H5N2507P

250V - 50A - MOS FET
High Speed Power Switching

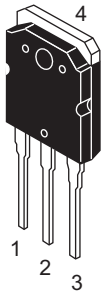
R07DS0877EJ0200
(Previous: RJJ03G0646-0100)
Rev.2.00
Sep 12, 2012

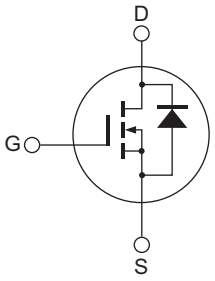
Features

- Low on-resistance
  $R_{DS(on)}$ = 0.04 Ω typ. (at I_D = 25 A, V_{GS}= 10 V, Ta = 25°C)
- Low leakage current
- High speed switching
- Low gate charge
- Built-in fast recovery diode

Outline

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





1. Gate
2. Drain
3. Source
4. Drain

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	$I_{D\ (pulse)}$ Note1	200	A
Body-Drain diode reverse Drain current	I_{DR}	50	A
Avalanche current	I_{AP} Note3	35	A
Channel dissipation	Pch Note2	150	W
Channel to case thermal impedance	θch-c	0.833	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. STch = 25°C, Tch ≤ 150°C

Electrical Characteristics

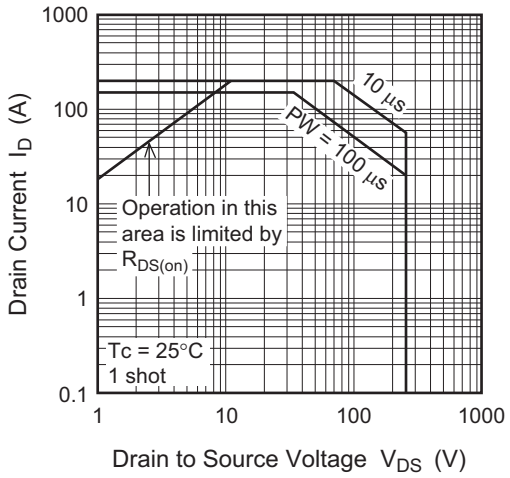
(Ta = 25°C)

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
Zero Gate voltage Drain current	I_{DSS}	—	—	10	μA	V_{DS} = 250 V, V_{GS} = 0
Gate to Source leak current	I_{GSS}	—	—	±0.1	μA	V_{GS} = ±30 V, V_{DS} = 0
Gate to Source cutoff voltage	$V_{GS(off)}$	2.0	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.040	0.055	Ω	I_D = 25 A, V_{GS}= 10 V Note4
Forward transfer admittance	$\|y_{fs}\|$	20	36	—	S	I_D = 25 A, V_{DS} = 10 V Note4
Input capacitance	Ciss	—	5000	—	pF	V_{DS} = 25 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	640	—	pF	
Reverse transfer capacitance	Crss	—	105	—	pF	
Turn-on delay time	$t_{d(on)}$	—	55	—	ns	I_D= 25 A V_{GS} = 10 V R_L = 5 Ω Rg = 10 Ω
Rise time	t_r	—	200	—	ns	
Turn-off delay time	$t_{d(off)}$	—	250	—	ns	
Fall time	t_f	—	200	—	ns	
Total Gate charge	Qg	—	145	—	nC	V_{DD} = 200 V V_{GS} = 10 V I_D = 50 A
Gate to Source charge	Qgs	—	25	—	nC	
Gate to Drain charge	Qgd	—	65	—	nC	
Body-Drain diode forward voltage	V_{DF}	—	1.0	1.5	V	I_F = 50 A, V_{GS} = 0 Note4
Body-Drain diode reverse recovery time	t_{rr}	—	145	—	ns	I_F = 50 A, V_{GS} = 0 di_F/dt = 100A/μs
Body-Drain diode reverse recovery charge	Q_{rr}	—	0.7	—	μC	

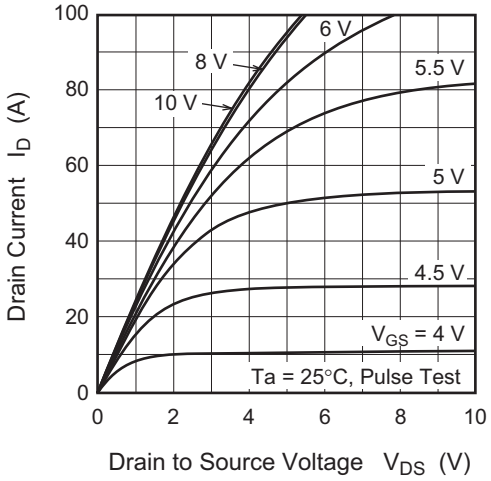
Note: 4. Pulse test

Main Characteristics

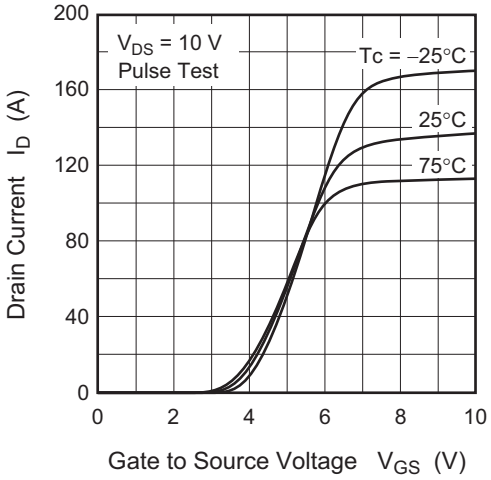
Maximum Safe Operation Area



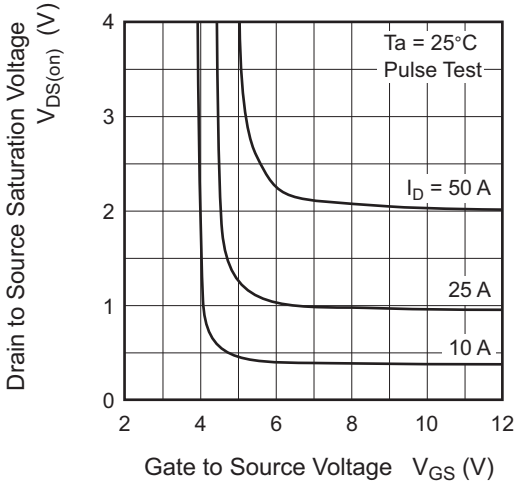
Typical Output Characteristics



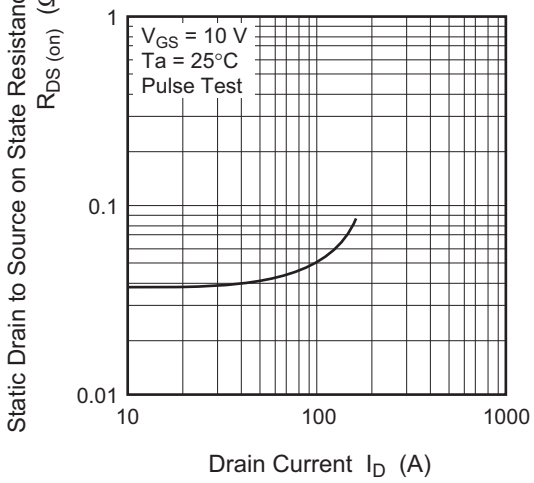
Typical Transfer Characteristics



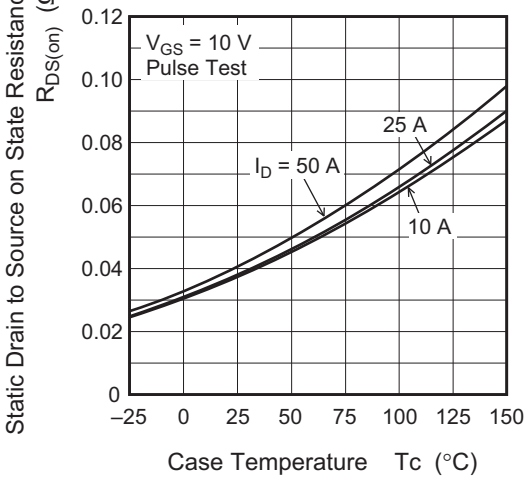
Drain to Source Saturation Voltage vs. Gate to Source Voltage (Typical)



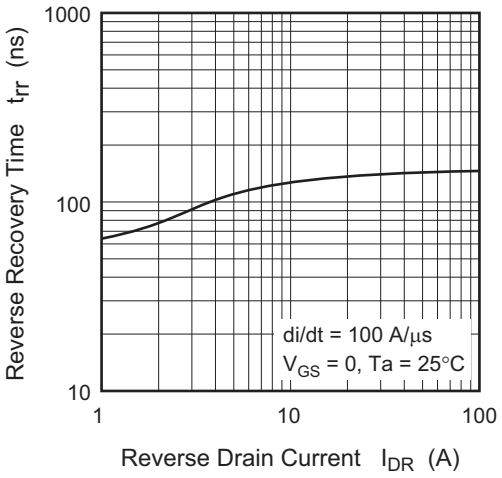
Static Drain to Source on State Resistance vs. Drain Current (Typical)



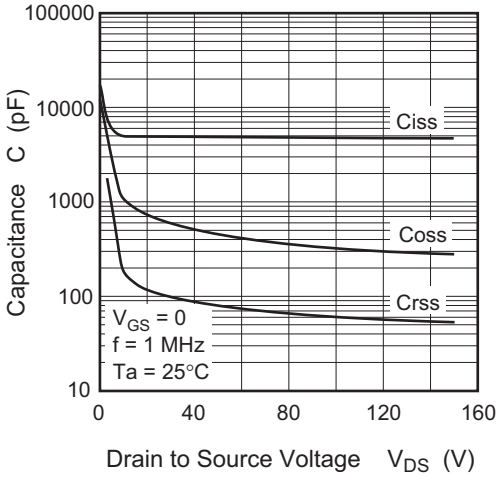
Static Drain to Source on State Resistance vs. Temperature (Typical)



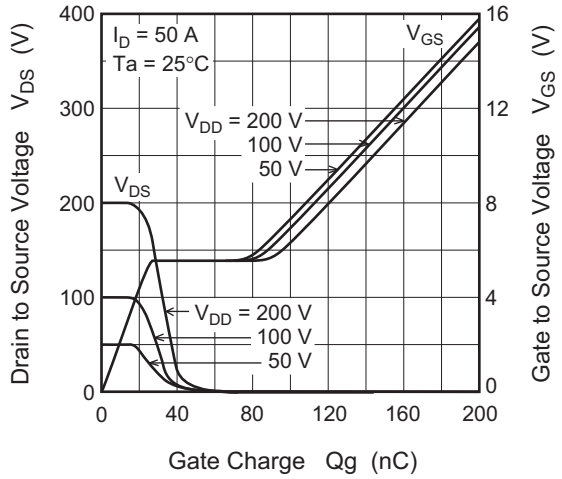
Body-Drain Diode Reverse Recovery Time (Typical)



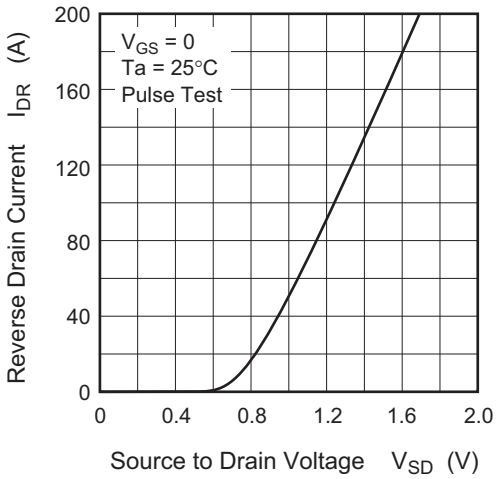
Typical Capacitance vs. Drain to Source Voltage



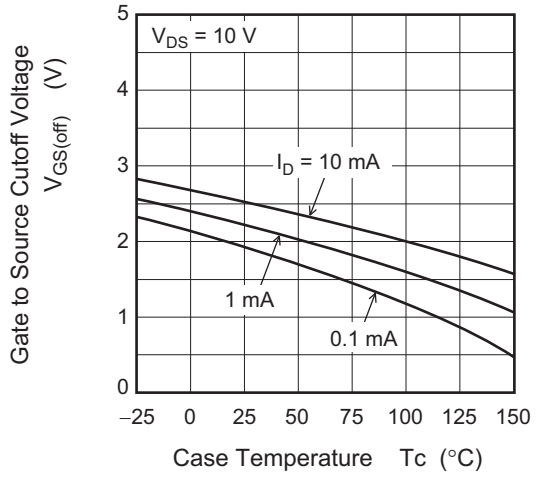
Dynamic Input Characteristics



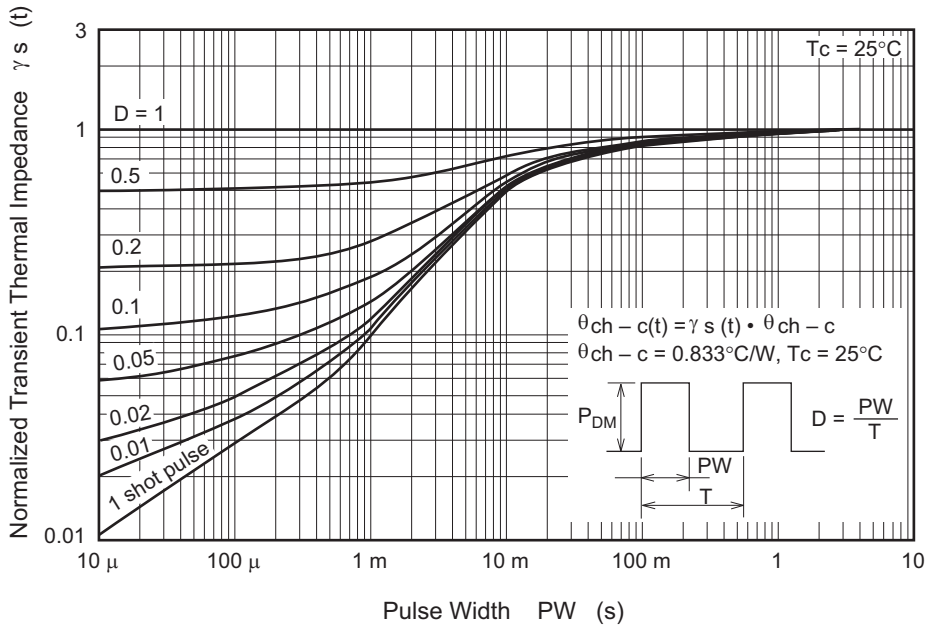
Reverse Drain Current vs. Source to Drain Voltage (Typical)



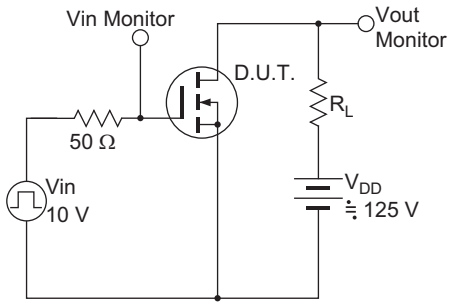
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



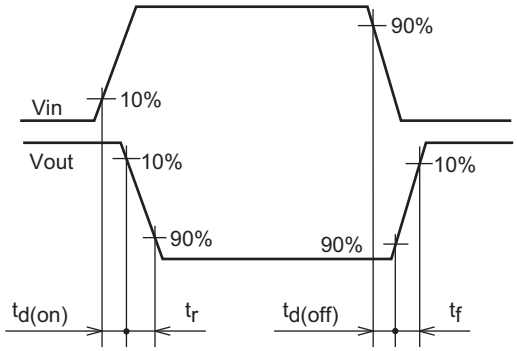
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



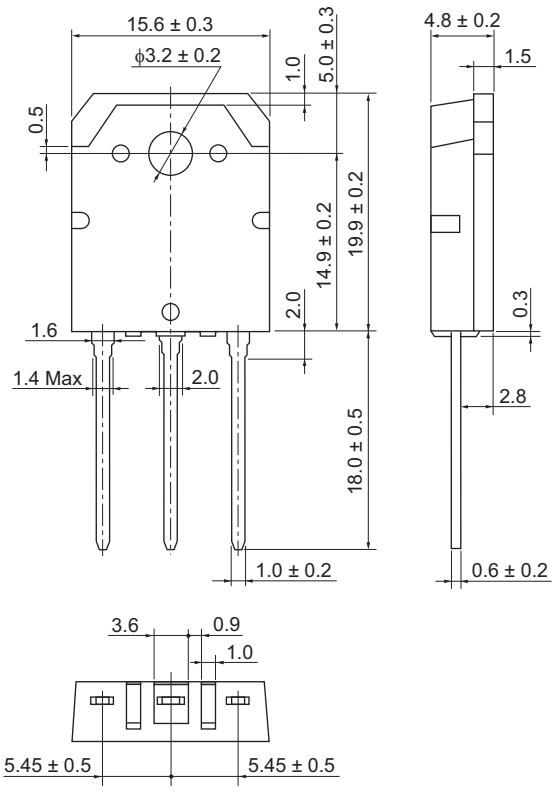
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-3P	SC-65	PRSS0004ZE-A	TO-3P / TO-3PV	5.0g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
H5N2507P	360 pcs	Box (Tube)

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