

H7N1004AB

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G1579-0100

Rev.1.00

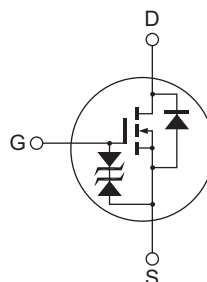
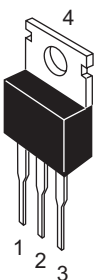
Sep 03, 2007

Features

- Low on-resistance
 $R_{DS(on)} = 25 \text{ m}\Omega$ typ.
- Low drive current
- Available for 4.5 V gate drive

Outline

RENESAS Package code: PRSS0004AC-A
(Package name: TO-220AB)



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

Absolute Maximum Ratings

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

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	100	V
Gate to source voltage	V_{GSS}	± 20	V
Drain current	I_D	30	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	100	A
Body-drain diode reverse drain current	I_{DR}	30	A
Avalanche current	I_{AP} ^{Note2}	15	A
Avalanche energy	E_{AR} ^{Note2}	22.5	mJ
Channel dissipation	P_{ch} ^{Note3}	50	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

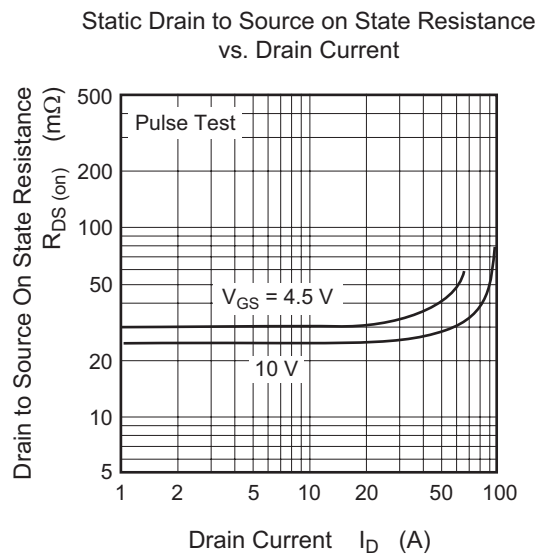
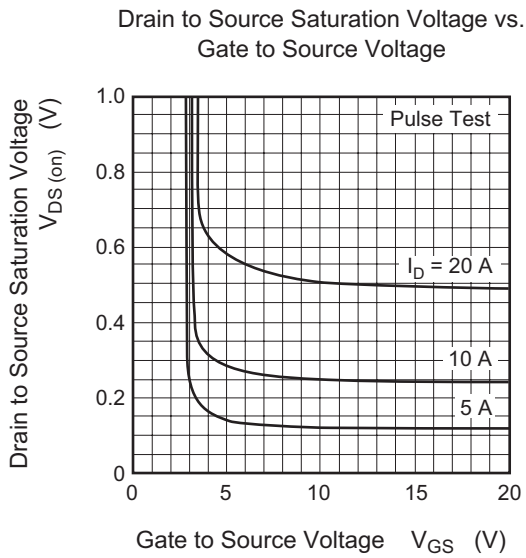
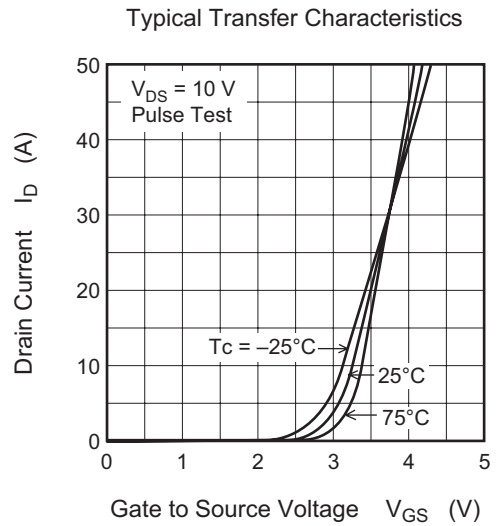
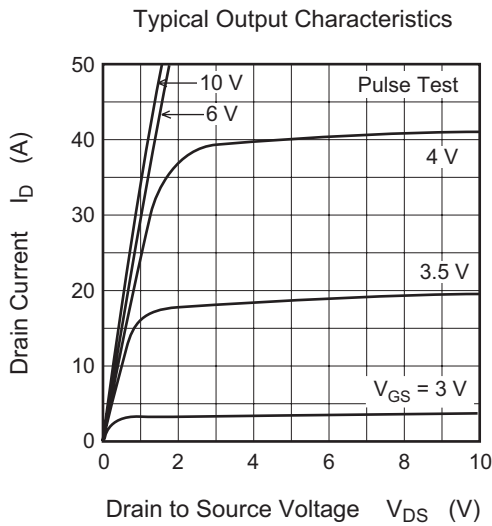
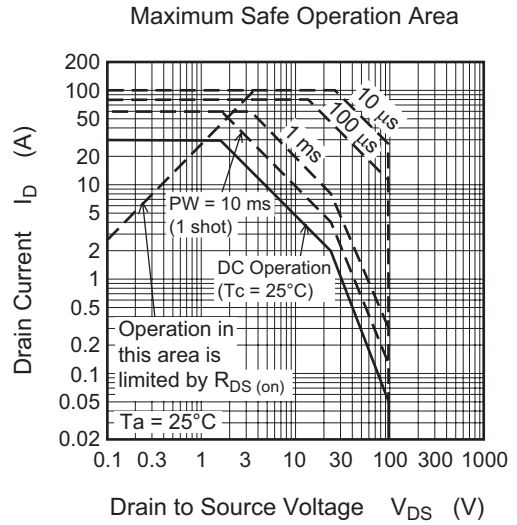
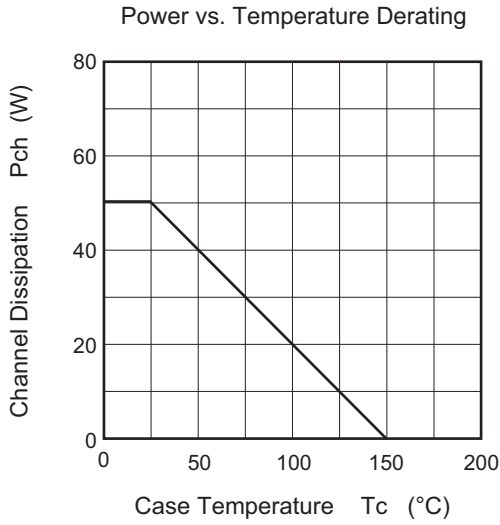
- Notes: 1. $PW \leq 10 \text{ ms}$, duty cycle $\leq 1\%$
 2. Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$
 3. Value at $T_c = 25^\circ\text{C}$

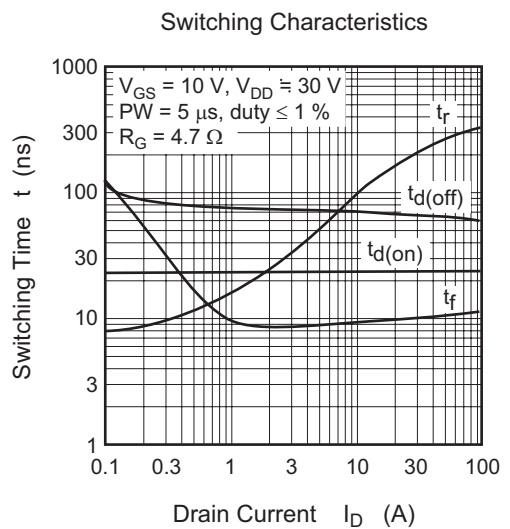
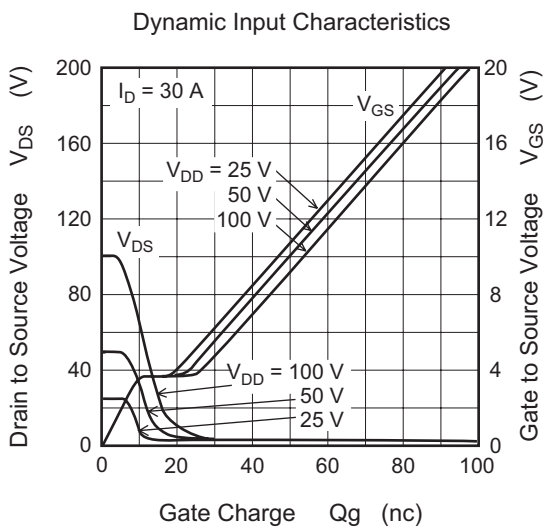
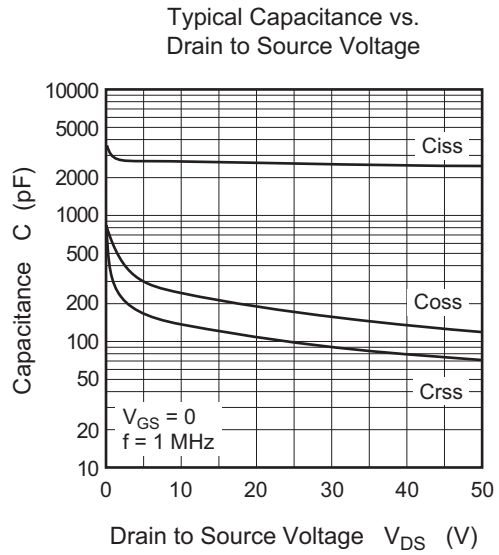
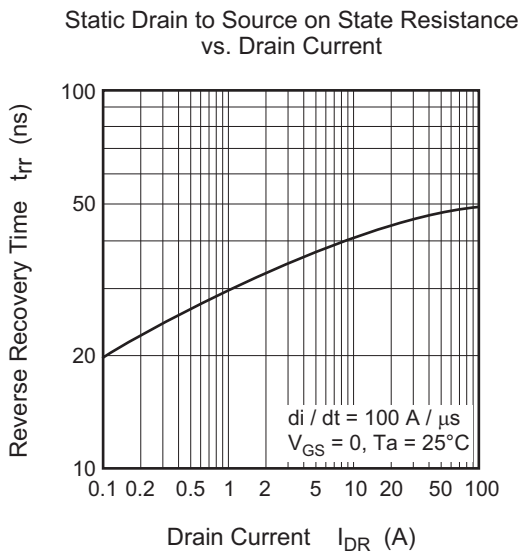
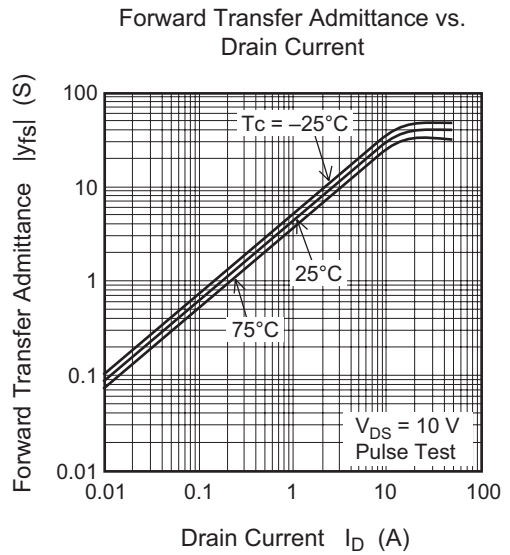
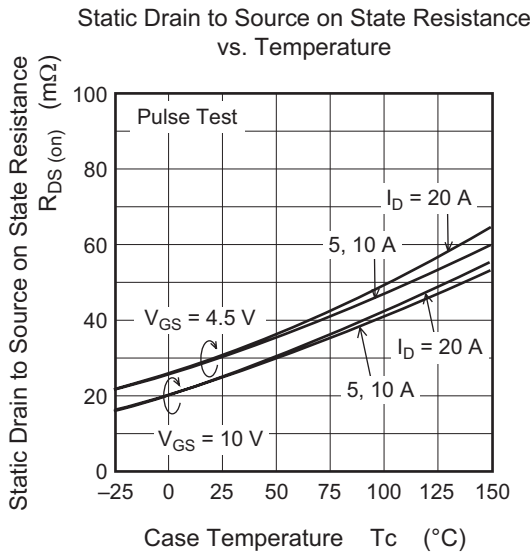
Electrical Characteristics

(Ta = 25°C)

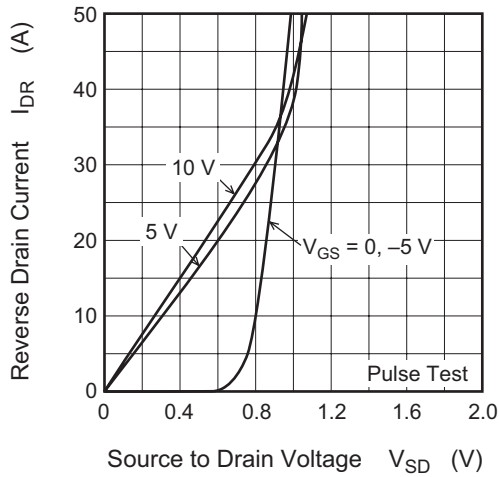
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 100 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Static drain to source on state resistance	$R_{DS(on)}$	—	25	35	m Ω	$I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
		—	30	45	m Ω	$I_D = 15 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	22	37	—	S	$I_D = 15 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	2800	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	240	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	140	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Q_g	—	50	—	nC	$V_{DD} = 50 \text{ V}$
Gate to source charge	Q_{gs}	—	9	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Q_{gd}	—	11	—	nC	$I_D = 30 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	23	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 15 \text{ A}$
Rise time	t_r	—	120	—	ns	$R_L = 2 \Omega$
Turn-off delay time	$t_{d(off)}$	—	70	—	ns	$R_g = 4.7 \Omega$
Fall time	t_f	—	9.5	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.9	—	V	$I_F = 30 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	47	—	ns	$I_F = 30 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Main Characteristics

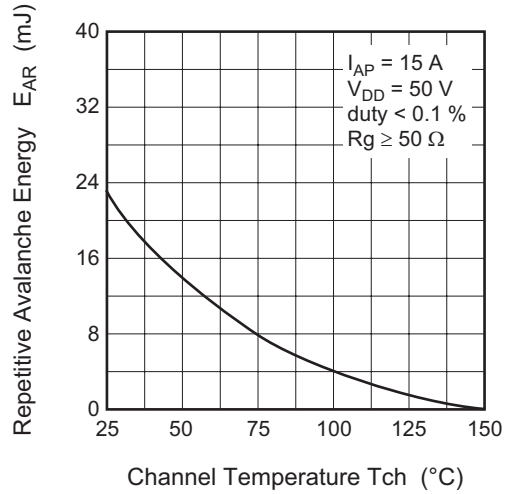




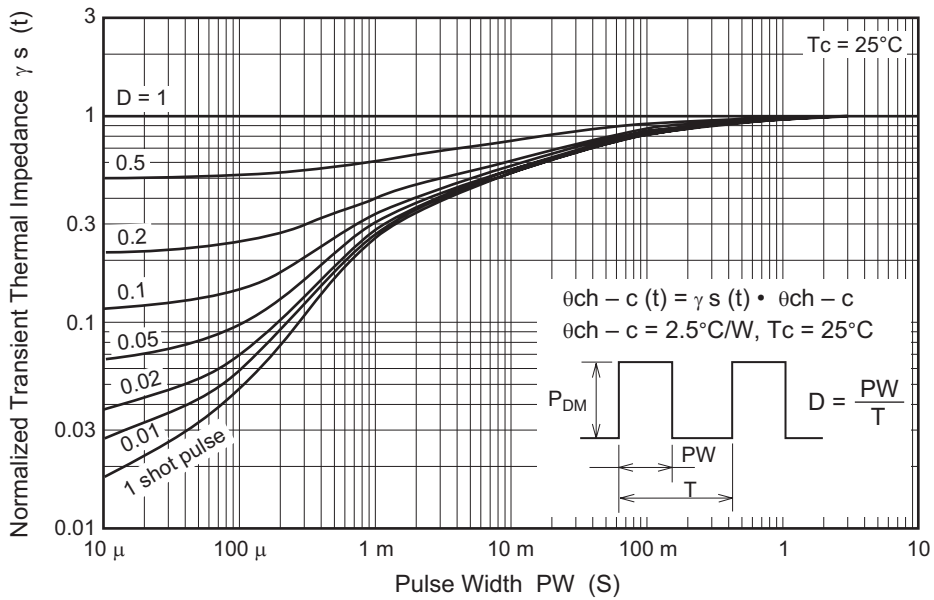
Reverse Drain Current vs. Source to Drain Voltage



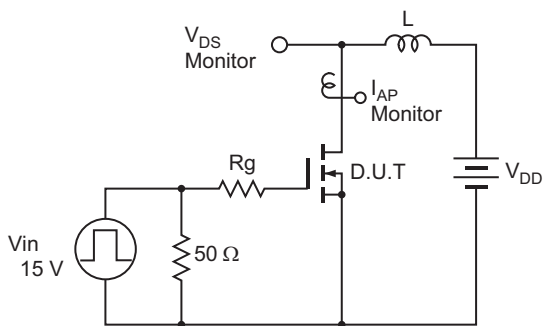
Maximum Avalanche Energy vs. Channel Temperature Derating



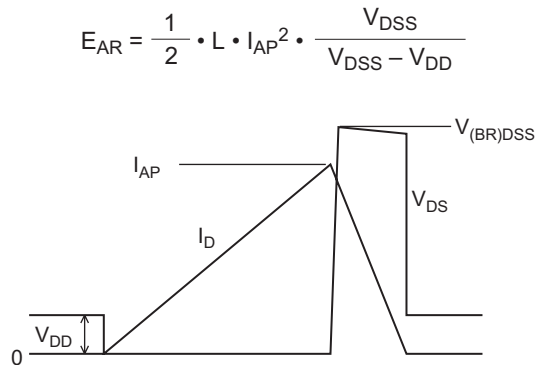
Normalized Transient Thermal Impedance vs. Pulse Width

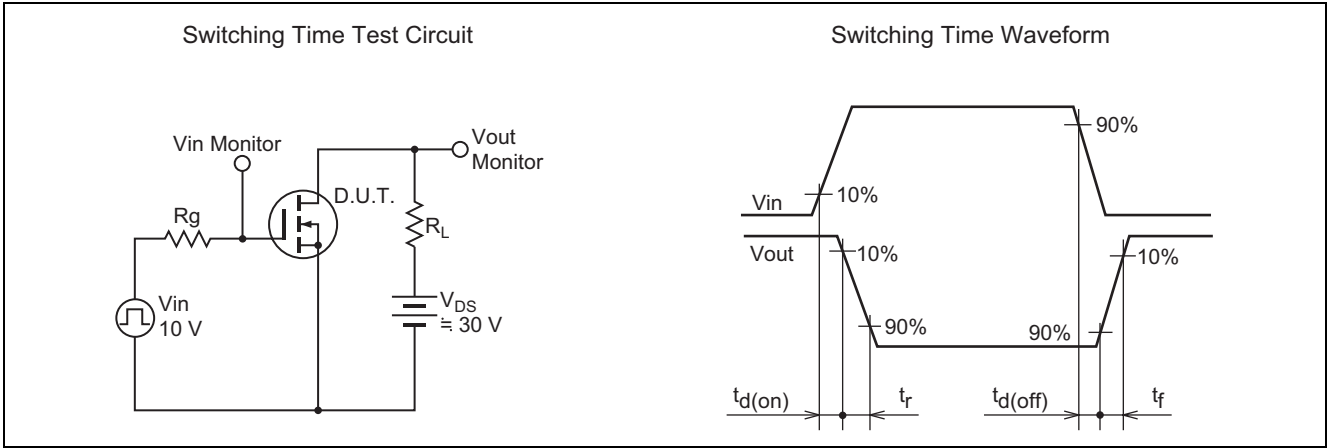


Avalanche Test Circuit



Avalanche Waveform

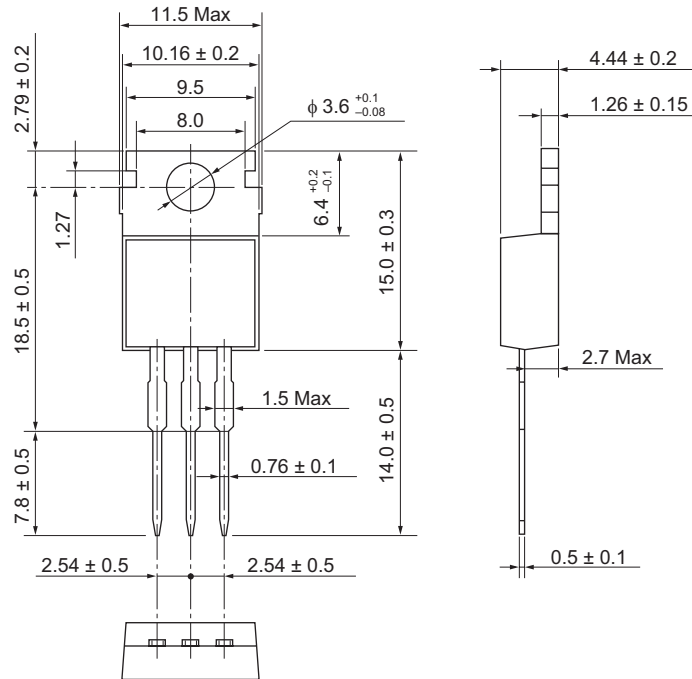




Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220AB	SC-46	PRSS0004AC-A	TO-220AB / TO-220ABV	1.8g

Unit: mm



Notes:

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