2SK2096

Silicon N-Channel MOS FET

HITACHI

Application

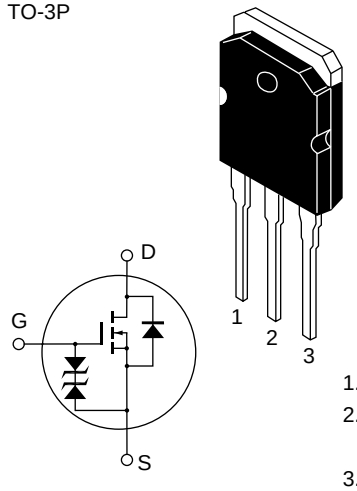
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device can be driven from 5 V source
- Suitable for switching regulator, DC-DC converter
- Avalanche ratings

Outline

TO-3P



1. Gate
2. Drain (Flange)
3. Source

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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	45	A
Drain peak current	$I_{D(pulse)}$*[1]	180	A
Body to drain diode reverse drain current	I_{DR}	45	A
Avalanche current	I_{AP}*[3]	45	A
Avalanche energy	E_{AR}*[3]	173	mJ
Channel dissipation	Pch*[2]	100	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

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

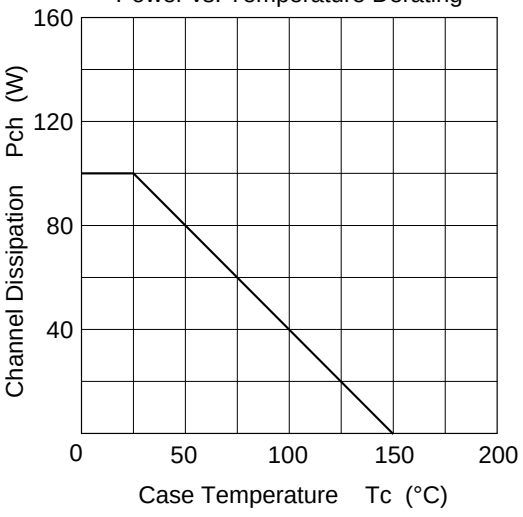
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} = 50 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.25	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.018	0.022	Ω	I_D = 25 A V_{GS} = 10 V*[1]
		—	0.023	0.028	Ω	I_D = 25 A V_{GS} = 4 V*[1]
Forward transfer admittance	$\|y_{fs}\|$	25	37	—	S	I_D = 25 A V_{DS} = 10 V*[1]
Input capacitance	Ciss	—	3530	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	1480	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	300	—	pF	f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	33	—	ns	I_D = 25 A
Rise time	t_r	—	160	—	ns	V_{GS} = 10 V
Turn-off delay time	$t_{d(off)}$	—	450	—	ns	R_L = 1.5 Ω
Fall time	t_f	—	230	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.3	—	V	I_F = 45 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	130	—	ns	I_F = 45 A, V_{GS} = 0, di_F / dt = 50 A / µs

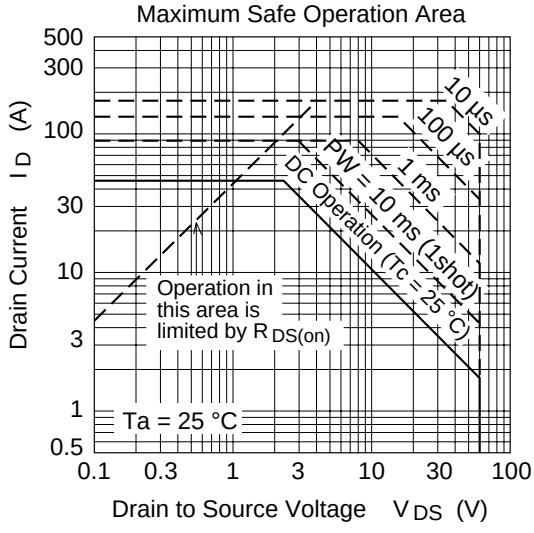
Note 1. Pulse Test

See characteristic curve of 2SK1911.

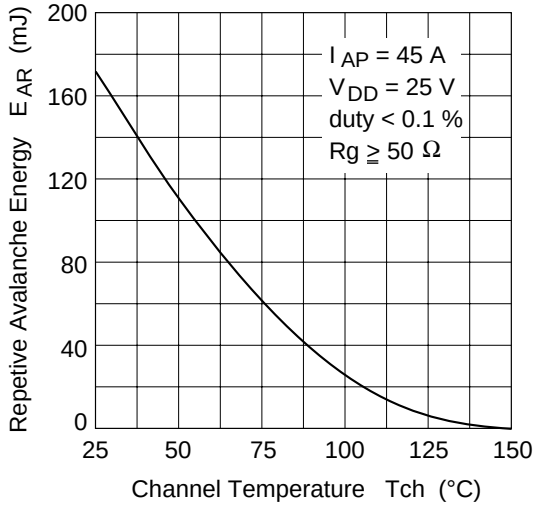
Power vs. Temperature Derating



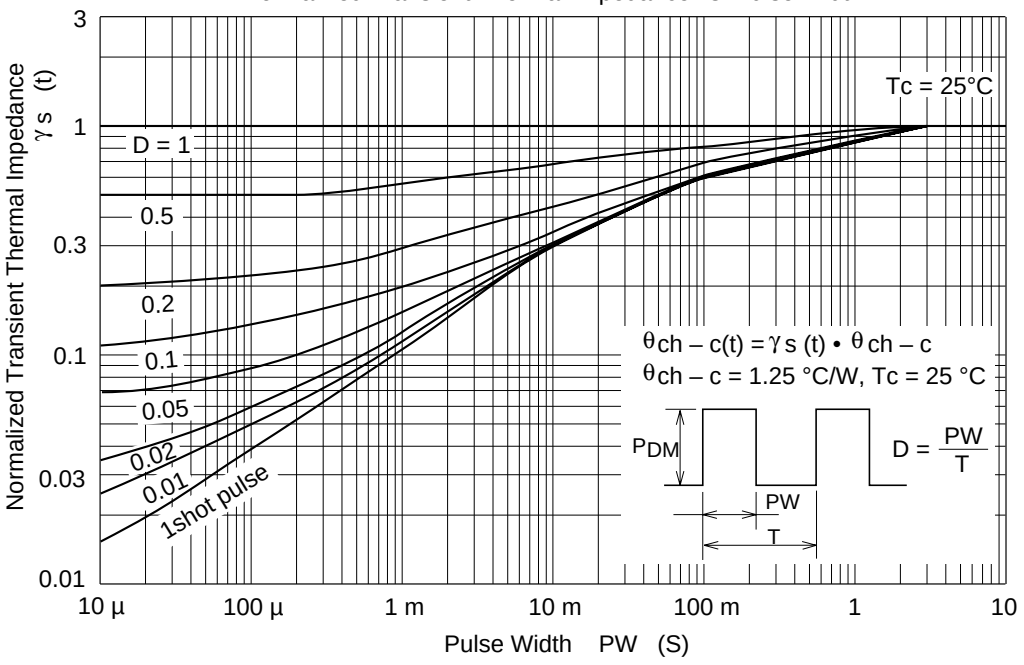
Maximum Safe Operation Area



Maximun Avalanche Energy vs.
Channel Temperature Derating

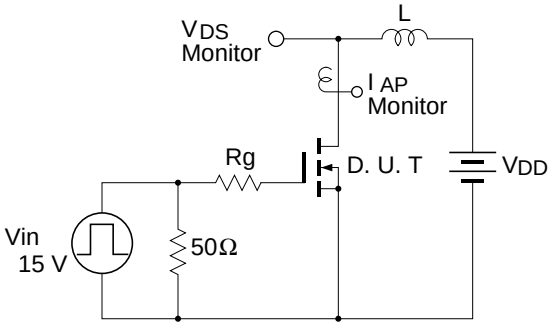


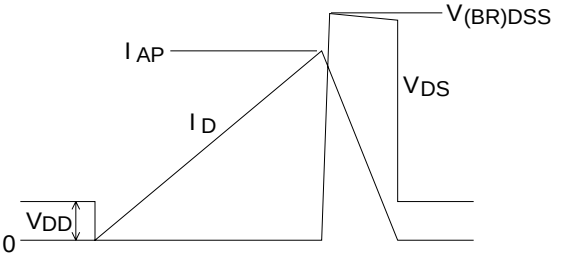
Normalized Transient Thermal Impedance vs. Pulse Width



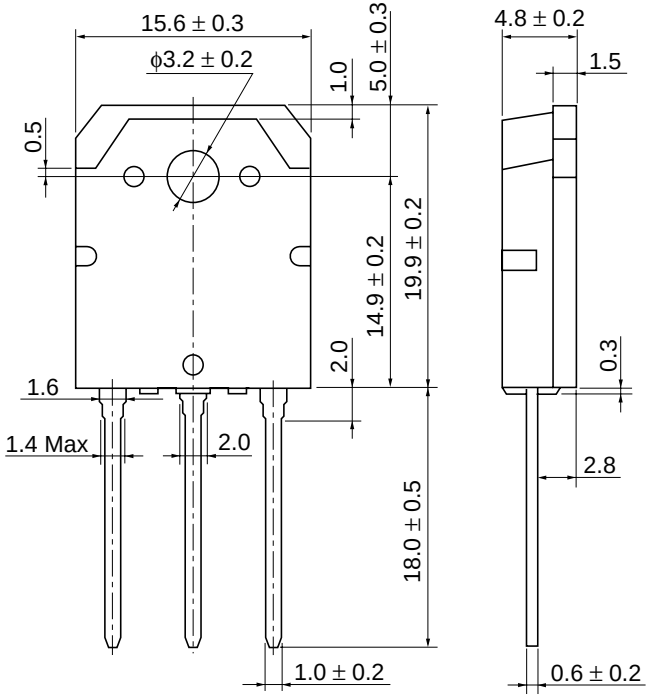
Avalanche Test Circuit and Waveform

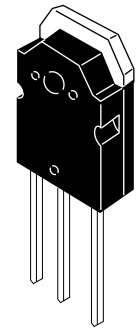
$$E_{AR} = \frac{1}{2} \bullet L \bullet I_{AP}^{2} \bullet \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

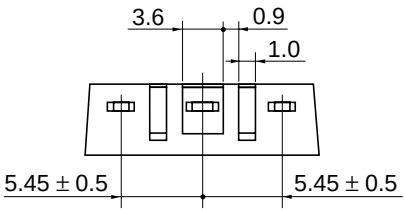




Unit: mm







Hitachi Code	TO-3P
JEDEC	—
EIAJ	Conforms
Weight (reference value)	5.0 g

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