

2SK2728

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

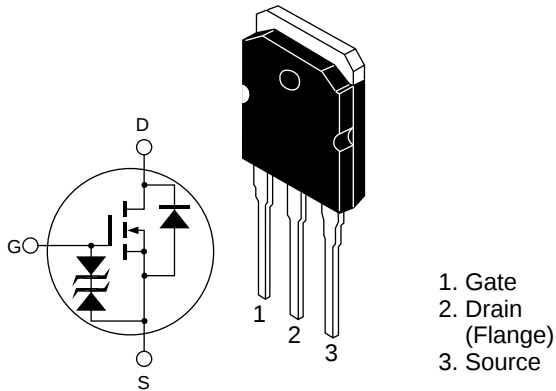
ADE-208-454 B
3rd. Edition

Features

- Low on-resistance
- High speed switching
- Low drive current
- Avalanche ratings

Outline

TO-3P



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	500	V
Gate to source voltage	V _{GSS}	±30	V
Drain current	I _D	18	A
Drain peak current	I _{D(pulse)} ^{*1}	72	A
Body to drain diode reverse drain current	I _{DR}	18	A
Avalanche current	I _{AP} ^{*3}	18	A
Avalanche energy	E _{AR} ^{*3}	18	mJ
Channel dissipation	Pch ^{*2}	150	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	−55 to +150	°C

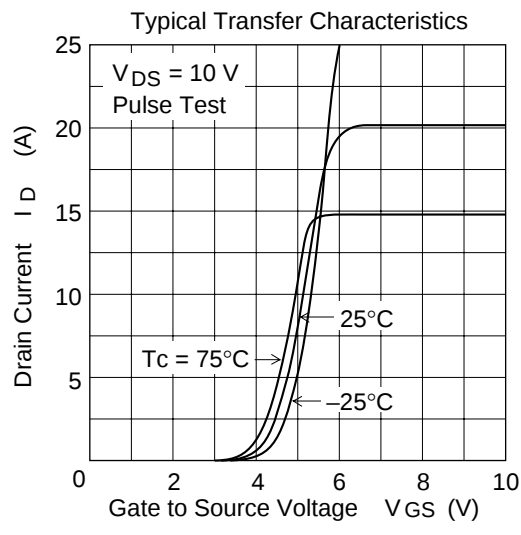
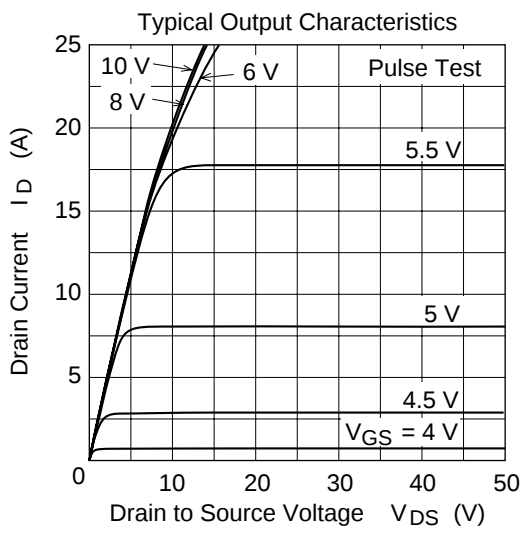
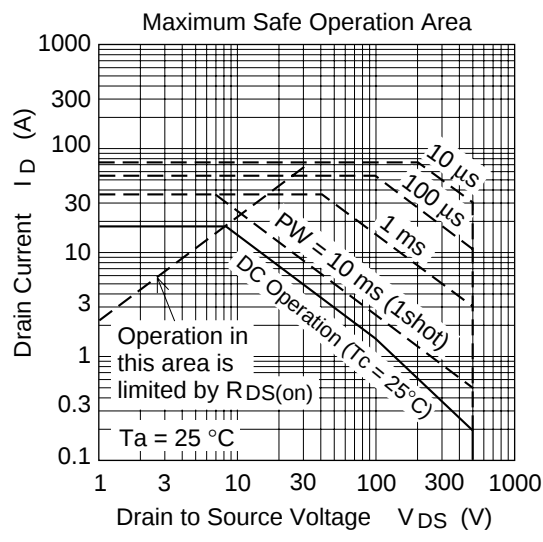
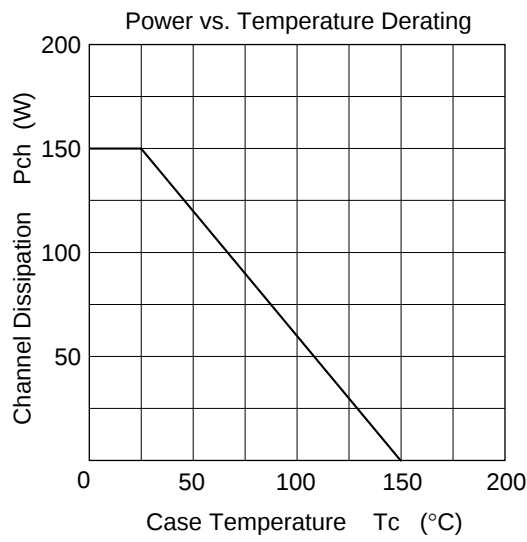
- Notes: 1. PW ≤ 10μs, duty cycle ≤ 1 %
2. Value at Tc = 25°C
3. Value at Tch = 25°C, Rg ≥ 50Ω

Electrical Characteristics (Ta = 25°C)

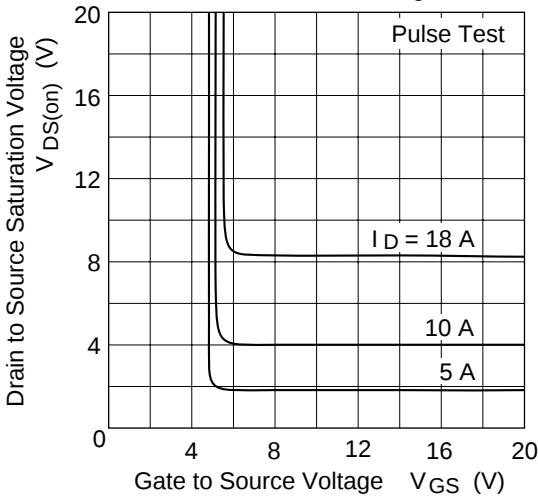
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10\text{mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 25\text{V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 500\text{V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.5	—	3.5	V	$I_D = 1\text{mA}$, $V_{DS} = 10\text{V}^{*1}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.38	0.45	Ω	$I_D = 9\text{A}$, $V_{GS} = 10\text{V}^{*1}$
Forward transfer admittance	$ y_{fs} $	8	13	—	S	$I_D = 9\text{A}$, $V_{DS} = 10\text{V}^{*1}$
Input capacitance	C_{iss}	—	2150	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	C_{oss}	—	630	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	100	—	pF	$f = 1\text{MHz}$
Total gate charge	Q_g	—	38	—	nc	$V_{DD} = 400\text{V}$
Gate to source charge	Q_{gs}	—	10	—	nc	$V_{GS} = 10\text{V}$
Gate to drain charge	Q_{gd}	—	13	—	nc	$I_D = 18\text{A}$
Turn-on delay time	$t_{d(on)}$	—	35	—	ns	$V_{GS} = 10\text{V}$, $I_D = 9\text{A}$
Rise time	t_r	—	120	—	ns	$R_L = 3.3\Omega$
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	
Fall time	t_f	—	65	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.0	—	V	$I_D = 18\text{A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	380	—	ns	$I_F = 18\text{A}$, $V_{GS} = 0$ $di_F/dt = 100\text{A}/\mu\text{s}$

Note: 1. Pulse test

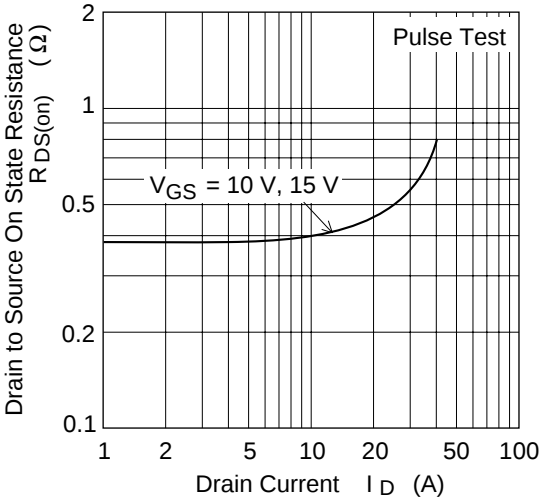
Main Characteristics



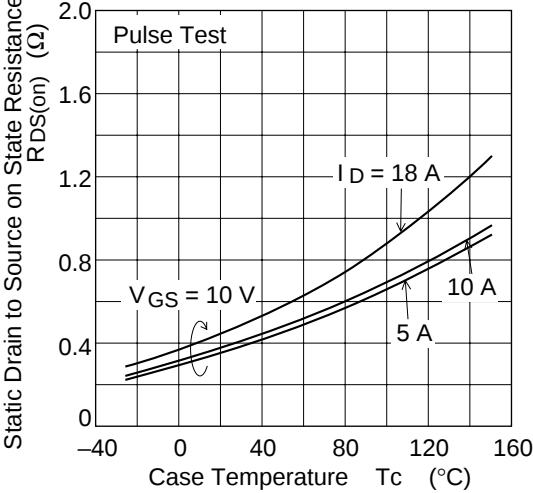
Drain to Source Saturation Voltage vs.
Gate to Source Voltage



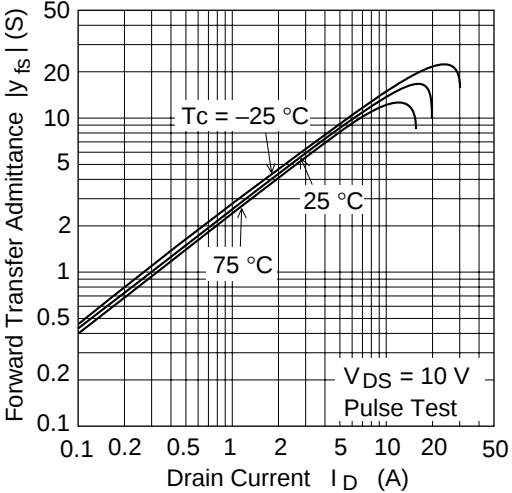
Static Drain to Source on State Resistance
vs. Drain Current



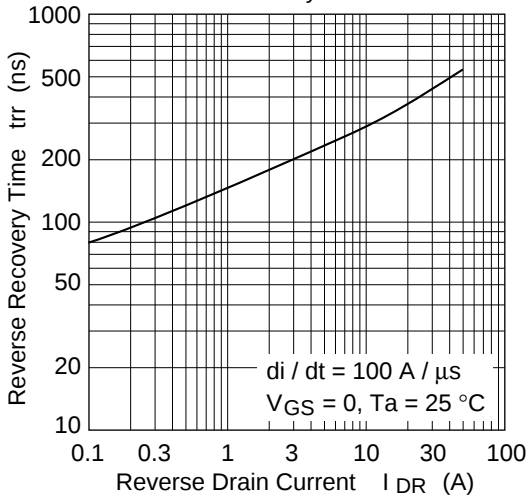
Static Drain to Source on State Resistance
vs. Temperature



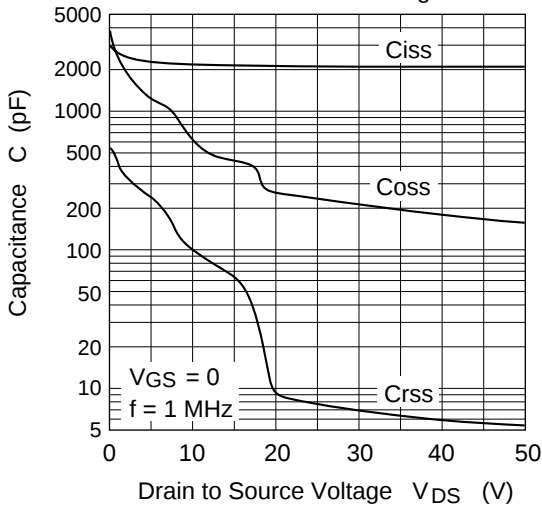
Forward Transfer Admittance vs.
Drain Current



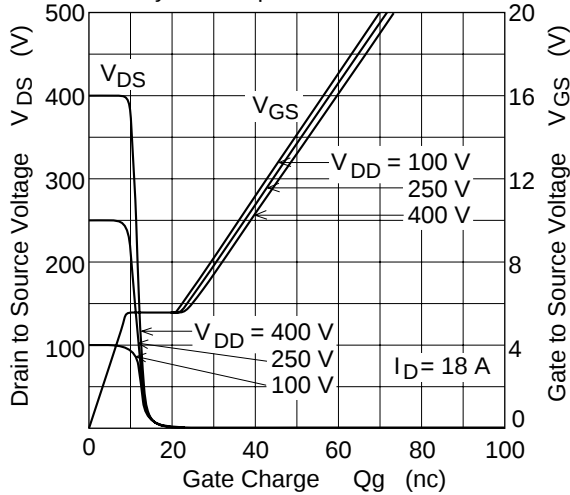
Body to Drain Diode Reverse Recovery Time



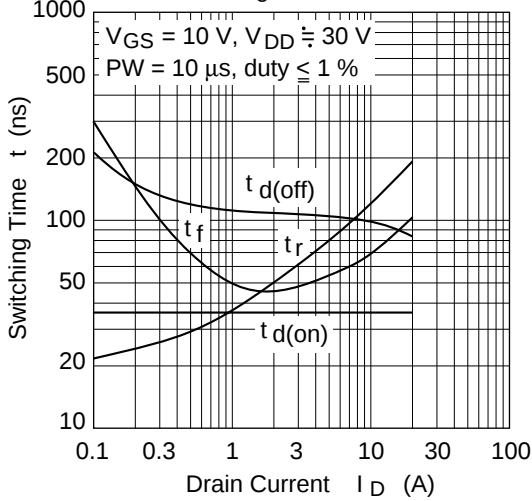
Typical Capacitance vs. Drain to Source Voltage

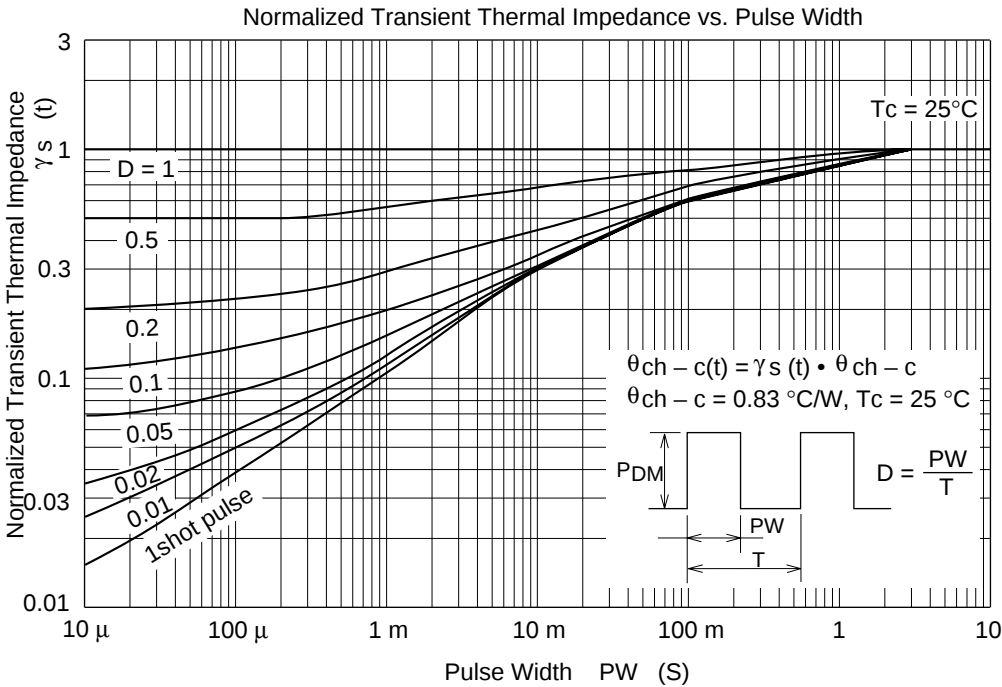
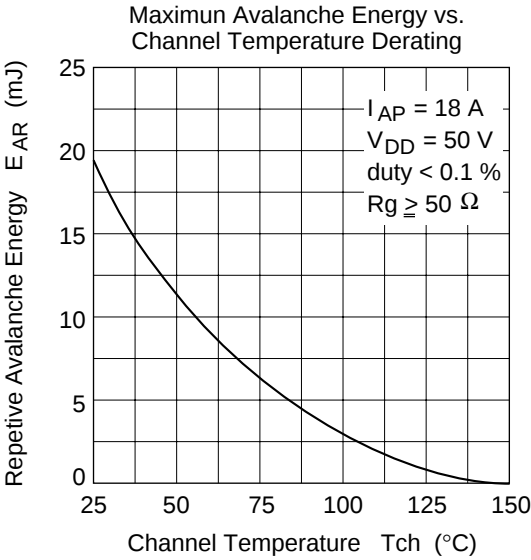
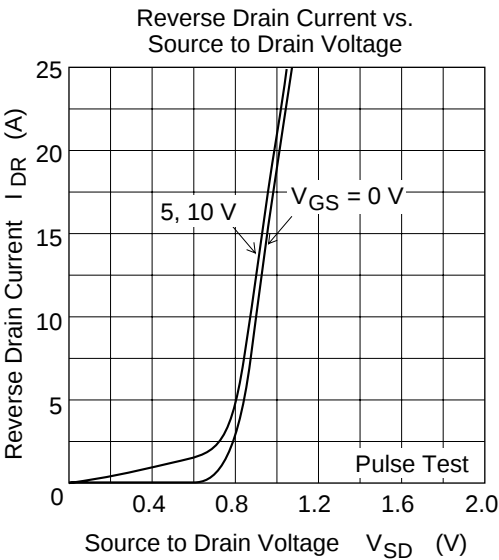


Dynamic Input Characteristics

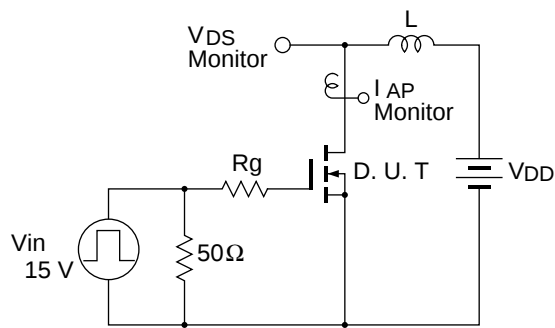


Switching Characteristics

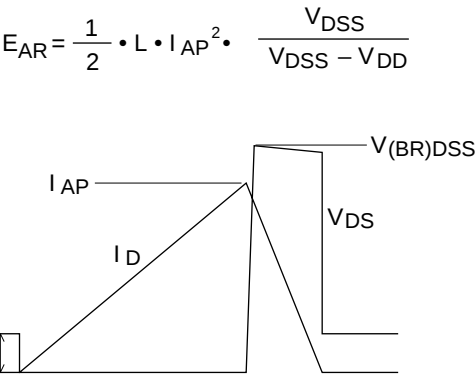




Avalanche Test Circuit

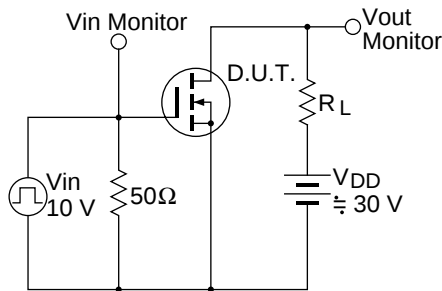


Avalanche Waveform

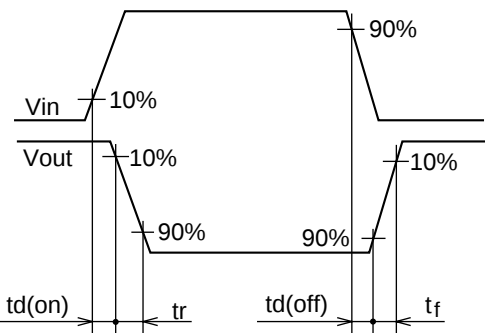


$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

Switching Time Test Circuit

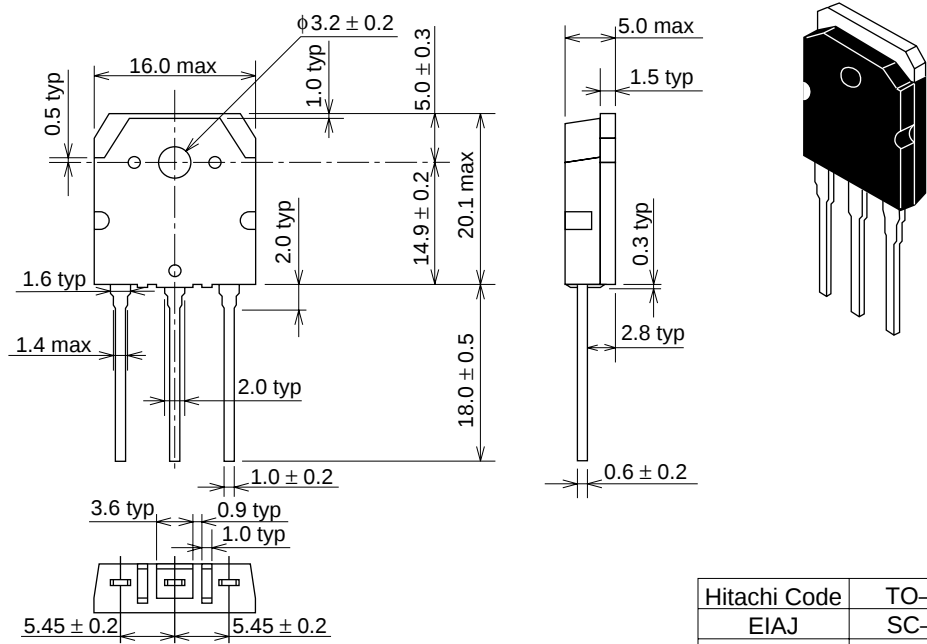


Switching Time Waveform



Package Dimensions

Unit: mm



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