

2SK3159

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G1084-0400

Rev.4.00

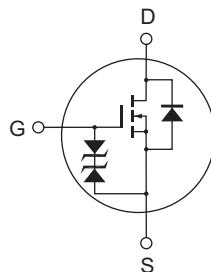
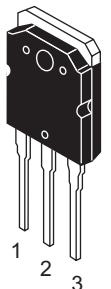
May 15, 2006

Features

- Low on-resistance
 $R_{DS} = 23 \text{ m}\Omega$ typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

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	Ratings	Unit
Drain to source voltage	V _{DSS}	150	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	I _D	50	A
Drain peak current	I _{D(pulse)} ^{Note1}	200	A
Body-drain diode reverse drain current	I _{DR}	50	A
Avalanche current	I _{AP} ^{Note3}	50	A
Avalanche energy	E _{AR} ^{Note3}	187	mJ
Channel dissipation	P _{ch} ^{Note2}	125	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Notes: 1. PW ≤ 10μs, duty cycle ≤ 1 %

2. Value at T_c = 25°C3. Value at T_{ch} = 25°C, R_g ≥ 50 Ω**Electrical Characteristics**

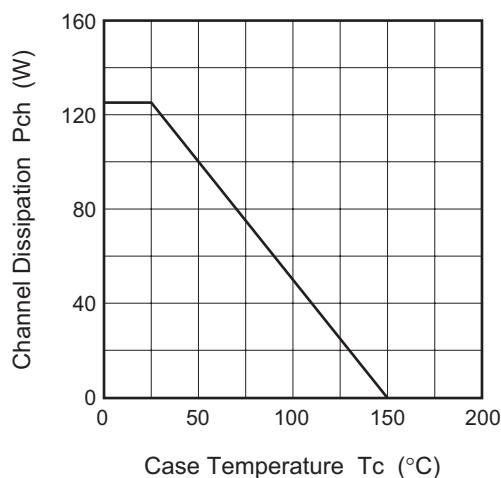
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR)DSS}	150	—	—	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}	—	—	10	μA	V _{DS} = 150 V, V _{GS} = 0
Gate to source cutoff voltage	V _{GS(off)}	1.0	—	2.5	V	I _D = 1 mA, V _{DS} = 10 V
Static drain to source on state resistance	R _{DS(on)}	—	23	30	mΩ	I _D = 25 A, V _{GS} = 10 V ^{Note4}
	R _{DS(on)}	—	28	42	mΩ	I _D = 25 A, V _{GS} = 4 V ^{Note4}
Forward transfer admittance	y _{fs}	27	45	—	S	I _D = 25 A, V _{DS} = 10 V ^{Note4}
Input capacitance	C _{iss}	—	4000	—	pF	V _{DS} = 10 V, V _{GS} = 0, f = 1 MHz
Output capacitance	C _{oss}	—	1650	—	pF	
Reverse transfer capacitance	C _{rss}	—	590	—	pF	
Turn-on delay time	t _{d(on)}	—	30	—	ns	I _D = 25 A, V _{GS} = 10 V, R _L = 1.2 Ω
Rise time	t _r	—	280	—	ns	
Turn-off delay time	t _{d(off)}	—	830	—	ns	
Fall time	t _f	—	450	—	ns	
Body-drain diode forward voltage	V _{DF}	—	0.95	—	V	I _F = 50 A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	—	200	—	ns	I _F = 50 A, V _{GS} = 0 di _F / dt = 50 A/μs

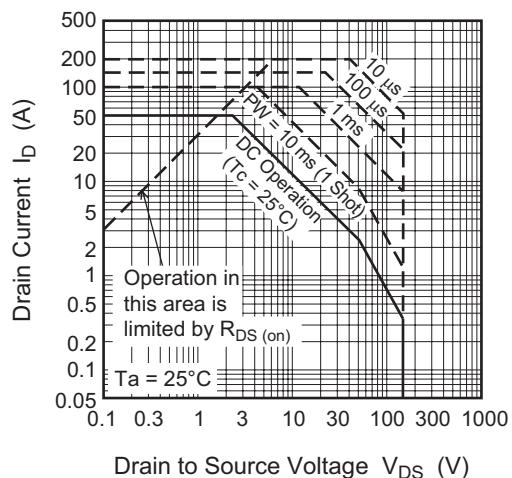
Note: 4. Pulse test

Main Characteristics

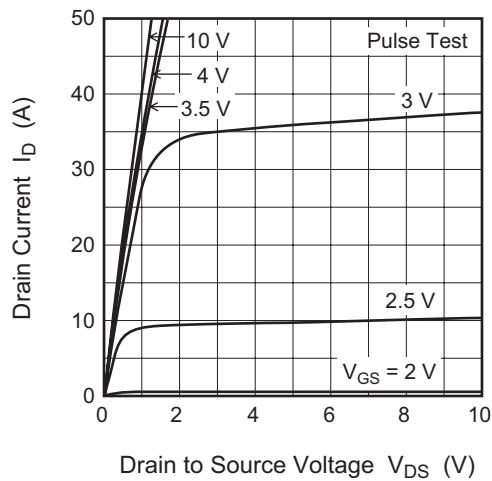
Power vs. Temperature Derating



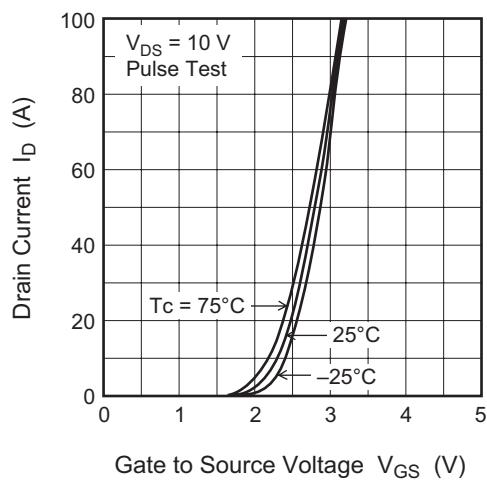
Maximum Safe Operation Area



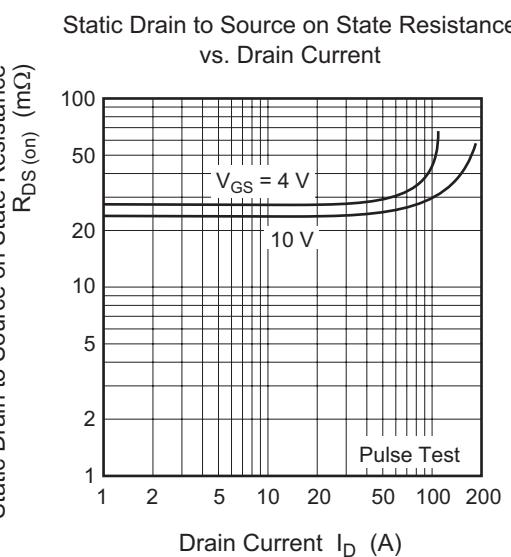
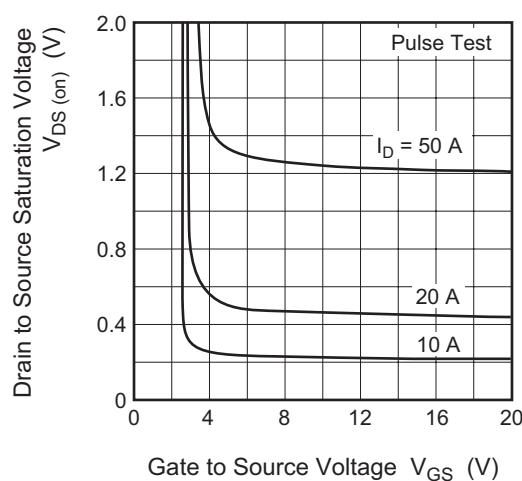
Typical Output Characteristics

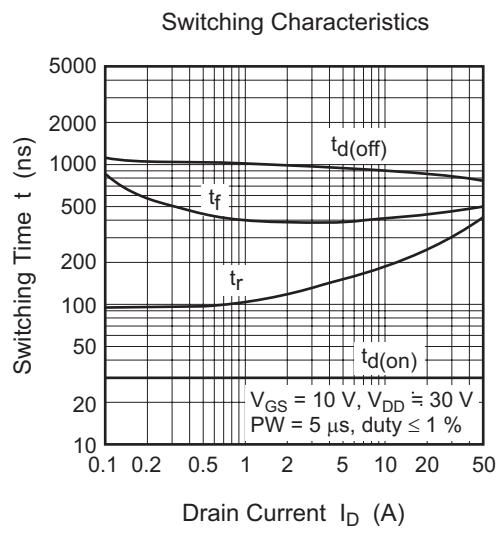
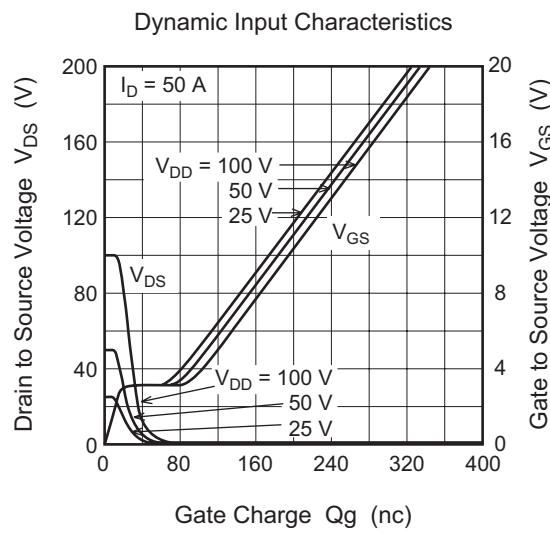
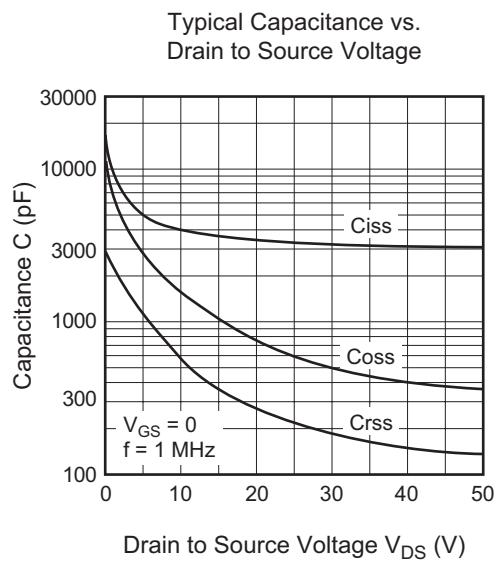
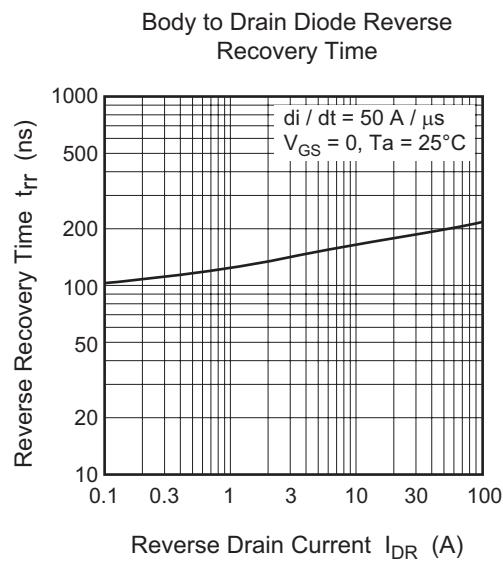
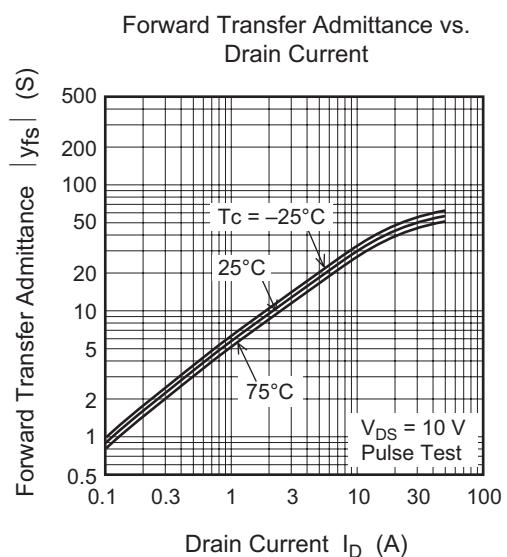
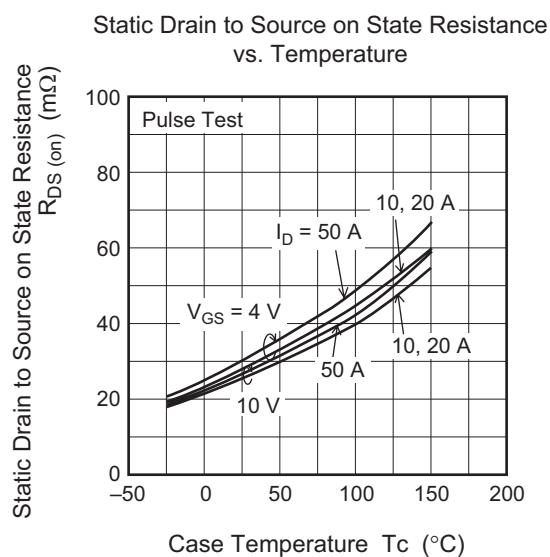


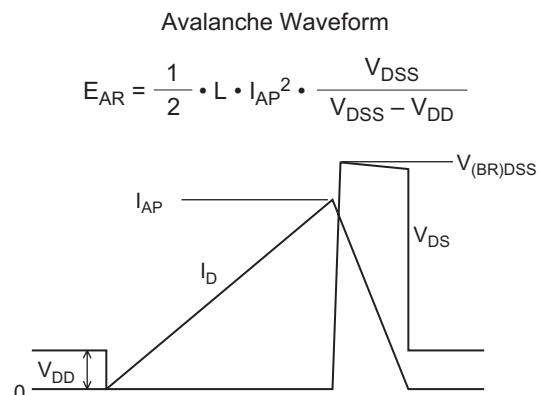
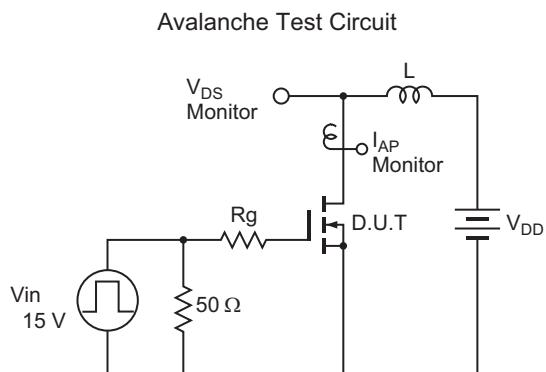
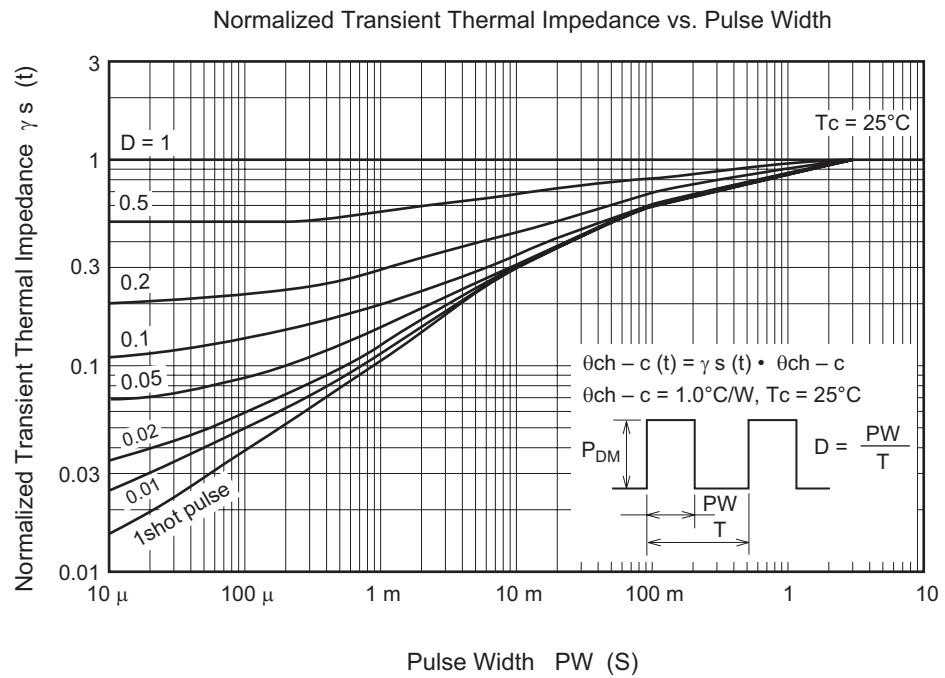
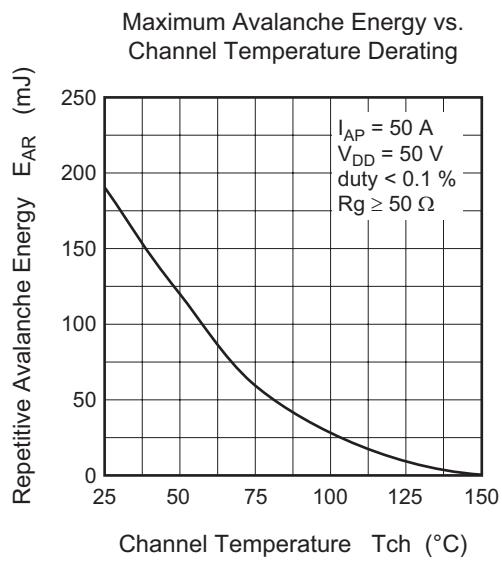
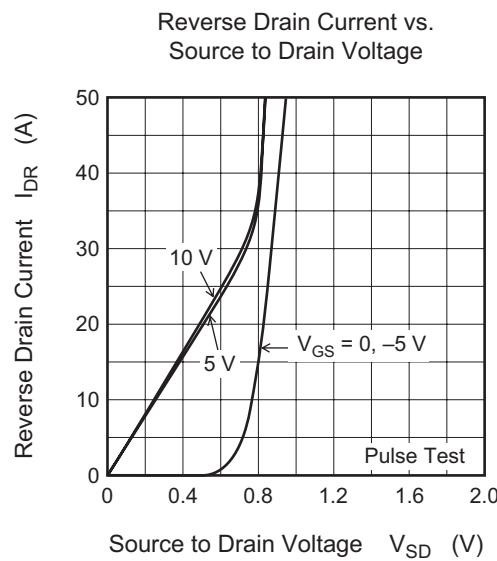
Typical Transfer Characteristics



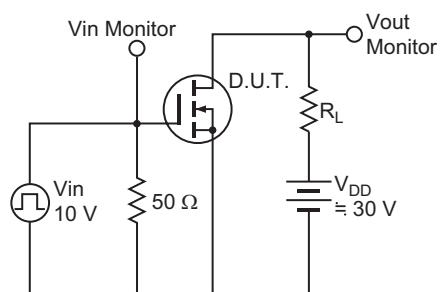
Drain to Source Saturation Voltage vs. Gate to Source Voltage



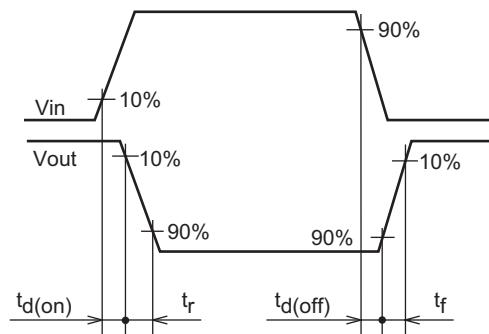




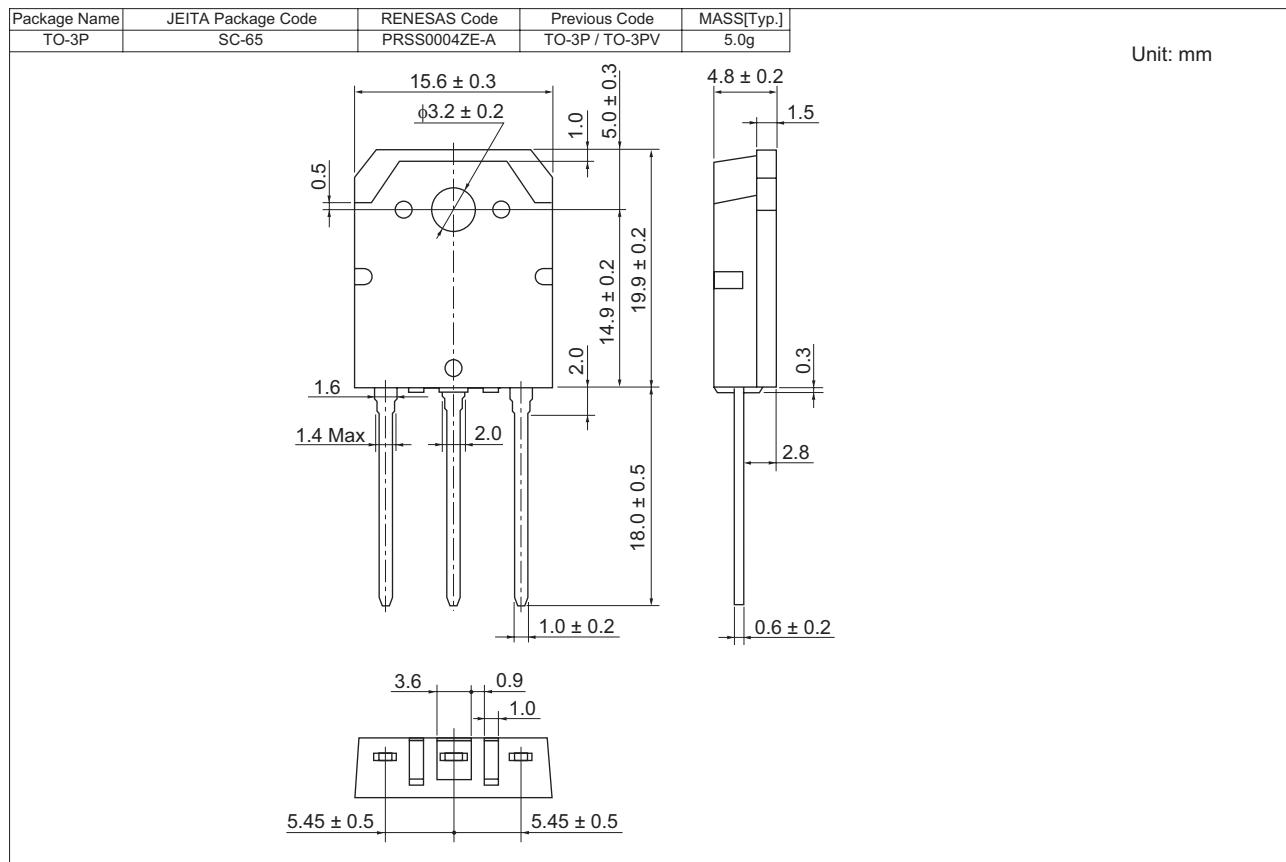
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SK3159-E	360 pcs	Box (Tube)

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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