

2SK2828

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

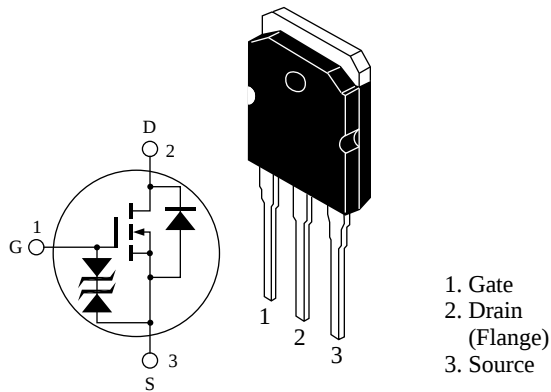
ADE-208-514 C (Z)
4th. Edition
Feb 1999

Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter
- Avalanche ratings

Outline

TO-3P



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	700	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D	12	A
Drain peak current	$I_{D(pulse)}^{*1}$	48	A
Body-drain diode reverse drain current	I_{DR}	12	A
Channel dissipation	Pch^{*2}	175	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

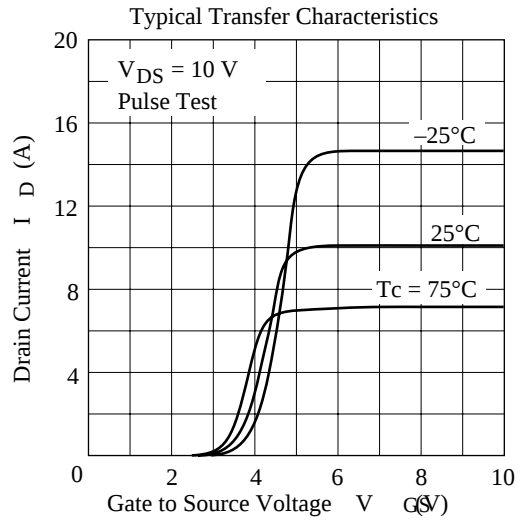
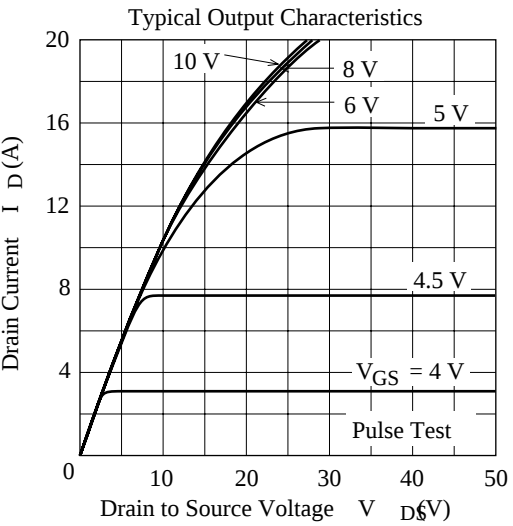
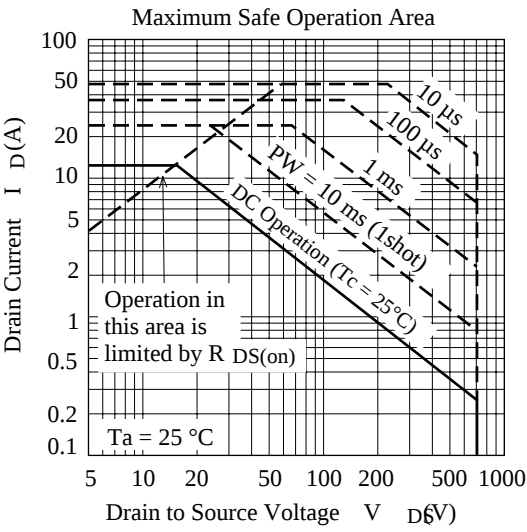
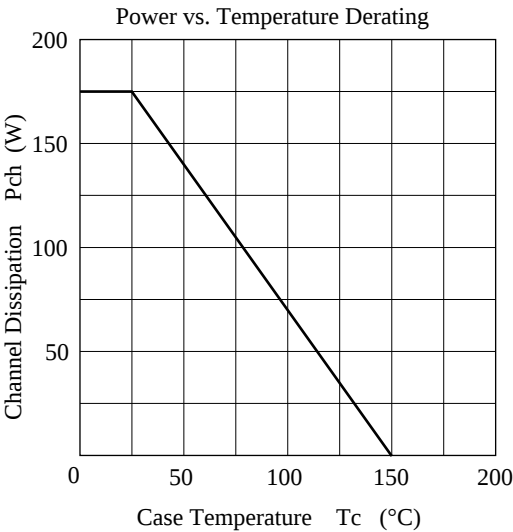
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
2. Value at Tc = 25°C

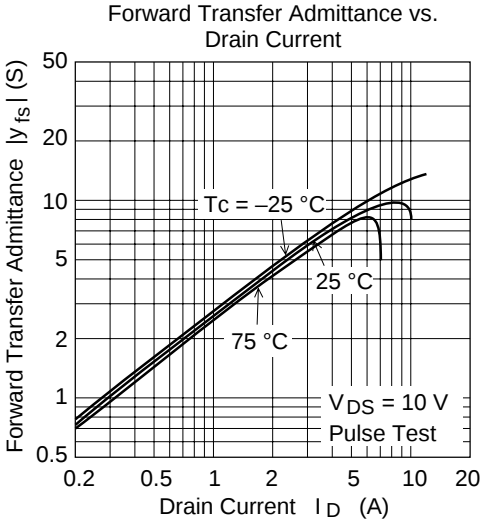
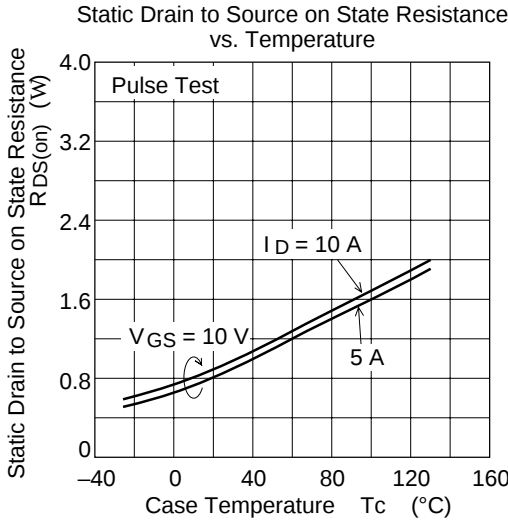
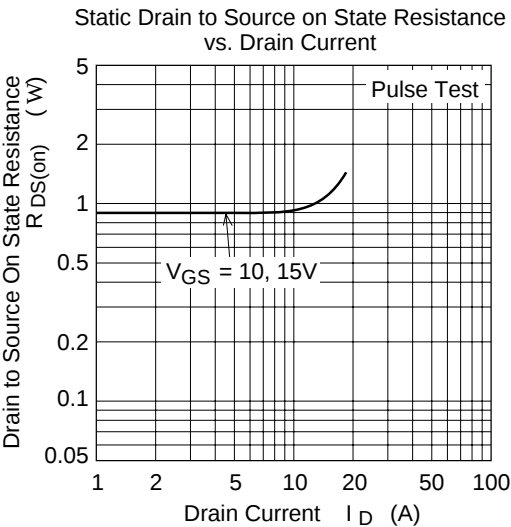
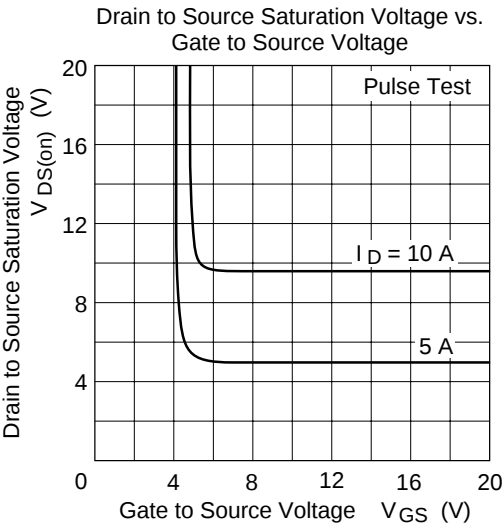
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	700	—	—	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}	—	—	100	μA	$V_{DS} = 560\text{V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1\text{mA}$, $V_{DS} = 10\text{V}^{*3}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.9	1.2	Ω	$I_D = 6\text{A}$, $V_{GS} = 10\text{V}^{*3}$
Forward transfer admittance	$ y_{fs} $	5.5	9.0	—	S	$I_D = 6\text{A}$, $V_{DS} = 10\text{V}^{*3}$
Input capacitance	C_{iss}	—	1850	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	C_{oss}	—	400	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	45	—	pF	$f = 1\text{MHz}$
Total gate charge	Q_g	—	35	—	nC	$V_{DD} = 400\text{V}$
Gate to source charge	Q_{gs}	—	8	—	nC	$V_{GS} = 10\text{V}$
Gate to drain charge	Q_{gd}	—	10	—	nC	$I_D = 12\text{A}$
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$I_D = 6\text{A}$, $R_L = 5\Omega$
Rise time	t_r	—	65	—	ns	$V_{GS} = 10\text{V}$
Turn-off delay time	$t_{d(off)}$	—	140	—	ns	
Fall time	t_f	—	55	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.95	—	V	$I_F = 12\text{A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	2.5	—	μs	$I_F = 12\text{A}$, $V_{GS} = 0$ $diF/dt = 100\text{A}/\mu\text{s}$

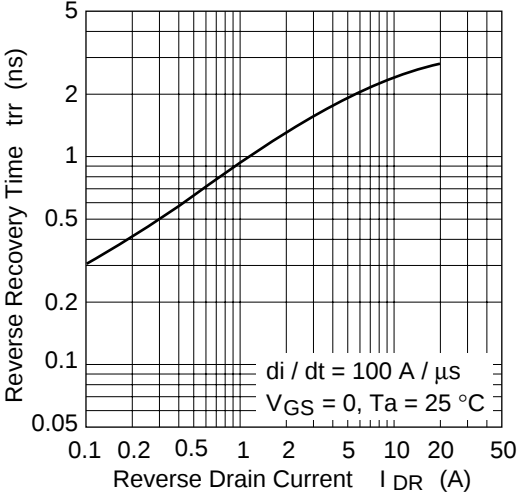
Note: 3. Pulse test

Main Characteristics

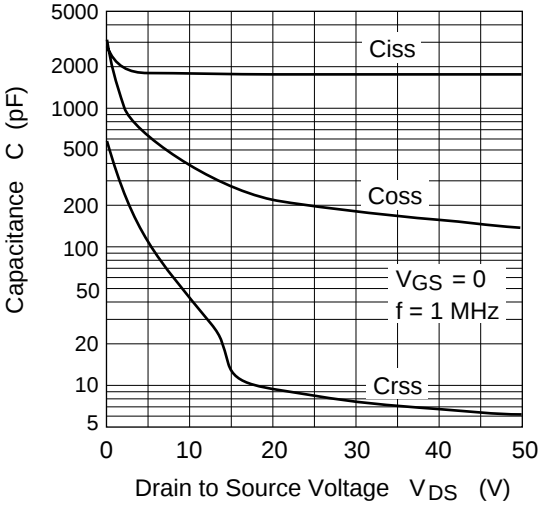




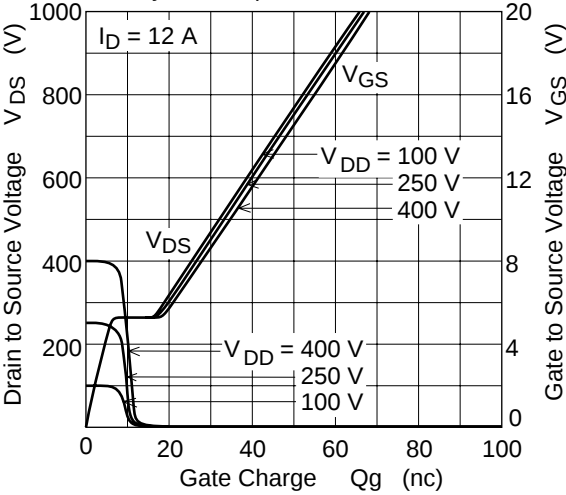
Body-Drain Diode Reverse Recovery Time



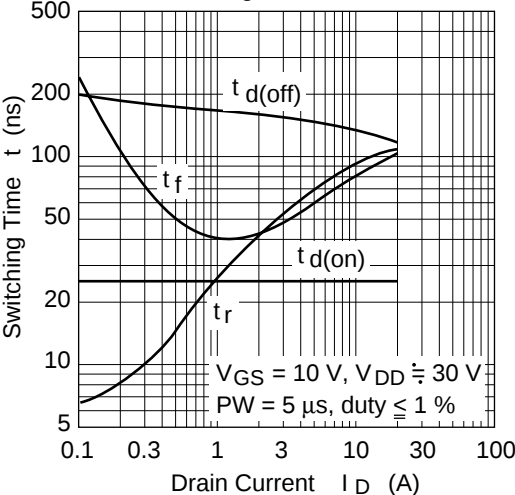
Typical Capacitance vs. Drain to Source Voltage

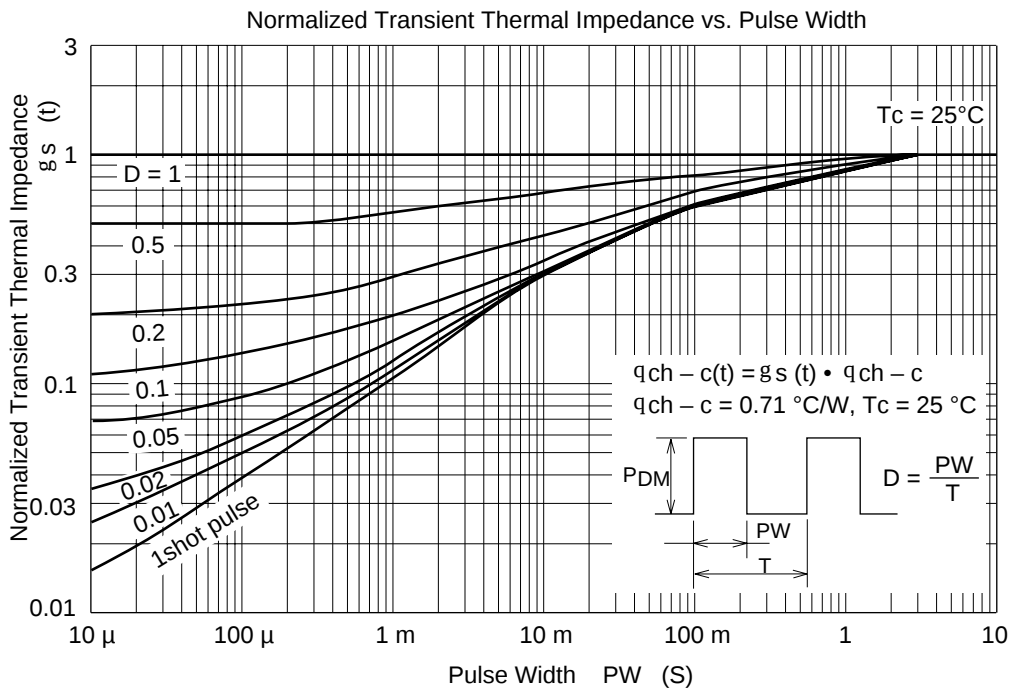
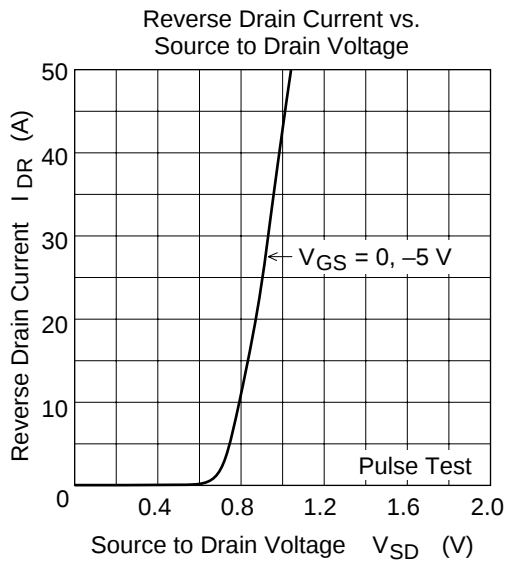


Dynamic Input Characteristics

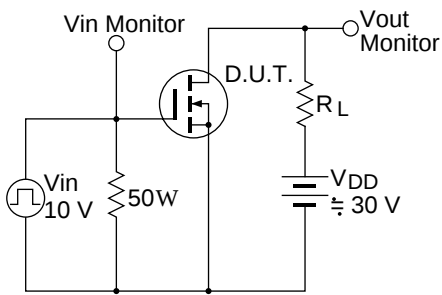


Switching Characteristics

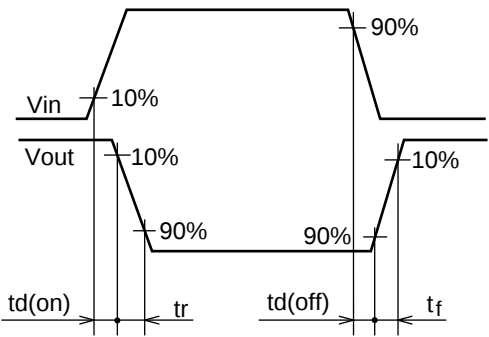




Switching Time Test Circuit



Switching Time Waveform



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