

2SK1947

Silicon N Channel MOS FET

REJ03G0986-0200
(Previous: ADE-208-1334)
Rev.2.00
Sep 07, 2005

Application

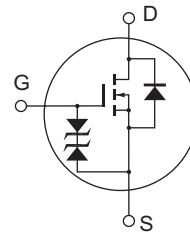
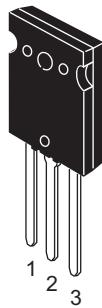
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- Built-in fast recovery diode ($t_{rr} = 140$ ns)
- Suitable for switching regulator, motor control

Outline

RENESAS Package code: PRSS0004ZF-A
(Package name: TO-3PL)



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

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	250	V
Gate to source voltage	V _{GSS}	±30	V
Drain current	I _D	50	A
Drain peak current	I _{D(pulse)} ^{*1}	200	A
Body to drain diode reverse drain current	I _{DR}	50	A
Channel dissipation	P _{ch} ^{*2}	200	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

Electrical Characteristics

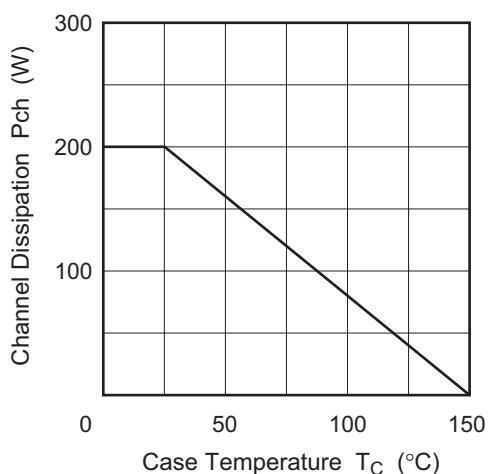
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	V _{(BR)DSS}	250	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source breakdown voltage	V _{(BR)GSS}	±30	—	—	V	I _G = ±100 µA, V _{DS} = 0
Gate to source leak current	I _{GSS}	—	—	±10	µA	V _{GS} = ±25 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	250	µA	V _{DS} = 200 V, V _{GS} = 0
Gate to source cutoff voltage	V _{GS(off)}	2.0	—	3.0	V	I _D = 1 mA, V _{DS} = 10 V
Static drain to source on state resistance	R _{DS(on)}	—	0.047	0.06	Ω	I _D = 25 A, V _{GS} = 10 V ^{*3}
Forward transfer admittance	y _{fs}	20	30	—	S	I _D = 25 A, V _{DS} = 10 V ^{*3}
Input capacitance	C _{iss}	—	5810	—	pF	V _{DS} = 10 V, V _{GS} = 0,
Output capacitance	C _{oss}	—	2360	—	pF	f = 1 MHz
Reverse transfer capacitance	C _{rss}	—	270	—	pF	
Turn-on delay time	t _{d(on)}	—	75	—	ns	I _D = 25 A, V _{GS} = 10 V,
Rise time	t _r	—	270	—	ns	R _L = 1.2 Ω
Turn-off delay time	t _{d(off)}	—	420	—	ns	
Fall time	t _f	—	200	—	ns	
Body to drain diode forward voltage	V _{DF}	—	1.2	—	V	I _F = 50 A, V _{GS} = 0
Body to drain diode reverse recovery time	t _{rr}	—	140	—	ns	I _F = 50 A, V _{GS} = 0, di _F /dt = 100 A/µs

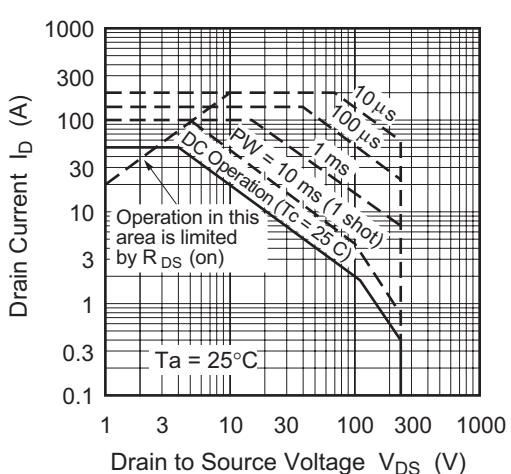
Note: 3. Pulse Test

Main Characteristics

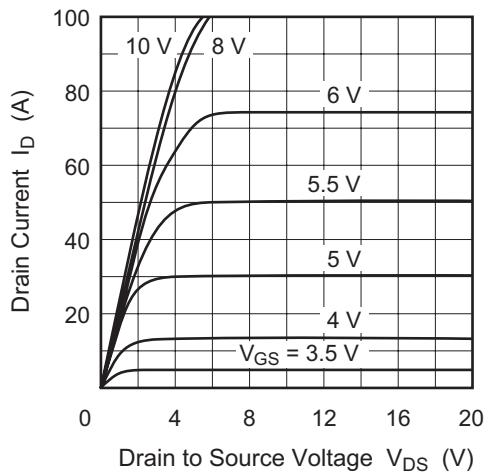
Power vs. Temperature Derating



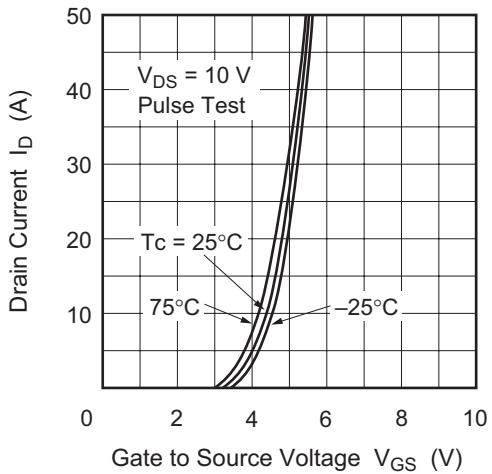
Maximum Safe Operation Area



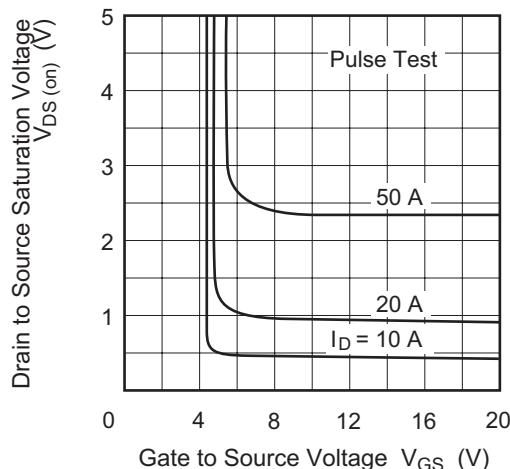
Typical Output Characteristics



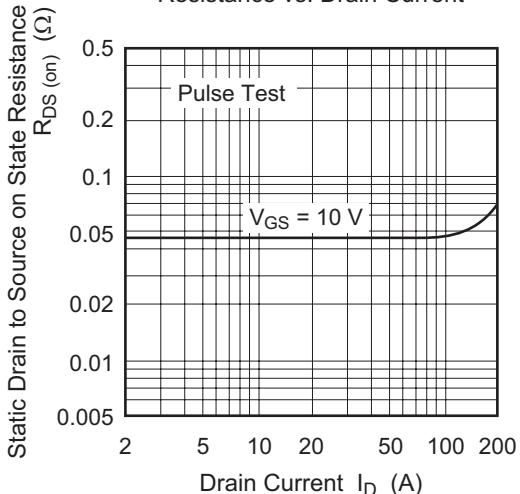
Typical Transfer Characteristics

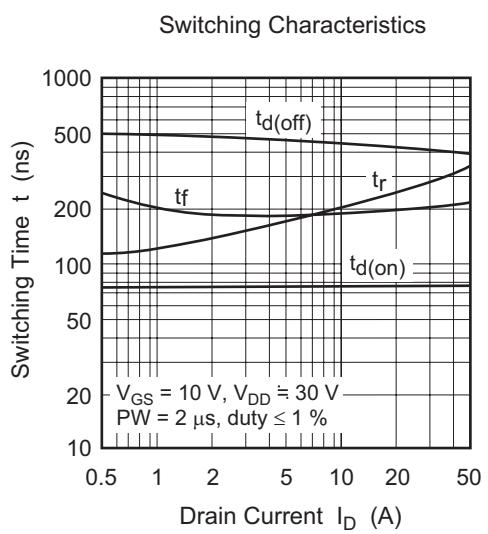
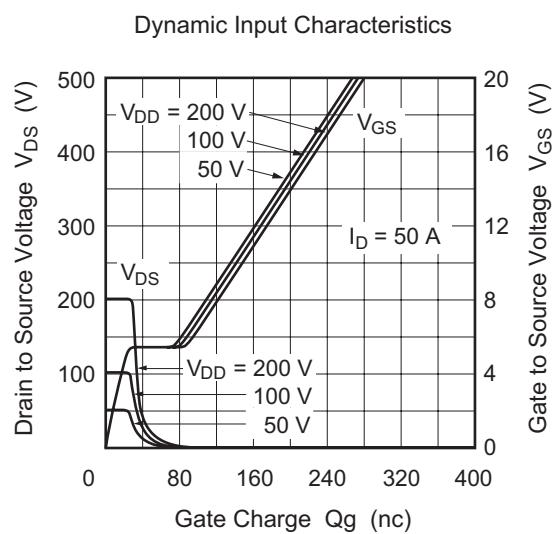
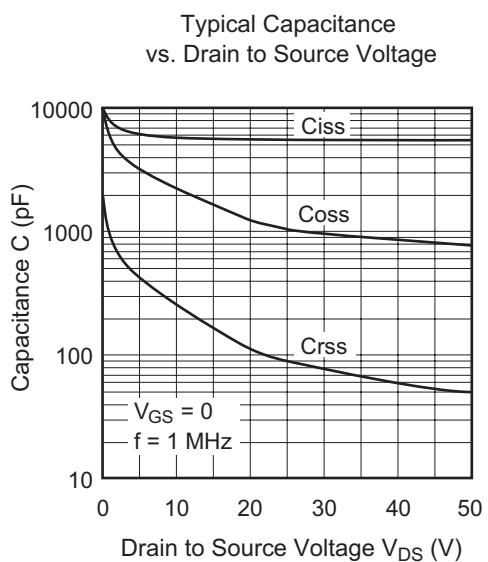
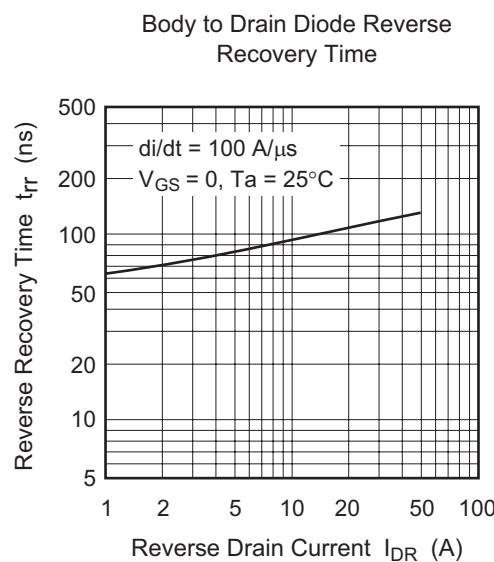
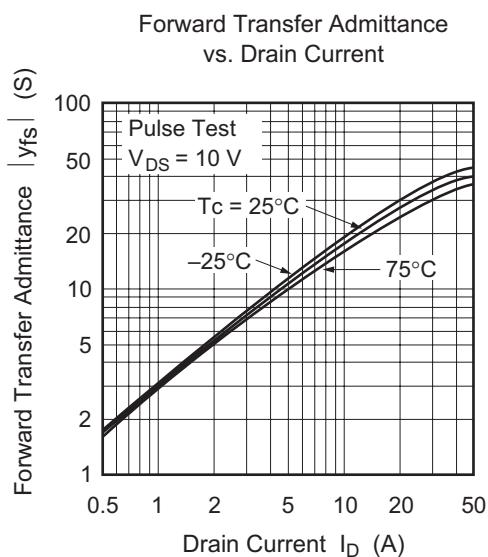
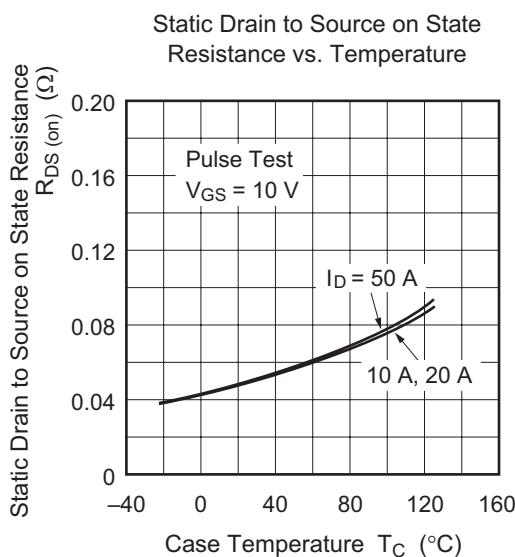


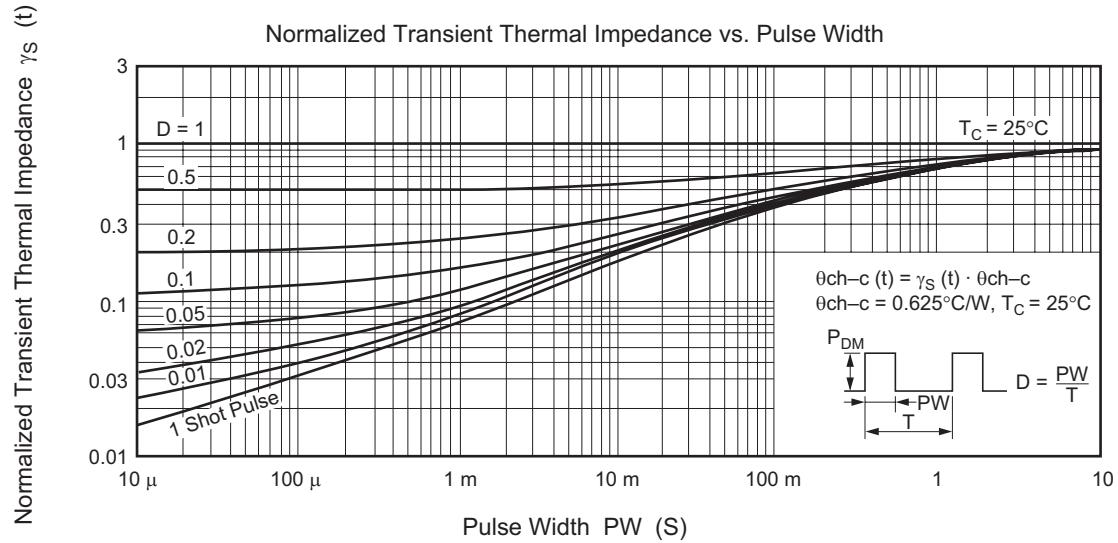
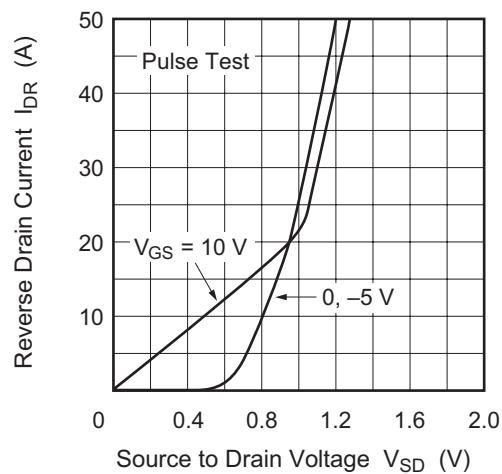
Drain to Source Saturation Voltage vs. Gate to Source Voltage



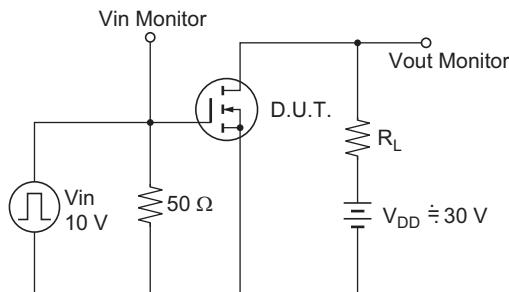
Static Drain to Source on State Resistance vs. Drain Current



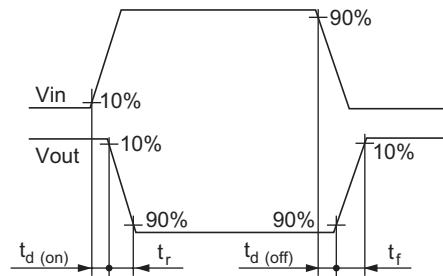


Reverse Drain Current vs.
Source to Drain Voltage

Switching Time Test Circuit



Waveforms



Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]	Unit: mm
—	PRSS0004ZF-A	TO-3PL / TO-3PLV	9.9g	

Ordering Information

Part Name	Quantity	Shipping Container
2SK1947-E	500 pcs	Box (Case)

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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