

# 2SK2828

Silicon N Channel MOS FET  
High Speed Power Switching

# HITACHI

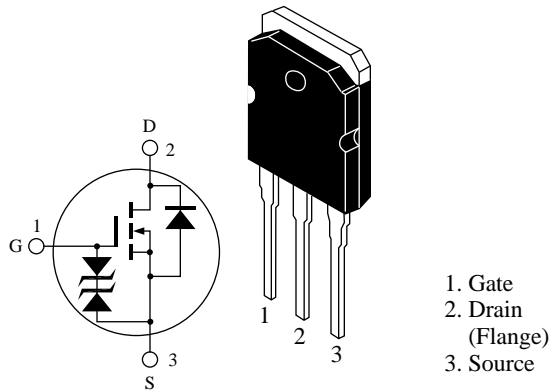
ADE-208-514 C (Z)  
4th. Edition  
Feb 1999

## 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** ( $T_a = 25^\circ\text{C}$ )

<b>Item</b>	<b>Symbol</b>	<b>Ratings</b>	<b>Unit</b>
Drain to source voltage	$V_{DSS}$	700	V
Gate to source voltage	$V_{GSS}$	$\pm 30$	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	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

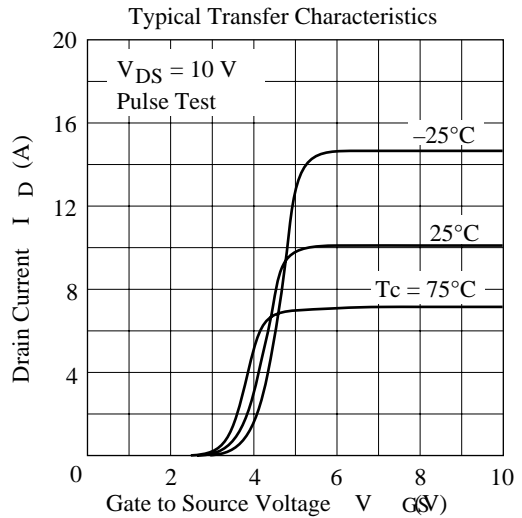
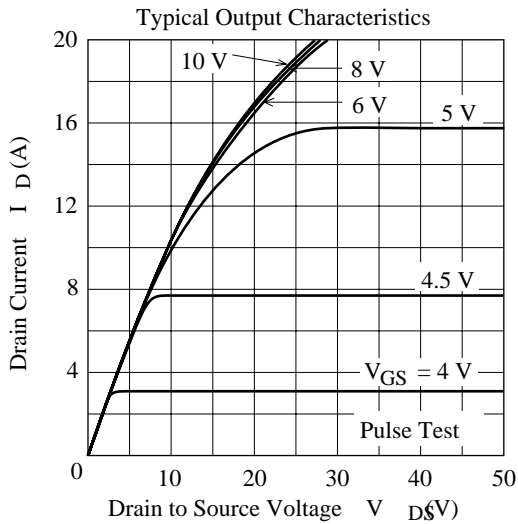
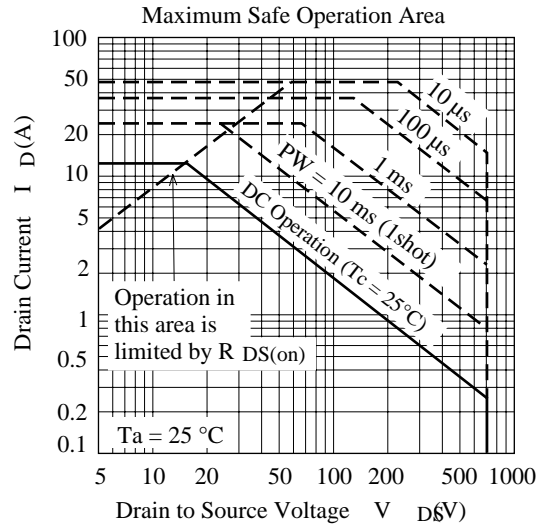
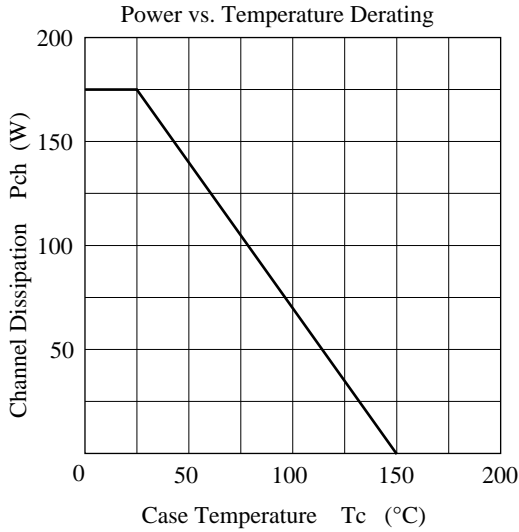
Note: 1.  $PW \leq 10\mu\text{s}$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ\text{C}$

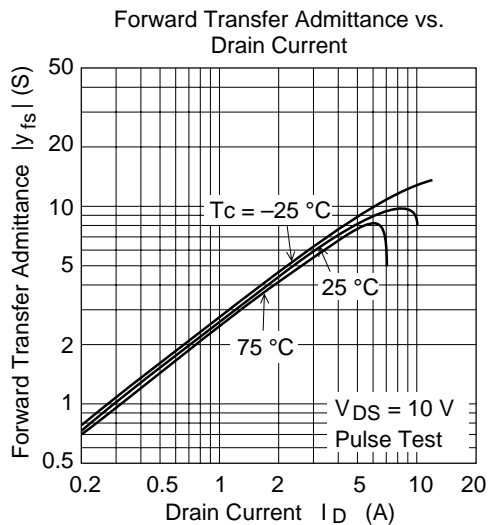
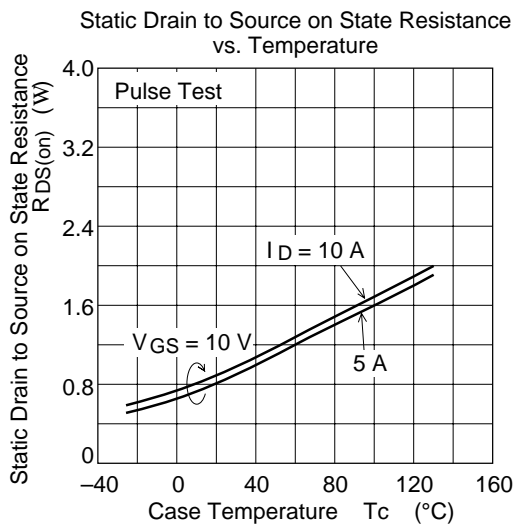
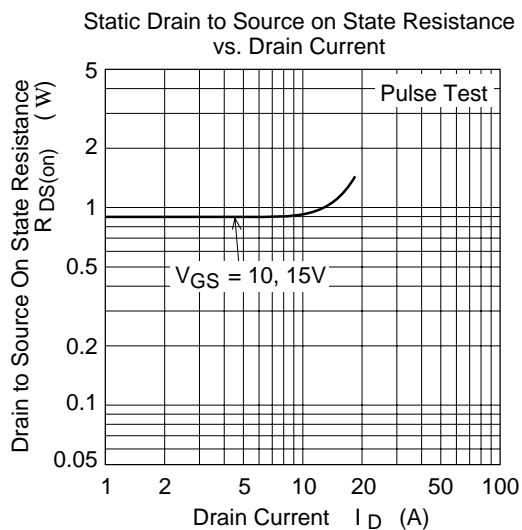
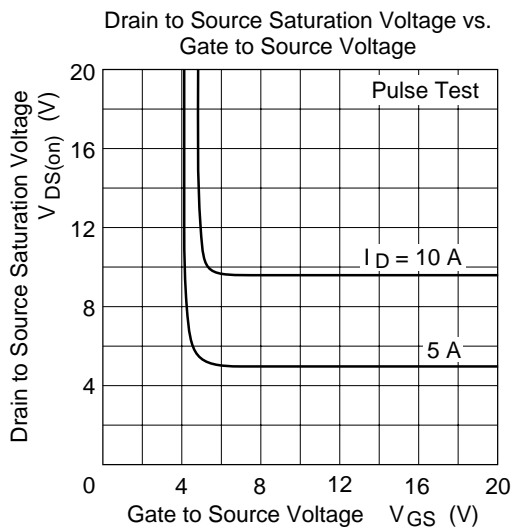
## Electrical Characteristics (Ta = 25°C)

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	$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100\mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25\text{V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	100	$\mu\text{A}$	$V_{DS} = 560\text{V}, V_{GS} = 0$
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	$\Omega$	$I_D = 6\text{A}, V_{GS} = 10\text{V}^{*3}$
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	—	$\mu\text{s}$	$I_F = 12\text{A}, V_{GS} = 0$ $diF/dt = 100\text{A}/\mu\text{s}$

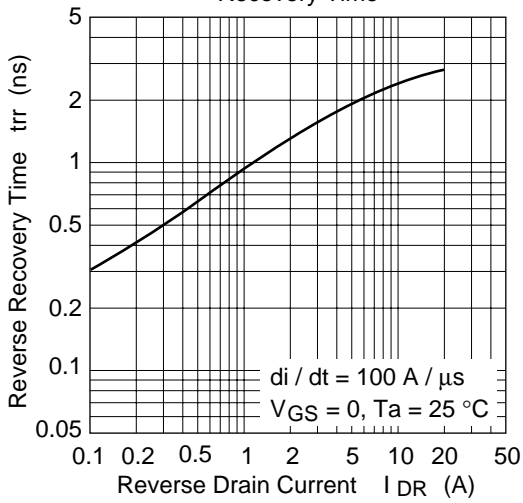
Note: 3. Pulse test

Main Characteristics

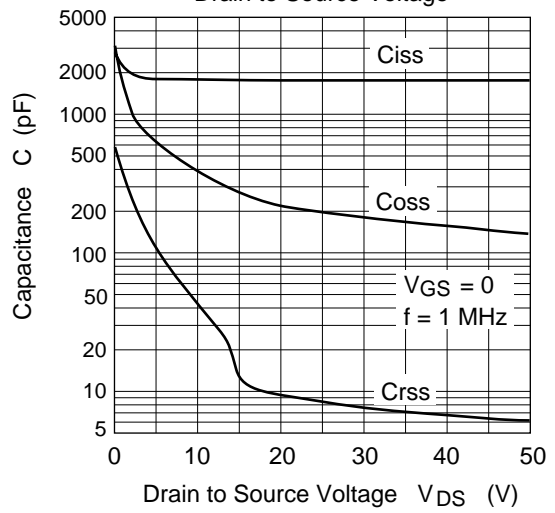




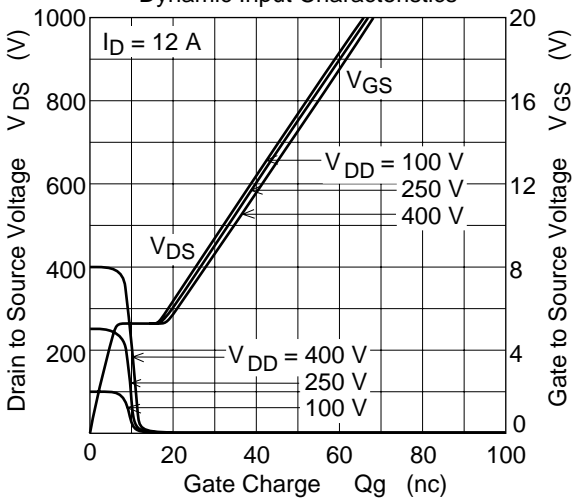
Body-Drain Diode Reverse Recovery Time



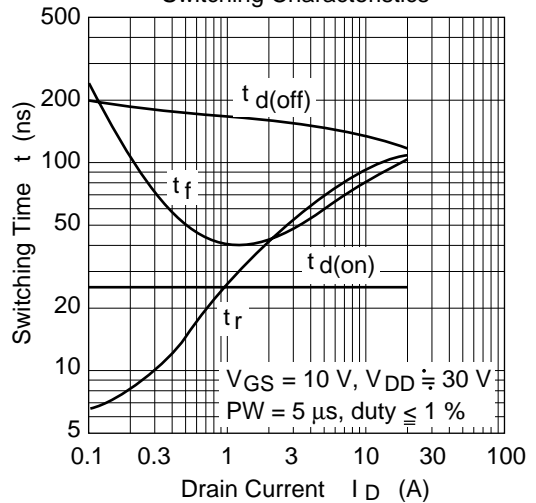
Typical Capacitance vs. Drain to Source Voltage

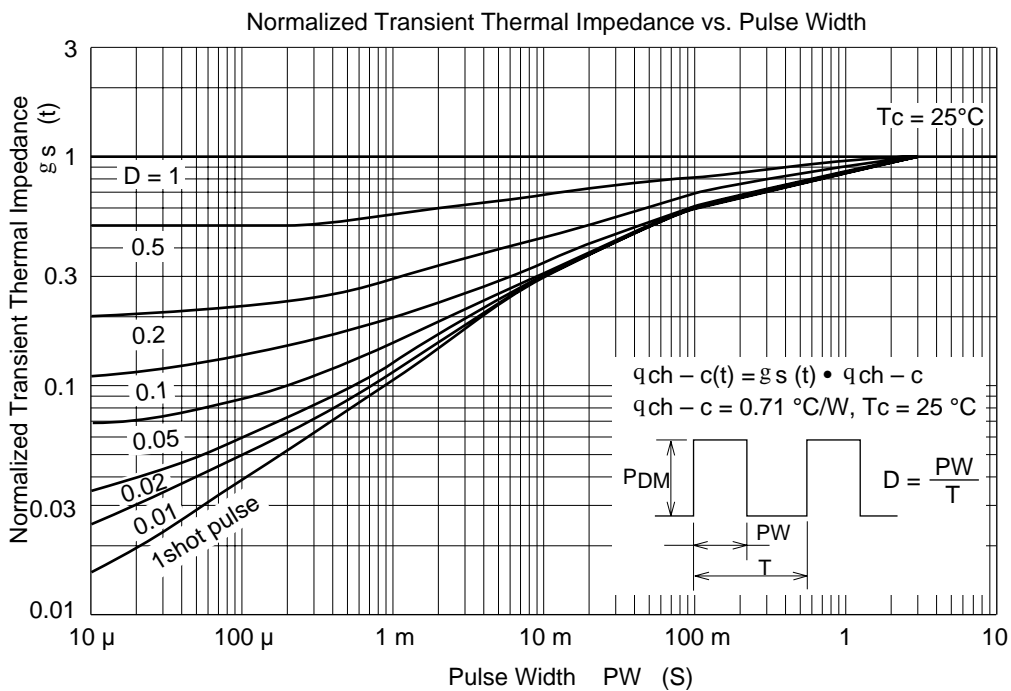
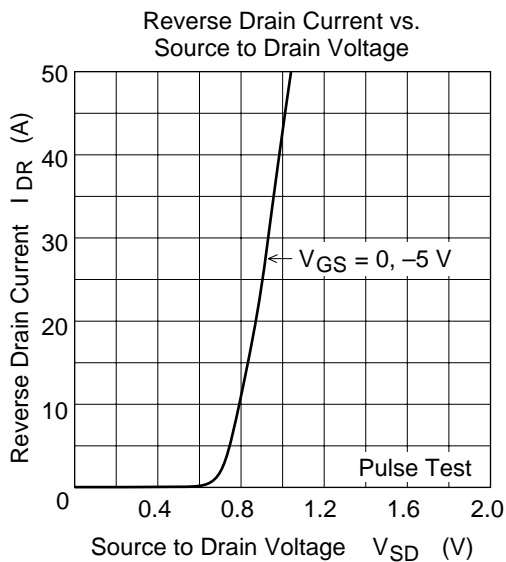


Dynamic Input Characteristics

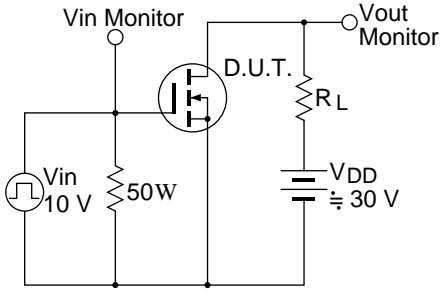


Switching Characteristics

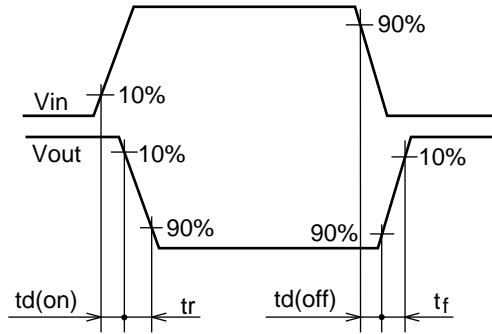




Switching Time Test Circuit



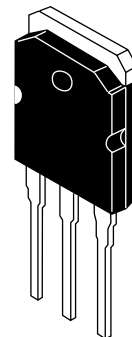
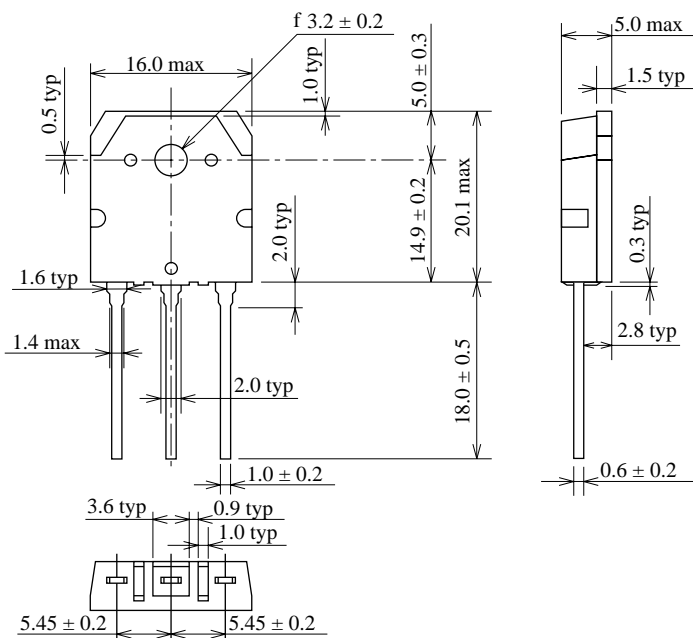
Switching Time Waveform





Package Dimentions

Unit: mm



Hitachi Code	TO-3P
EIAJ	SC-65
JEDEC	—

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