

H5N2507P

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

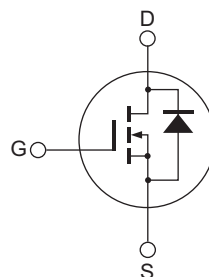
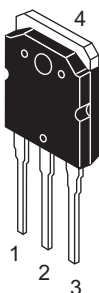
R07DS0877EJ0200
(Previous: RJJ03G0646-0100)
Rev.2.00
Sep 12, 2012

Features

- Low on-resistance
 $R_{DS(on)} = 0.04 \Omega$ typ. (at $I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$, $T_a = 25^\circ\text{C}$)
- 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

($T_a = 25^\circ\text{C}$)

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	P_{ch} ^{Note2}	150	W
Channel to case thermal impedance	θ_{ch-c}	0.833	$^\circ\text{C/W}$
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ\text{C}$
3. $STch = 25^\circ\text{C}$, $T_{ch} \leq 150^\circ\text{C}$

Electrical Characteristics

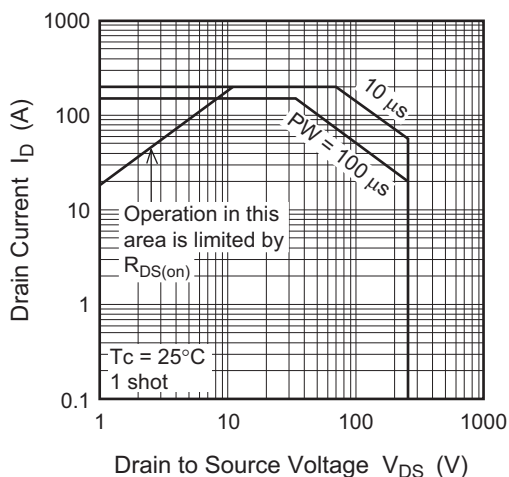
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	250	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero Gate voltage Drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 250 \text{ V}$, $V_{GS} = 0$
Gate to Source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
Gate to Source cutoff voltage	$V_{GS(off)}$	2.0	—	4.0	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.040	0.055	Ω	$I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	20	36	—	S	$I_D = 25 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	5000	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	C_{oss}	—	640	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	105	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	55	—	ns	$I_D = 25 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 5 \Omega$ $R_g = 10 \Omega$
Rise time	t_r	—	200	—	ns	
Turn-off delay time	$t_{d(off)}$	—	250	—	ns	
Fall time	t_f	—	200	—	ns	
Total Gate charge	Q_g	—	145	—	nC	$V_{DD} = 200 \text{ V}$
Gate to Source charge	Q_{gs}	—	25	—	nC	$V_{GS} = 10 \text{ V}$
Gate to Drain charge	Q_{gd}	—	65	—	nC	$I_D = 50 \text{ A}$
Body-Drain diode forward voltage	V_{DF}	—	1.0	1.5	V	$I_F = 50 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-Drain diode reverse recovery time	t_{rr}	—	145	—	ns	$I_F = 50 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$
Body-Drain diode reverse recovery charge	Q_{rr}	—	0.7	—	μC	

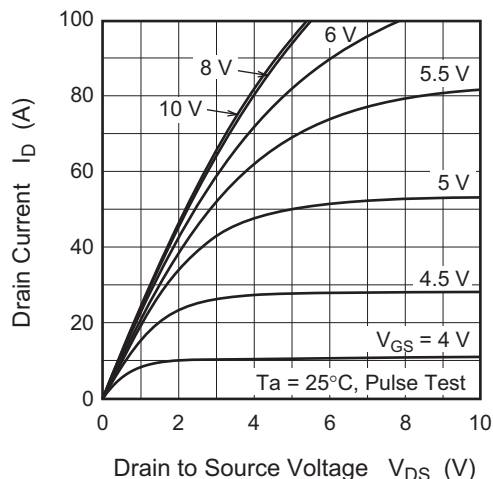
Note: 4. Pulse test

Main Characteristics

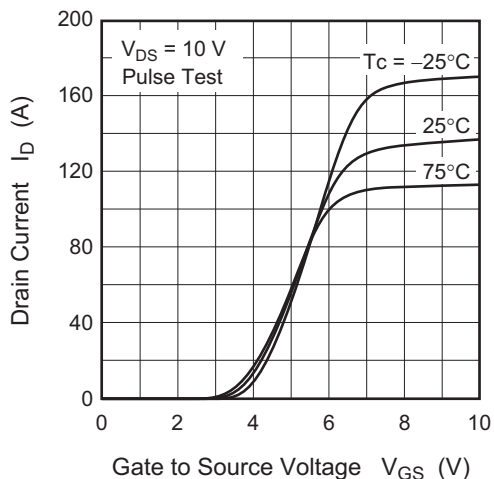
Maximum Safe Operation Area



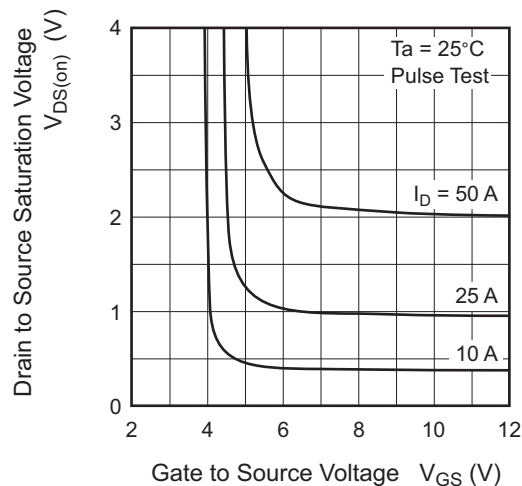
Typical Output Characteristics



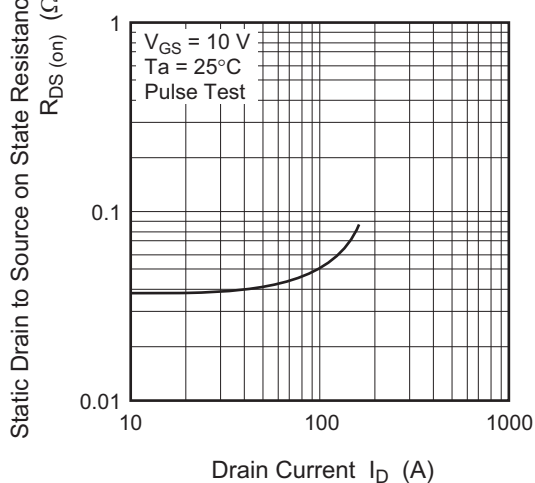
Typical Transfer Characteristics



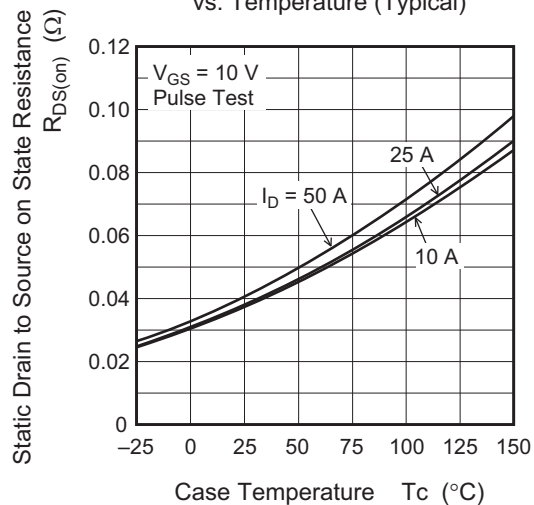
Drain to Source Saturation Voltage vs. Gate to Source Voltage (Typical)



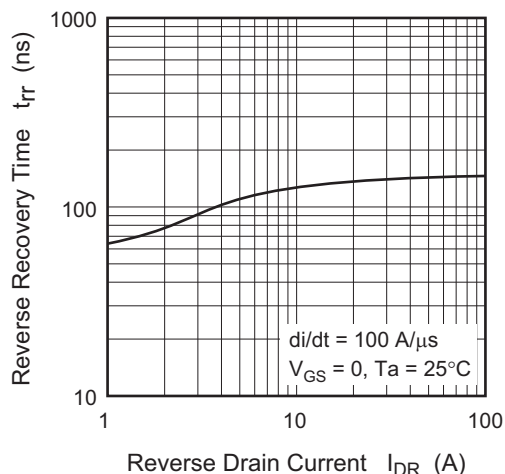
Static Drain to Source on State Resistance vs. Drain Current (Typical)



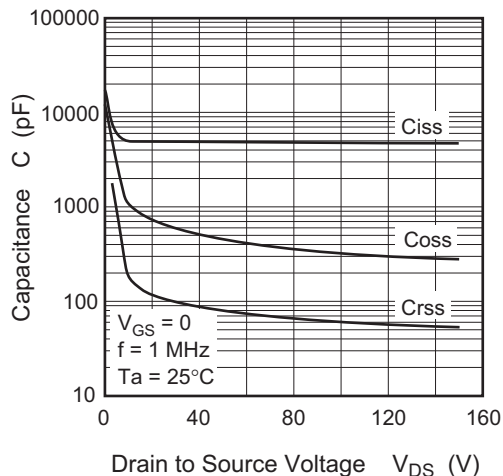
Static Drain to Source on State Resistance vs. Temperature (Typical)



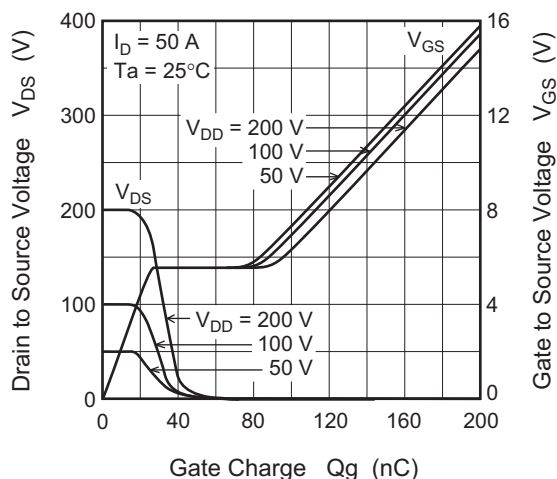
Body-Drain Diode Reverse Recovery Time (Typical)



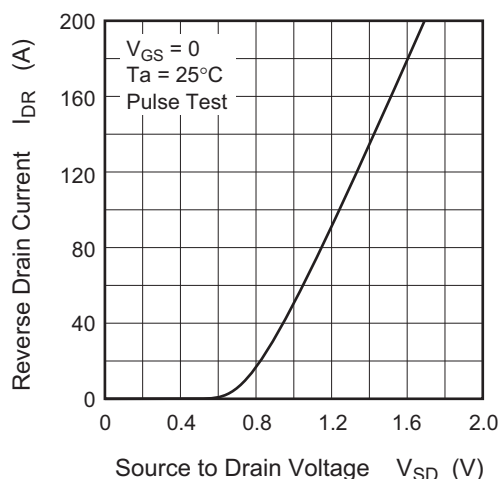
Typical Capacitance vs. Drain to Source Voltage



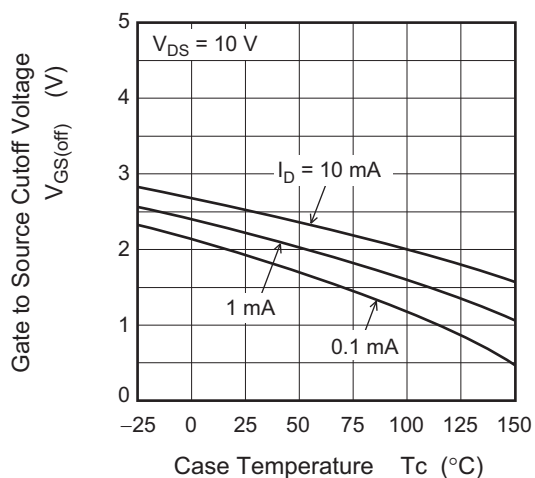
Dynamic Input Characteristics

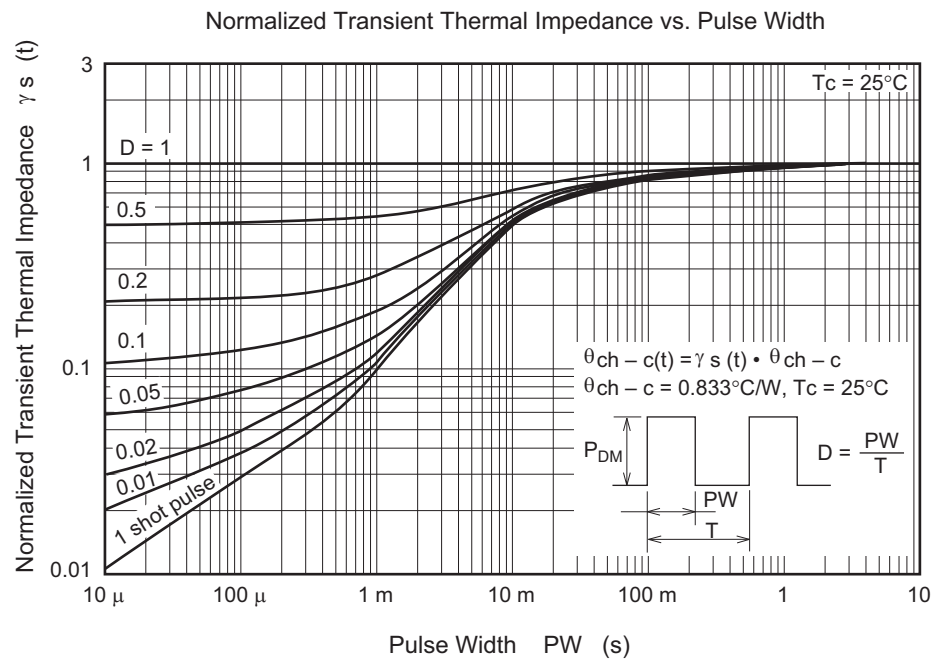


Reverse Drain Current vs. Source to Drain Voltage (Typical)

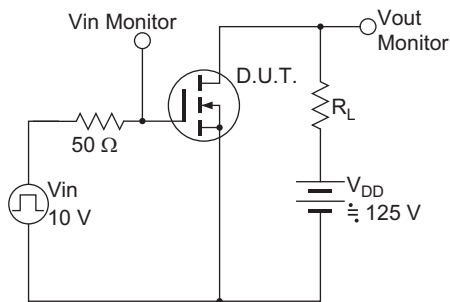


Gate to Source Cutoff Voltage vs. Case Temperature (Typical)

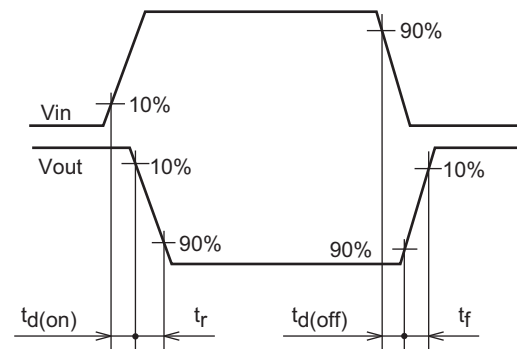




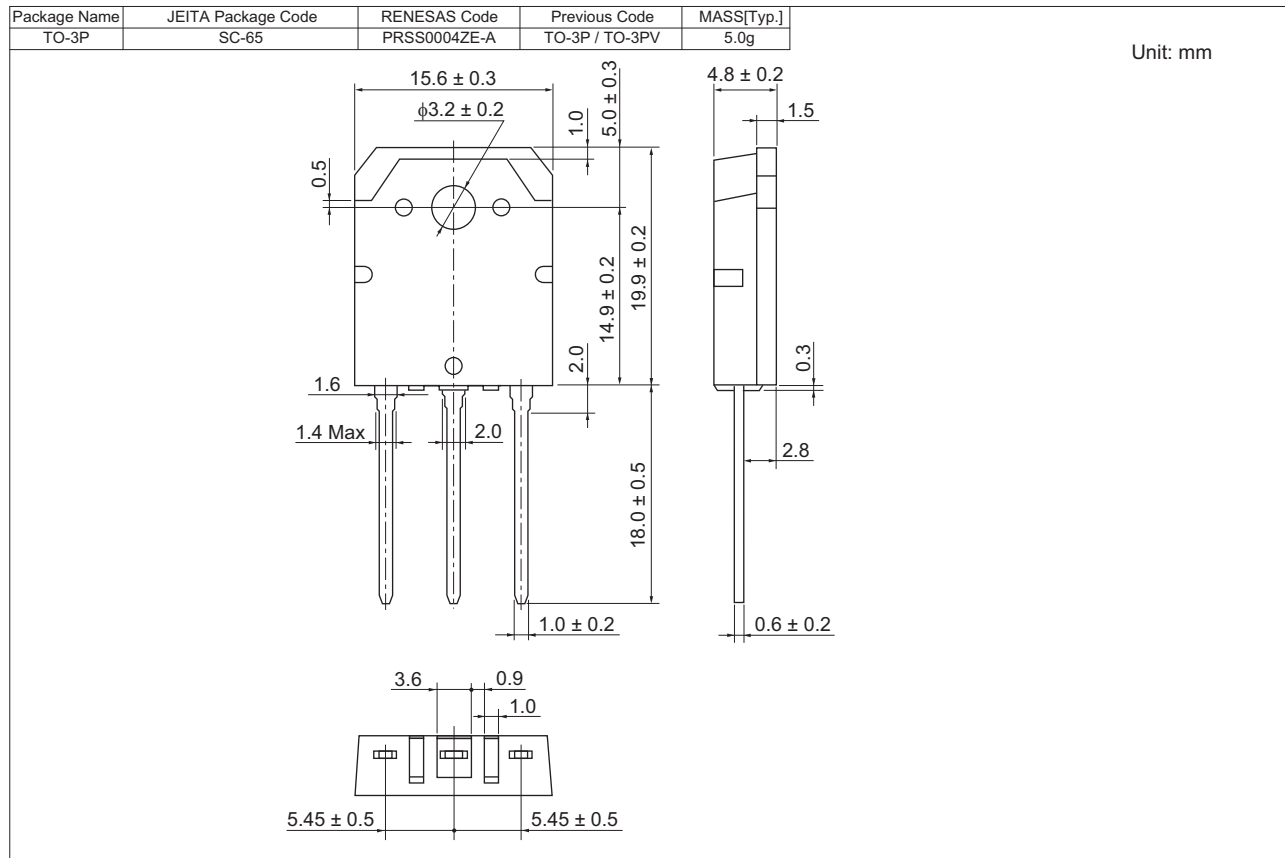
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

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

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