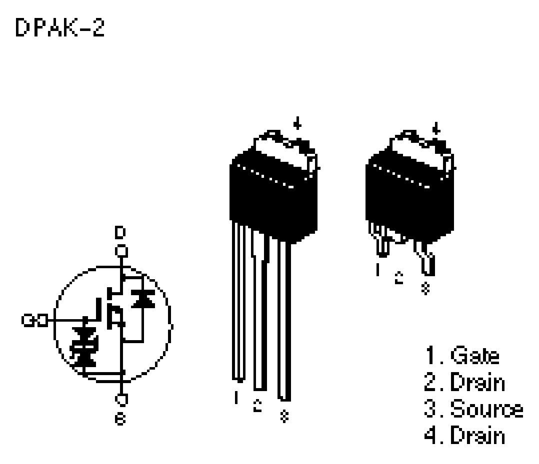
HITACHI

ADE-208-570
1st. Edition

Features

- Low on-resistance
  $R_{DS} = 0.033\ \Omega$ typ.
- High speed switching
- 4V gate drive device can be driven from 5V source

Outline



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Absolute Maximum Ratings (Ta = 25°C)

Item	**Symbol**	**Ratings**	**Unit**
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	20	A
Drain peak current	$I_{D(pulse)}$*[1]	80	A
Body to drain diode reverse drain current	I_{DR}	20	A
Avalanche current	I_{AP}*[3]	20	A
Avalanche energy	E_{AR}*[3]	34	mJ
Channel dissipation	Pch*[2]	30	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

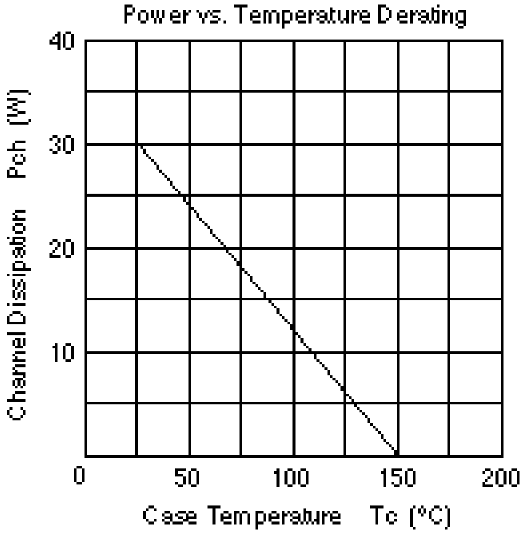
Notes:
1. PW ≤ 10µs, duty cycle ≤ 1 %
2. Value at Tc = 25°C
3. Value at Tch = 25°C, Rg   50Ω

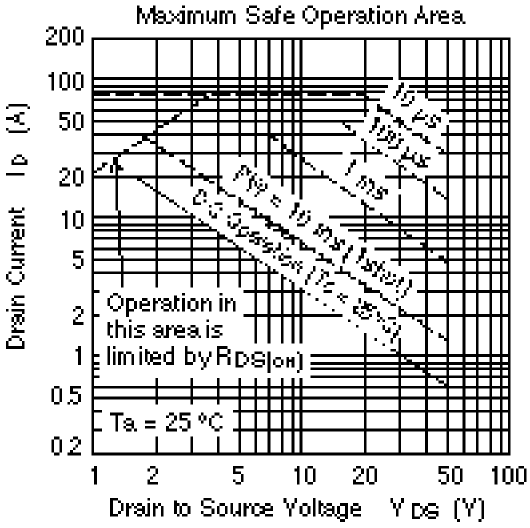
Electrical Characteristics (Ta = 25°C)

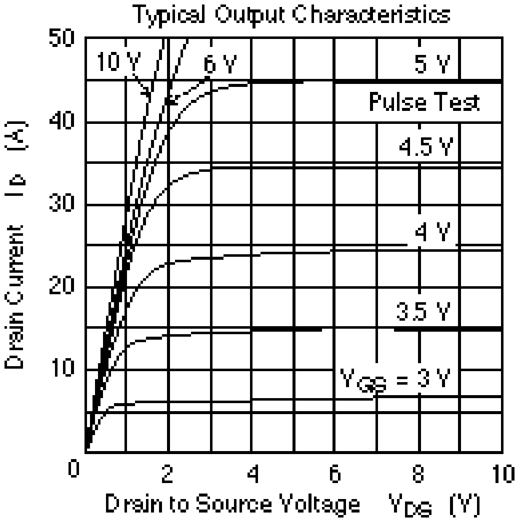
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	I_D = 10mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100μA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	μA	V_{GS} = ±16V, V_{DS} = 0
Zero gate voltege drain current	I_{DSS}	—	—	10	μA	V_{DS} = 60 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	I_D = 1mA, V_{DS} = 10V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.033	0.045	Ω	I_D = 10A, V_{GS} = 10V*[1]
	$R_{DS(on)}$	—	0.055	0.07	Ω	I_D = 10A, V_{GS} = 4V*[1]
Forward transfer admittance	$\|y_{fs}\|$	10	16	—	S	I_D = 10A, V_{DS} = 10V*[1]
Input capacitance	Ciss	—	740	—	pF	V_{DS} = 10V
Output capacitance	Coss	—	380	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	140	—	pF	f = 1MHz
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	I_D = 10A, V_{GS} = 10V
Rise time	t_r	—	110	—	ns	R_L = 3Ω
Turn-off delay time	$t_{d(off)}$	—	105	—	ns	
Fall time	t_f	—	120	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.0	—	V	I_F = 20A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	40	—	V	I_F = 20A, V_{GS} = 0 diF/ dt = 50A/μs

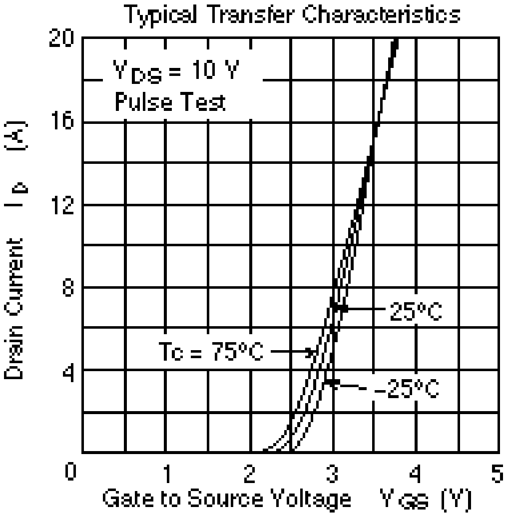
Note: 1. Pulse test

Main Characteristics

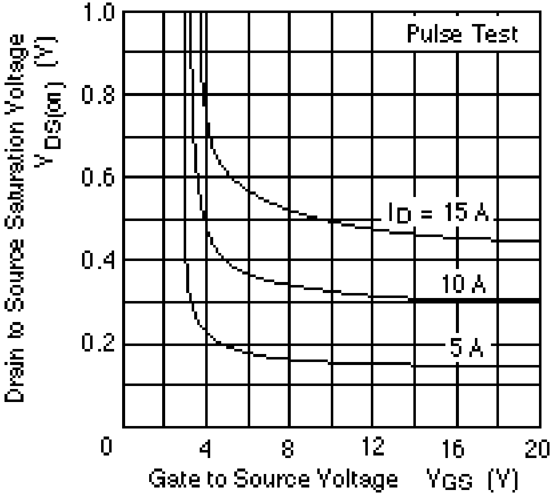




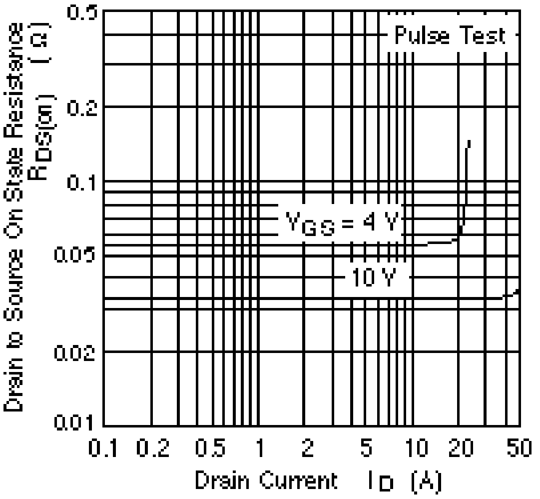




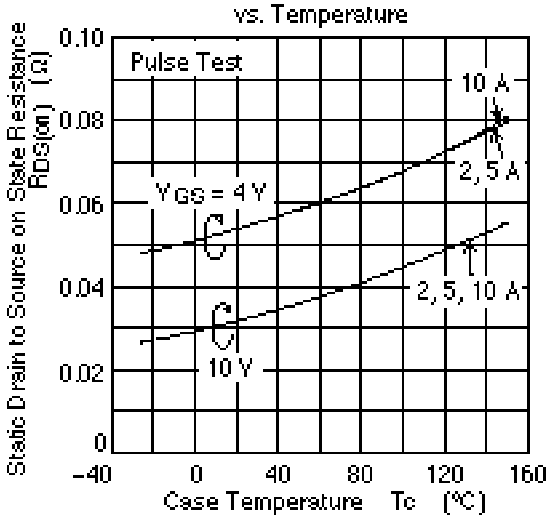
Drain to Source Saturation Voltage vs. Gate to Source Voltage



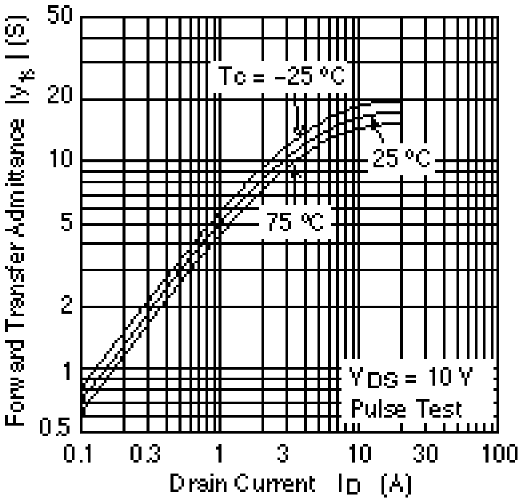
Static Drain to Source on State Resistance vs. Drain Current

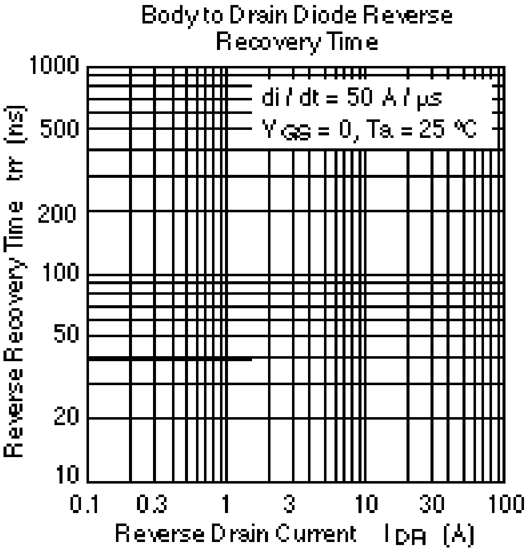


Static Drain to Source on State Resistance vs. Temperature

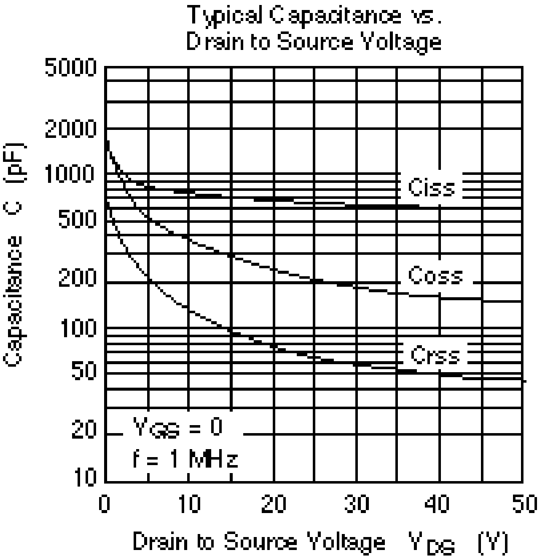


Forward Transfer Admittance vs. Drain Current

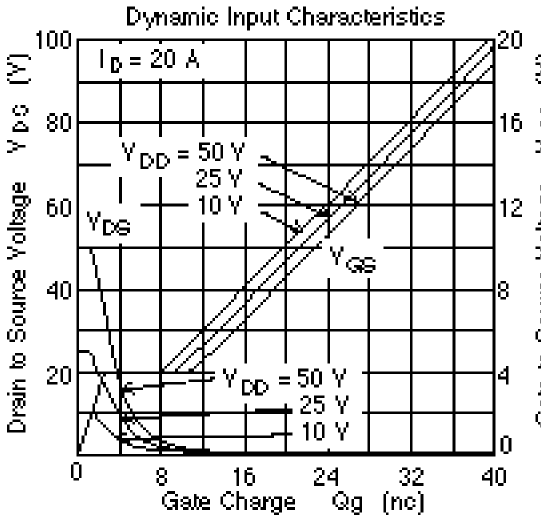




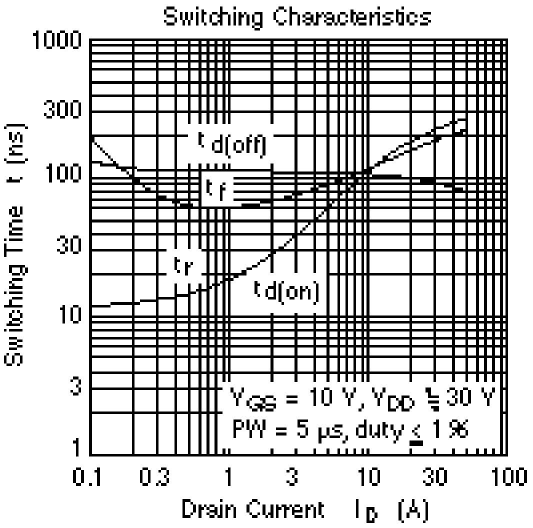
Body to Drain Diode Reverse Recovery Time



Typical Capacitance vs. Drain to Source Voltage

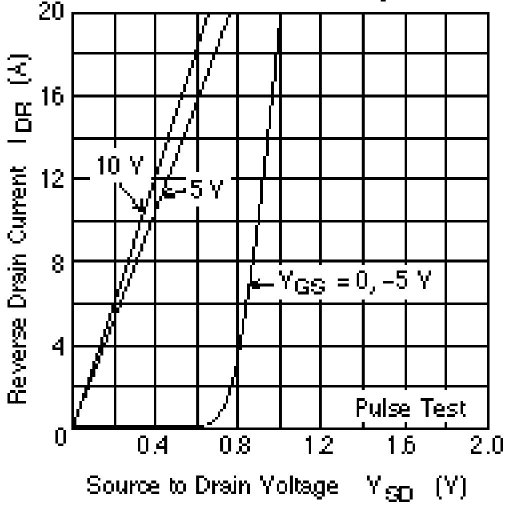


Dynamic Input Characteristics

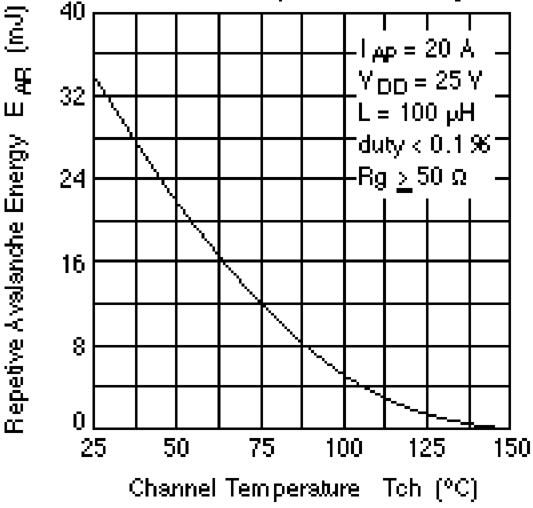


Switching Characteristics

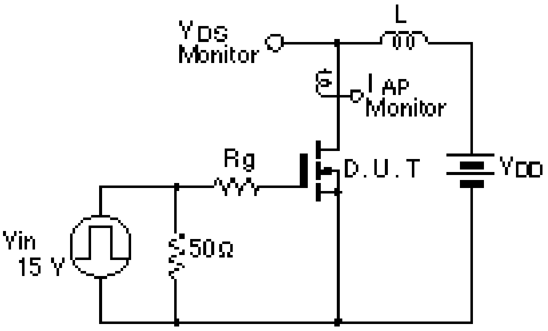
Reverse Drain Current vs.
Source to Drain Voltage



Maximun Avalanche Energy vs.
Channel Temperature Derating

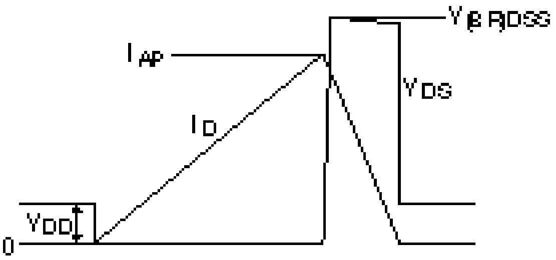


Avalanche Test Circuit

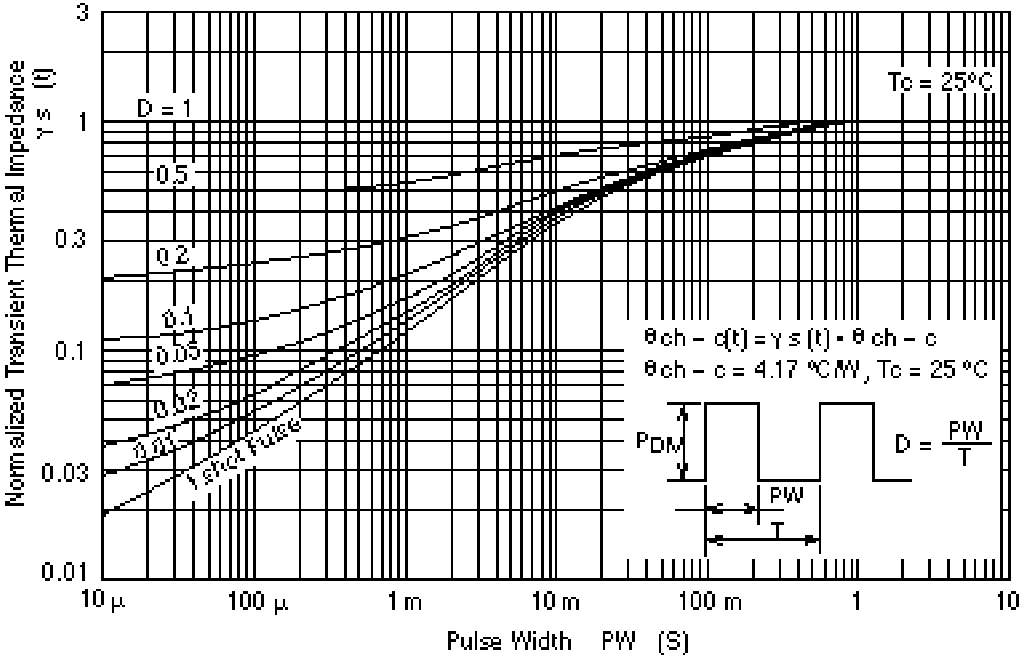


Avalanche Waveform

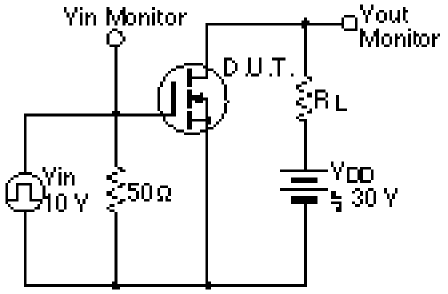
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



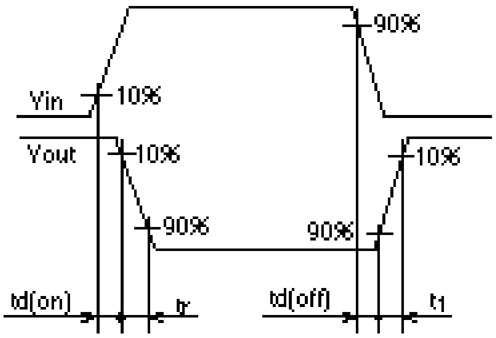
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

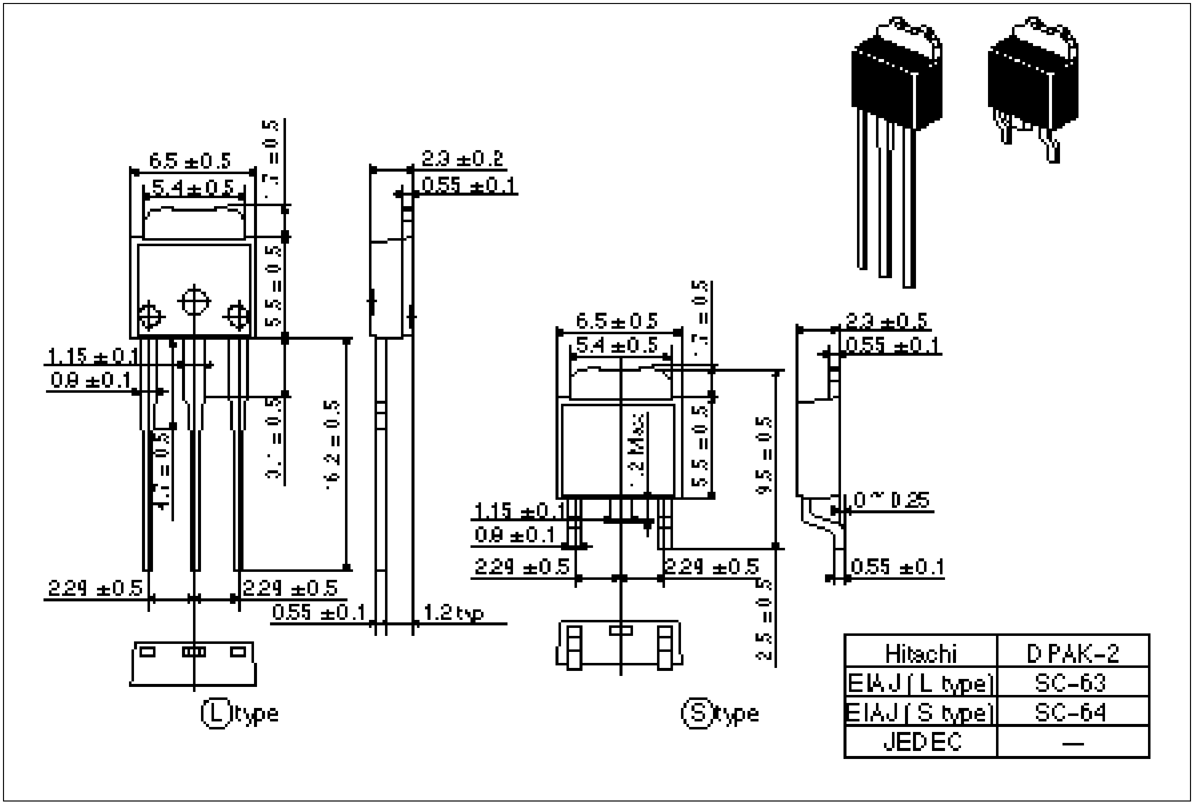


Waveform



Package Dimensions

Unit: mm



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EIAJ (L type)	SC-63
EIAJ (S type)	SC-64
JEDEC	—

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