FS50KMJ-2

High-Speed Switching Use
Nch Power MOS FET

REJ03G1420-0200
(Previous: MEJ02G0067-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 4 V
- V_{DSS} : 100 V
- $r_{DS(ON)\ (max)}$: 48 mΩ
- I_D : 50 A
- Integrated Fast Recovery Diode (TYP.) : 90 ns
- Viso : 2000 V

Outline

RENESAS Package code: PRSS0003AB-A
(Package name: TO-220FN)



1. Gate
2. Drain
3. Source

Not recommend for new design

Applications

Motor control, Lamp control, Solenoid control, DC-DC converters, etc.

Maximum Ratings

(Tc = 25°C)

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	100	V	V_{GS} = 0 V
Gate-source voltage	V_{GSS}	±20	V	V_{DS} = 0 V
Drain current	I_D	50	A	
Drain current (Pulsed)	I_{DM}	200	A	
Avalanche drain current (Pulsed)	I_{DA}	50	A	L = 50 µH
Source current	I_S	50	A	
Source current (Pulsed)	I_{SM}	200	A	
Maximum power dissipation	P_D	30	W	
Channel temperature	Tch	– 55 to +150	°C	
Storage temperature	Tstg	– 55 to +150	°C	
Isolation voltage	Viso	2000	V	AC for 1 minute, Terminal to case
Mass	—	2.0	g	Typical value

Electrical Characteristics

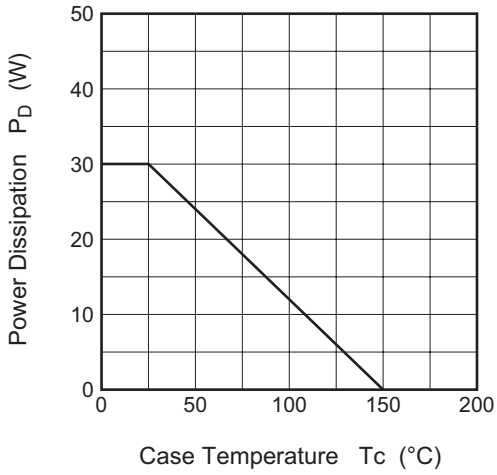
(Tch = 25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	I_D = 1 mA, V_{GS} = 0 V
Gate-source leakage current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±20 V, V_{DS} = 0 V
Drain-source leakage current	I_{DSS}	—	—	0.1	mA	V_{DS} = 100 V, V_{GS} = 0 V
Gate-source threshold voltage	$V_{GS(th)}$	1.0	1.5	2.0	V	I_D = 1 mA, V_{DS} = 10 V
Drain-source on-state resistance	$r_{DS(ON)}$	—	37	48	mΩ	I_D = 25 A, V_{GS} = 10 V
Drain-source on-state resistance	$r_{DS(ON)}$	—	40	52	mΩ	I_D = 25 A, V_{GS} = 4 V
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.93	1.20	V	I_D = 25 A, V_{GS} = 10 V
Forward transfer admittance	$\lvert y_{fs} \rvert$	—	40	—	S	I_D = 25 A, V_{DS} = 10 V
Input capacitance	Ciss	—	3000	—	pF	V_{DS} = 10 V, V_{GS} = 0 V, f = 1MHz
Output capacitance	Coss	—	410	—	pF	
Reverse transfer capacitance	Crss	—	210	—	pF	
Turn-on delay time	$t_{d(on)}$	—	22	—	ns	V_{DD} = 50 V, I_D = 25 A, V_{GS} = 10 V, R_{GEN} = R_{GS} = 50 Ω
Rise time	t_r	—	65	—	ns	
Turn-off delay time	$t_{d(off)}$	—	270	—	ns	
Fall time	t_f	—	160	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	I_S = 25 A, V_{GS} = 0 V
Thermal resistance	$R_{th(ch-c)}$	—	—	4.17	°C/W	Channel to case
Reverse recovery time	t_{rr}	—	90	—	ns	I_S = 50 A, d_{is}/d_t = – 100 A/µs

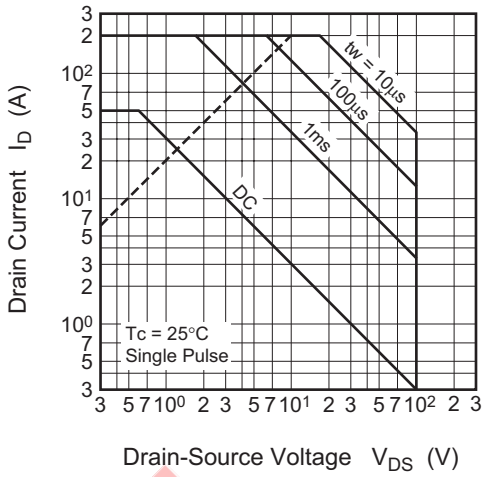
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Performance Curves

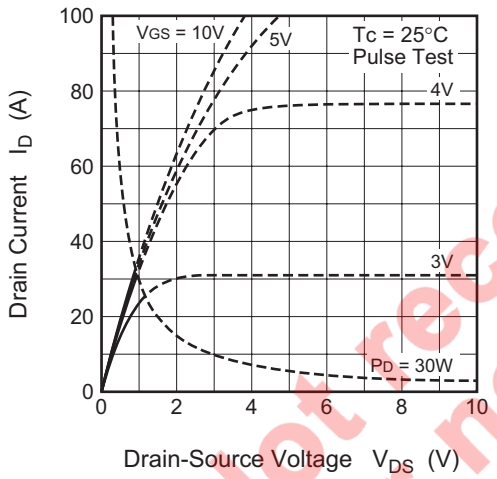
Power Dissipation Derating Curve



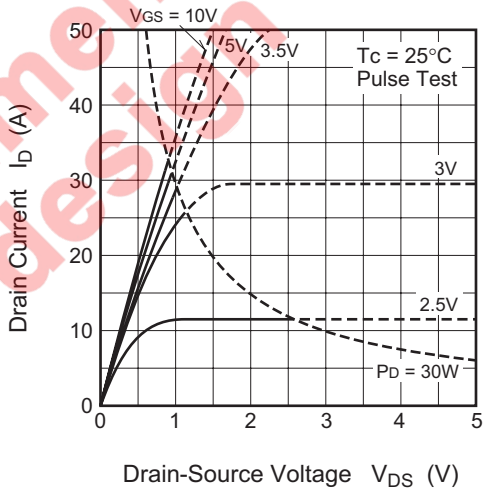
Maximum Safe Operating Area



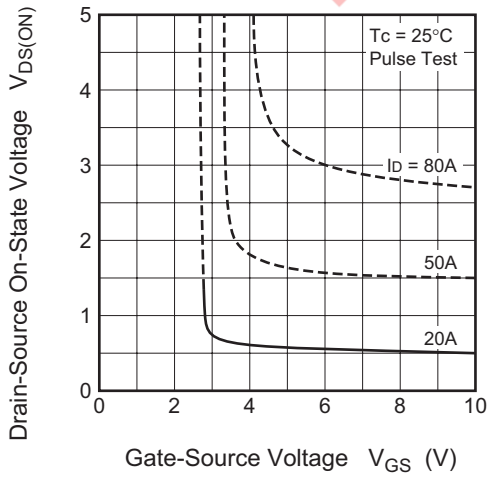
Output Characteristics (Typical)



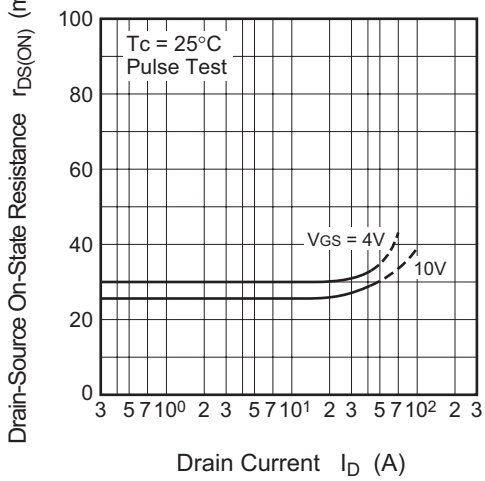
Output Characteristics (Typical)



On-State Voltage vs.
Gate-Source Voltage (Typical)

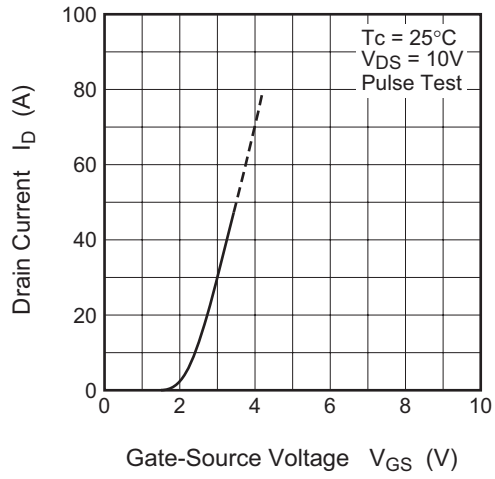


On-State Resistance vs.
Drain Current (Typical)

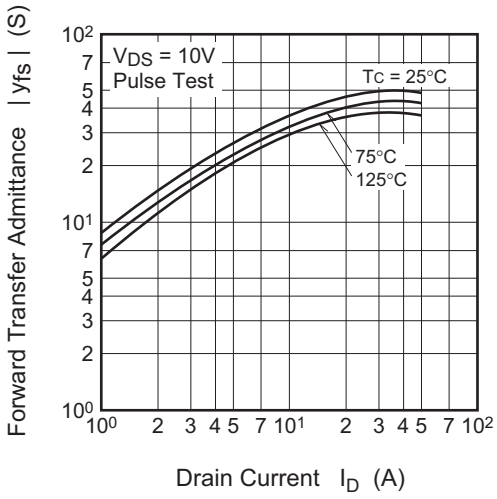


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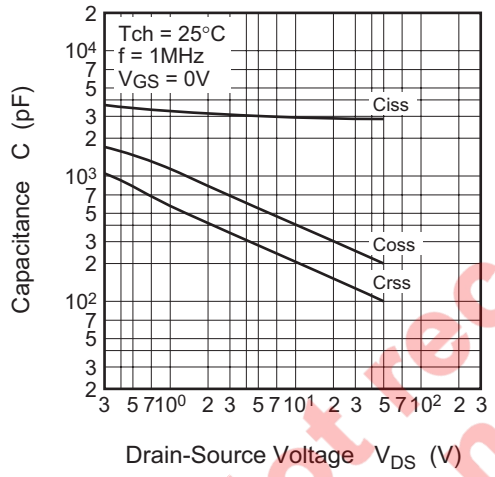
Transfer Characteristics (Typical)



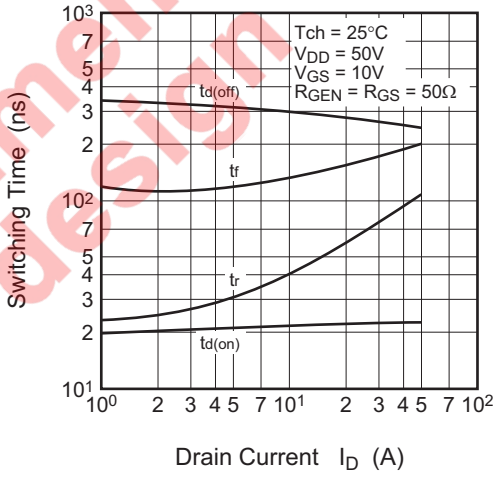
Forward Transfer Admittance vs. Drain Current (Typical)



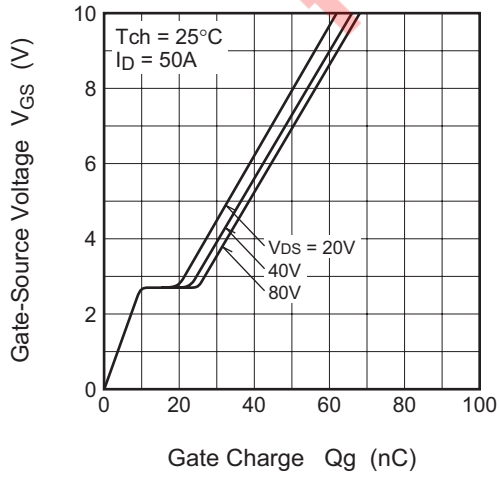
Capacitance vs. Drain-Source Voltage (Typical)



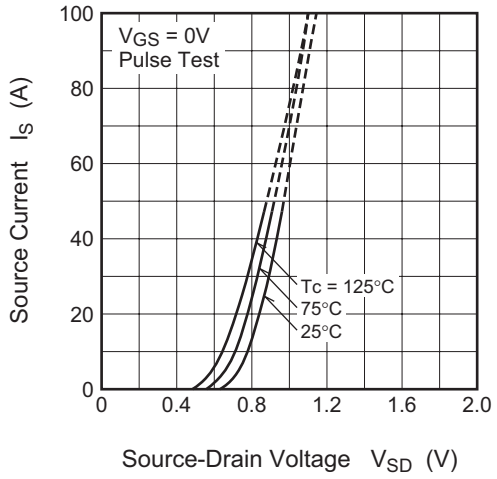
Switching Characteristics (Typical)



Gate-Source Voltage vs. Gate Charge (Typical)

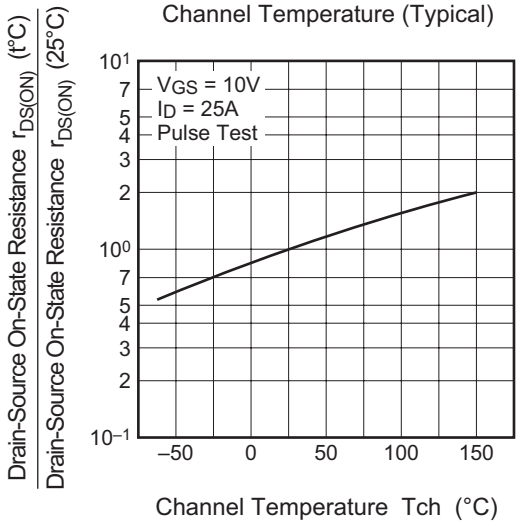


Source-Drain Diode Forward Characteristics (Typical)

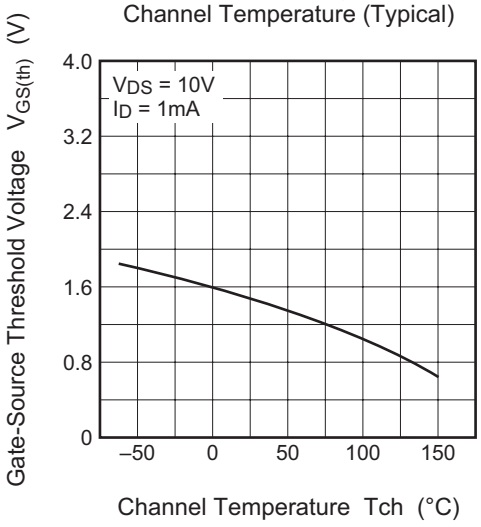


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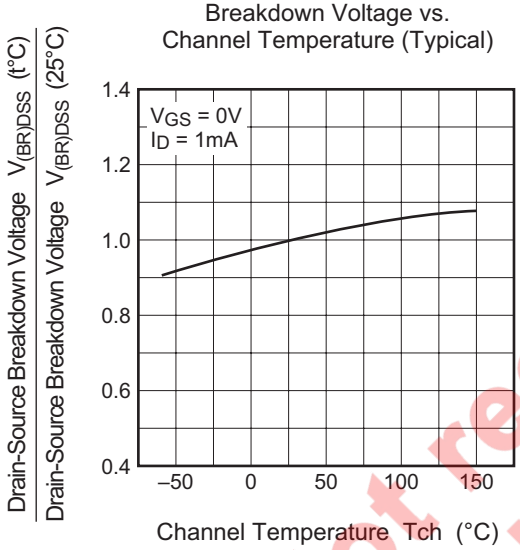
On-State Resistance vs.
Channel Temperature (Typical)



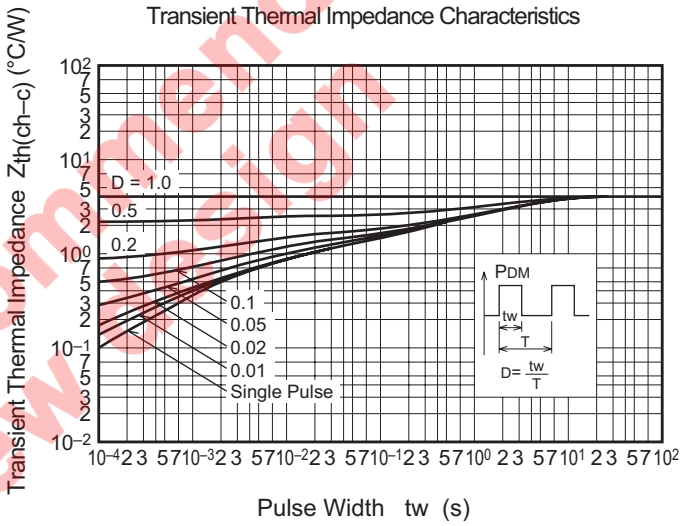
Threshold Voltage vs.
Channel Temperature (Typical)



Breakdown Voltage vs.
Channel Temperature (Typical)

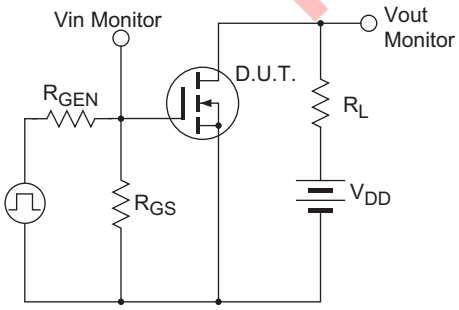


Transient Thermal Impedance Characteristics

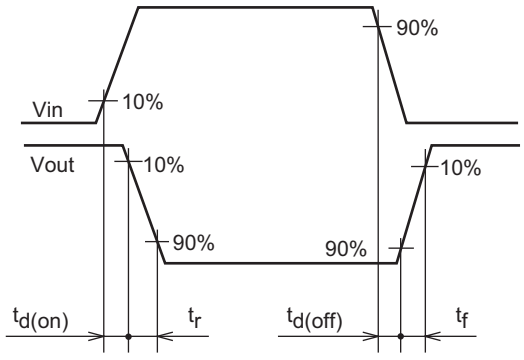


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Switching Time Measurement Circuit



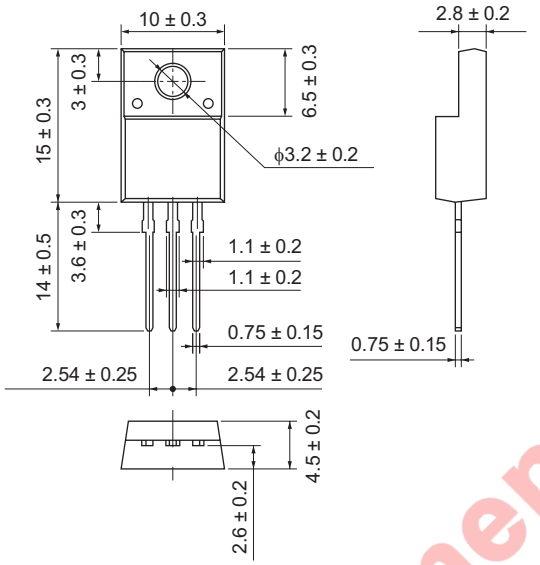
Switching Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FN	—	PRSS0003AB-A	—	2.0g

Unit: mm



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Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	FS50KMJ-2
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FS50KMJ-2-A8

Note : Please confirm the specification about the shipping in detail.

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