

2SK3419

Silicon N Channel MOS FET High Speed Power Switching

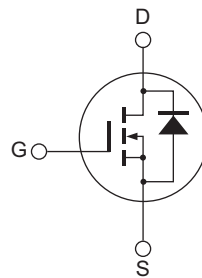
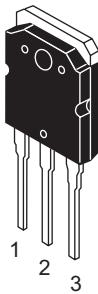
REJ03G1099-0200
(Previous: ADE-208-942)
Rev.2.00
Sep 07, 2005

Features

- Low on-resistance
 $R_{DS(on)} = 4.3 \text{ m}\Omega$ typ.
- 4 V gate drive device
- High speed switching

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)



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

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V _{DSS}	60	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	I _D	90	A
Drain peak current	I _{D (pulse)} ^{Note 1}	360	A
Body-drain diode reverse drain current	I _{DR}	90	A
Avalanche current	I _{AP} ^{Note 3}	65	A
Avalanche energy	E _{AR} ^{Note 3}	362	mJ
Channel dissipation	P _{ch} ^{Note 2}	150	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
 2. Value at T_c = 25°C
 3. Value at T_{ch} = 25°C, R_g ≥ 50 Ω

Electrical Characteristics

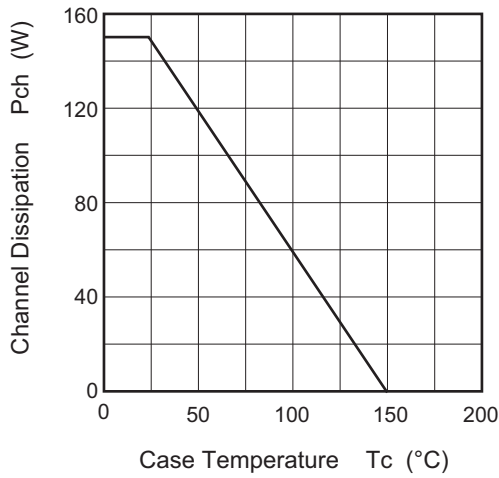
(Ta = 25°C)

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
Zero gate voltage drain current	I _{DSS}	—	—	10	μA	V _{DS} = 60 V, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±0.1	μA	V _{GS} = ±20 V, V _{DS} = 0
Gate to source cutoff voltage	V _{GS (off)}	1.0	—	2.5	V	V _{DS} = 10 V, I _D = 1 mA ^{Note 4}
Forward transfer admittance	y _{fs}	55	90	—	S	I _D = 45 A, V _{DS} = 10 V ^{Note 4}
Static drain to source on state resistance	R _{DS (on)}	—	4.3	5.5	mΩ	I _D = 45 A, V _{GS} = 10 V ^{Note 4}
	R _{DS (on)}	—	6.0	9.0	mΩ	I _D = 45 A, V _{GS} = 4 V ^{Note 4}
Input capacitance	C _{iss}	—	9770	—	pF	V _{DS} = 10 V V _{GS} = 0 f = 1 MHz
Output capacitance	C _{oss}	—	1340	—	pF	
Reverse transfer capacitance	C _{rss}	—	470	—	pF	
Total gate charge	Q _g	—	180	—	nC	V _{DD} = 50 V V _{GS} = 10 V I _D = 90 A
Gate to source charge	Q _{gs}	—	32	—	nC	
Gate to drain charge	Q _{gd}	—	36	—	nC	
Turn-on delay time	t _{d (on)}	—	53	—	ns	V _{GS} = 10 V I _D = 45 A R _L = 0.67 Ω
Rise time	t _r	—	320	—	ns	
Turn-off delay time	t _{d (off)}	—	700	—	ns	
Fall time	t _f	—	380	—	ns	
Body-drain diode forward voltage	V _{DF}	—	1.0	—	V	I _F = 90 A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	—	75	—	ns	I _F = 90 A, V _{GS} = 0 di _F /dt = 50 A/μs

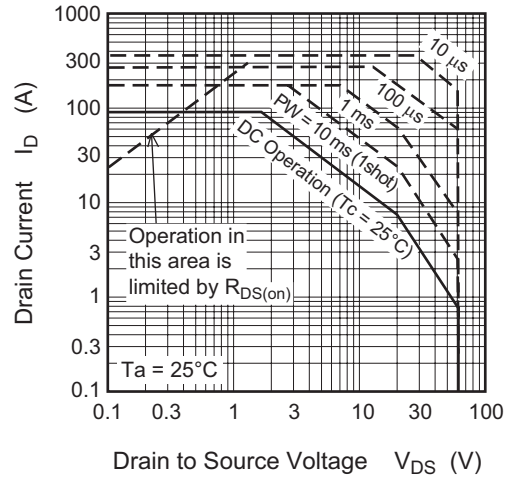
Note: 4. Pulse test

Main Characteristics

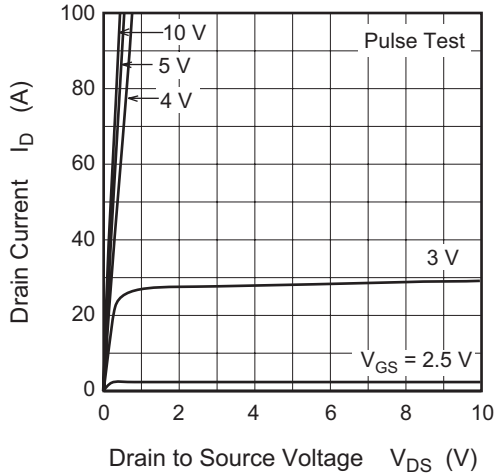
Power vs. Temperature Derating



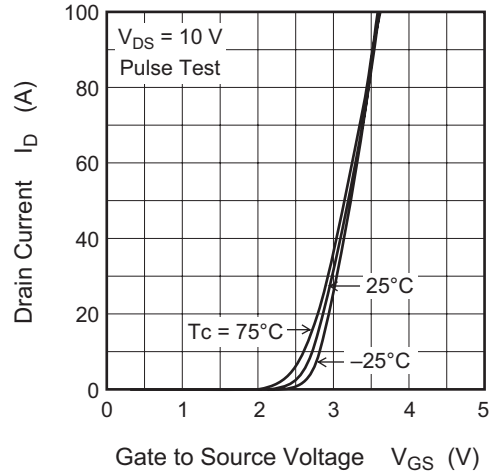
Maximum Safe Operation Area



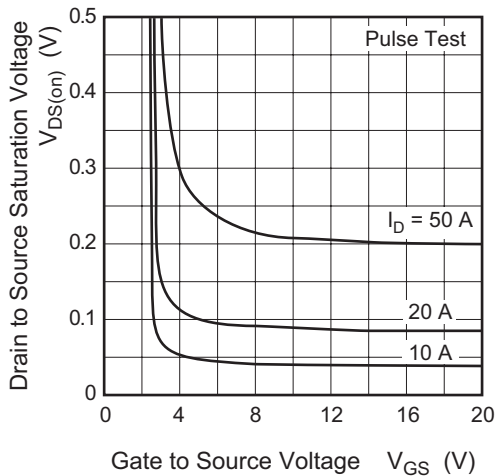
Typical Output Characteristics



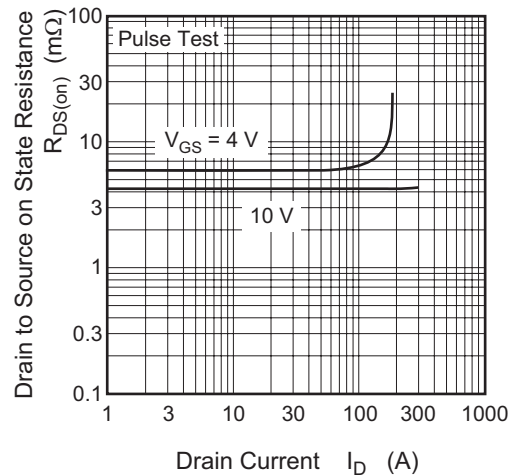
Typical Transfer Characteristics



Drain to Source Saturation Voltage vs. Gate to Source Voltage

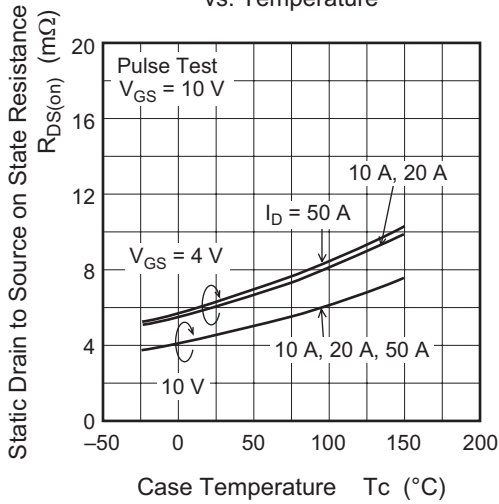


Static Drain to Source on State Resistance vs. Drain Current

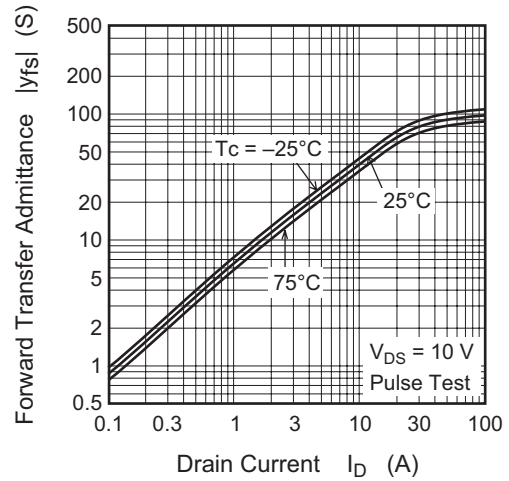


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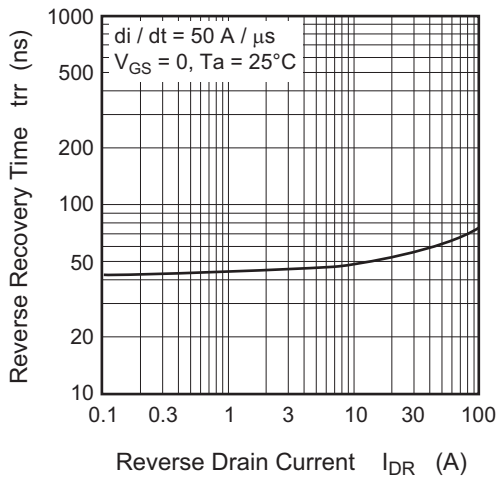
Static Drain to Source Resistance vs. Temperature



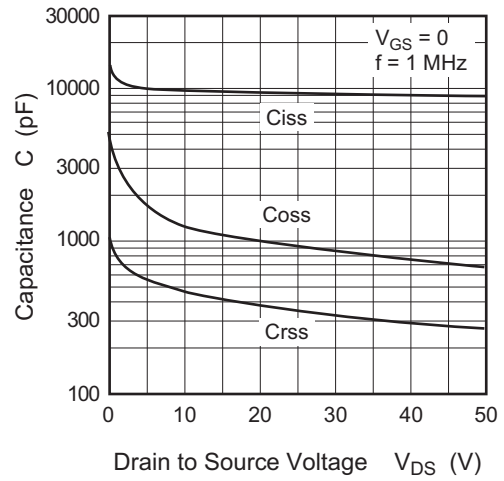
Forward Transfer Admittance vs. Drain Current



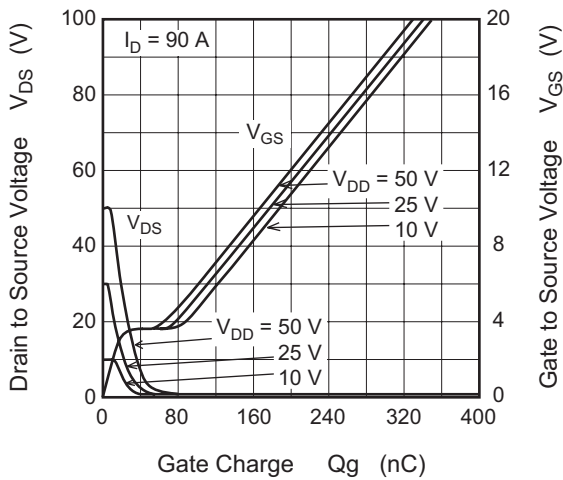
Body-Drain Diode Reverse Recovery Time



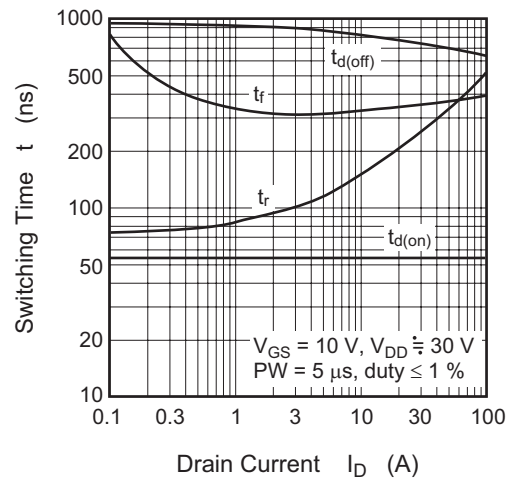
Typical Capacitance vs. Drain to Source Voltage



Dynamic Input Characteristics

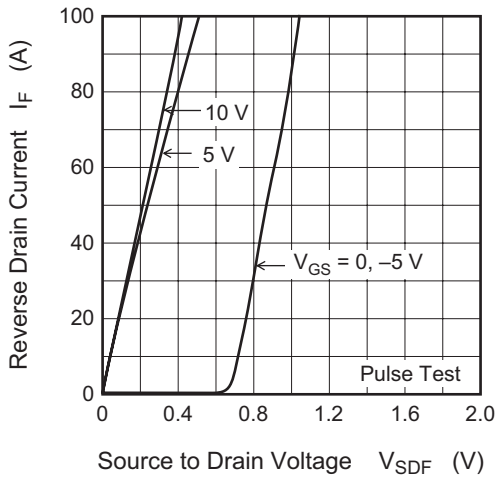


Switching Characteristics

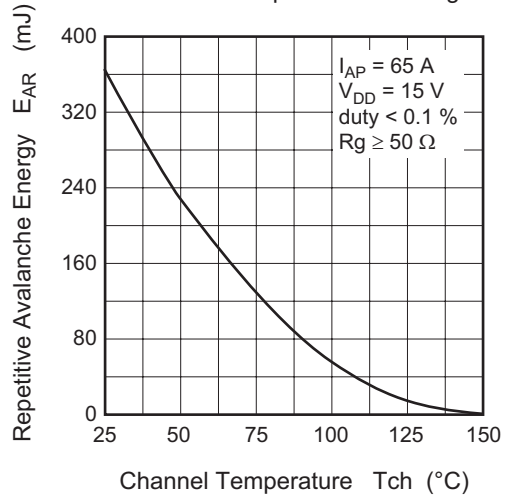


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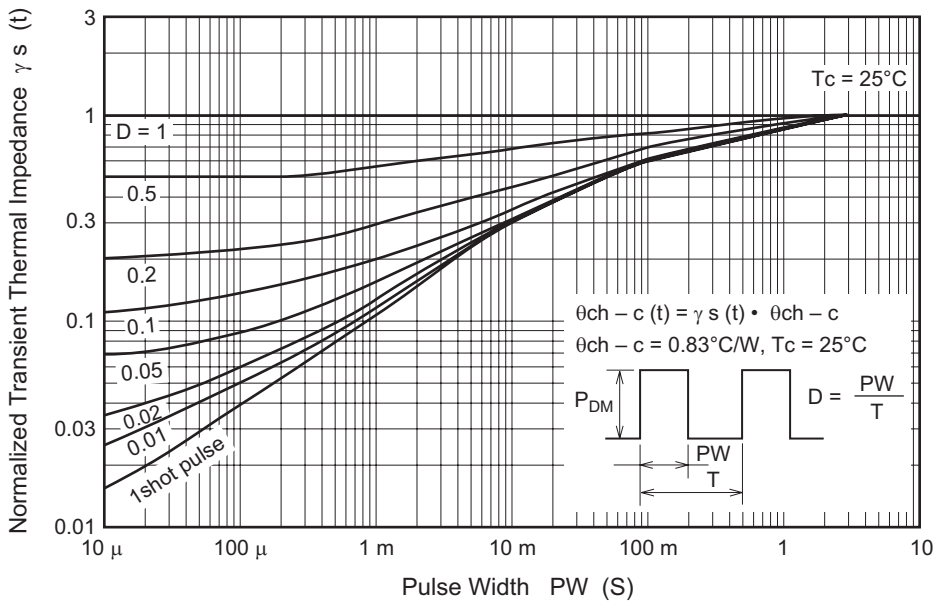
Reverse Drain Current vs. Source to Drain Voltage



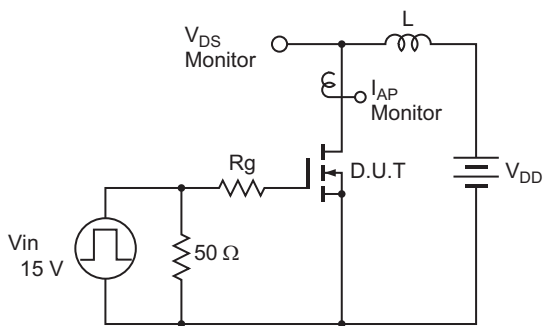
Maximum Avalanche Energy vs. Channel Temperature Derating



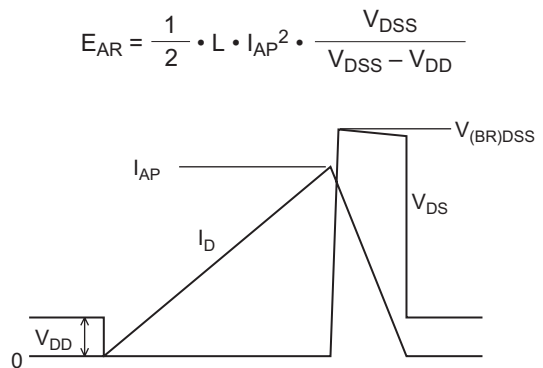
Normalized Transient Thermal Impedance vs. Pulse Width

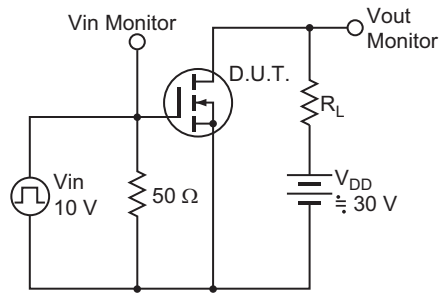


Avalanche Test Circuit

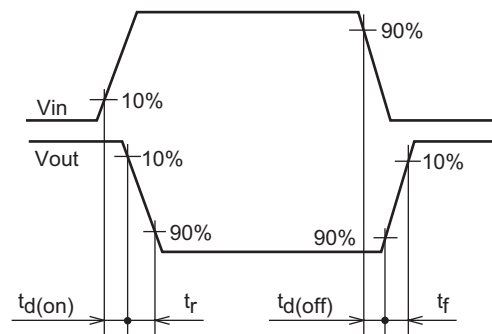


Avalanche Waveform

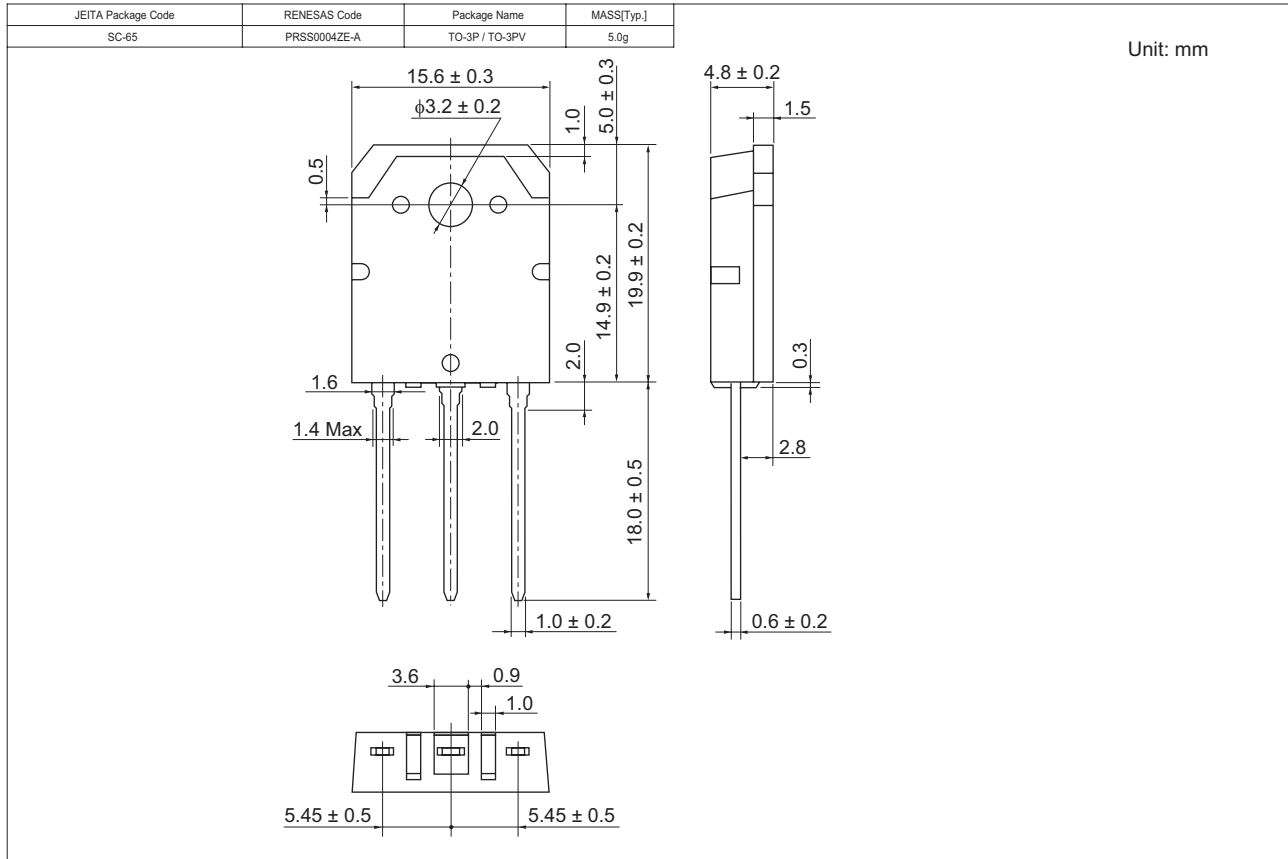


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Switching Time Waveform



Package Dimension



Ordering Information

Part Name	Quantity	Shipping Container
2SK3419-E	30 pcs	Plastic magazine

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