

HAT1047R, HAT1047RJ

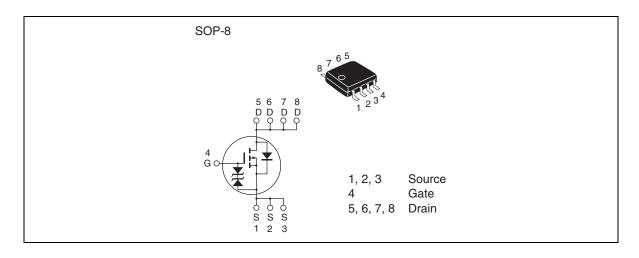
Silicon P Channel Power MOS FET High Speed Power Switching

REJ03G0074-0500Z (Previous ADE-208-1545D(Z)) Rev.5.00 Aug.27.2003

Features

- For Automotive Application (at Type Code "J")
- Low on-resistance
- Capable of -4.5 V gate drive
- High density mounting

Outline



Absolute Maximum Ratings

 $(Ta = 25^{\circ}C)$

Item		Symbol	Ratings	Unit
Drain to source voltage		V _{DSS}	-30	V
Gate to source voltage		V _{GSS}	±20	V
Drain current		I _D	-14	A
Drain peak current		I _{D(pulse)} Note1	-112	A
Body-drain diode reverse drain current		I _{DR}	-14	A
Avalanche current	HAT1047R	I _{AP} Note3	_	_
	HAT1047RJ	_	-14	A
Avalanche energy	HAT1047R	E _{AR} Note3	_	_
	HAT1047RJ	_	19.6	mJ
Channel dissipation		Pch Note2	2.5	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

Notes: 1. PW \leq 10 μ s, duty cycle \leq 1 %

^{2.} When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW \leq 10s

^{3.} Value at Tch = 25°C, Rg \geq 50 Ω

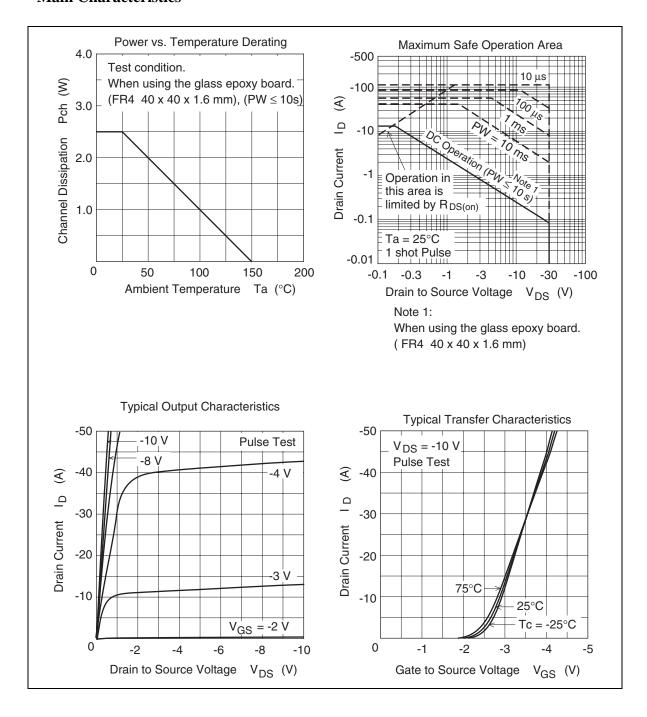
Electrical Characteristics

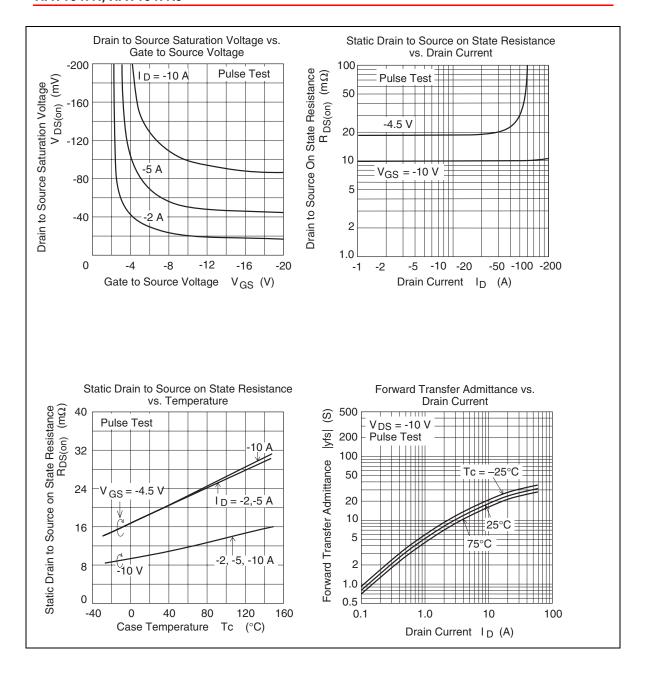
 $(Ta = 25^{\circ}C)$

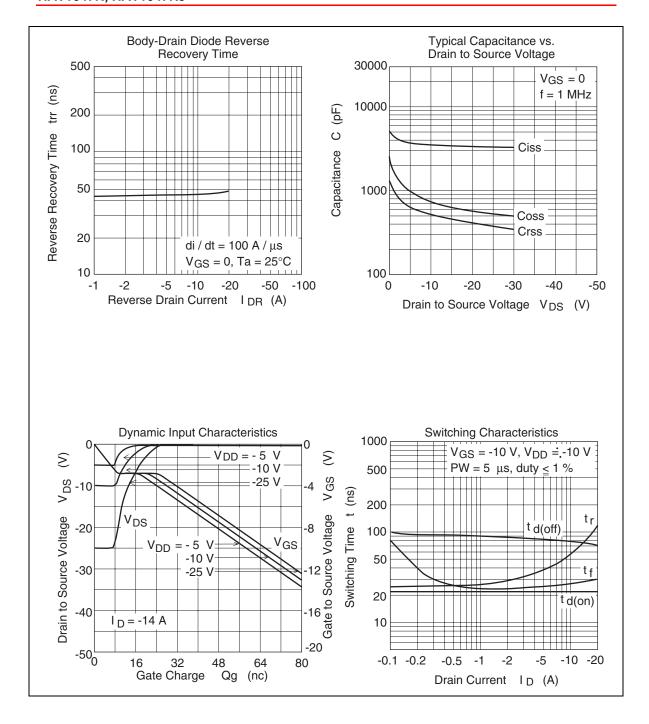
Item		Symbol	Min	Тур	Max	Unit	Test Conditions
Drain to source breakdown voltage		$V_{(BR)DSS}$	-30	_	_	V	$I_D = -10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage		$V_{(BR)GSS}$	±20	_	_	mV	$I_G = \pm 100 \ \mu A, \ V_{DS} = 0$
Gate to source leak current		I _{GSS}	_	_	±10	μΑ	$V_{GS} = \pm 16V, V_{DS} = 0$
Zero gate voltage drain current		I _{DSS}	_	_	±1	μΑ	$V_{DS} = -30 \text{ V}, V_{GS} = 0$
Zero gate voltage	HAT1047R	I _{DSS}	_	_	_	μΑ	V _{DS} = -24 V, V _{GS} = 0
drain current	HAT1047RJ	I _{DSS}	_	_	-20	μΑ	Ta = 125°C
Gate to source cutoff voltage		V _{GS(off)}	-1.0	_	-2.5	V	$V_{DS} = -10 \text{ V}, I_{D} = -1 \text{ mA}$
Static drain to source on state		R _{DS(on)}	_	10	12	mΩ	$I_D = -7 \text{ A}, V_{GS} = -10 \text{ V}^{\text{Note4}}$
resistance		R _{DS(on)}	_	19	25	mΩ	$I_D = -7 \text{ A}, V_{GS} = -4.5 \text{ V}^{\text{Note4}}$
Forward transfer admittance		y _{fs}	9.6	16	_	S	$I_D = -7 \text{ A}, V_{DS} = -10 \text{ V}^{\text{Note4}}$
Input capacitance		Ciss	_	3500	_	pF	V _{DS} = -10 V
Output capacitance		Coss	_	750	_	pF	$V_{GS} = 0$
Reverse transfer capacitance		Crss	_	520	_	pF	f = 1 MHz
Total gate charge		Qg	_	64	_	nc	V _{DD} = -10 V
Gate to source charge		Qgs	_	10	_	nc	$V_{GS} = -10 \text{ V}$
Gate to drain charge		Qgd	_	12	_	nc	$I_D = -14 \text{ A}$
Turn-on delay time		t _{d(on)}	_	23	_	ns	$V_{GS} = -10 \text{ V}, I_D = -7A$
Rise time		t _r	_	45	_	ns	$V_{DD} \cong -10 \text{ V}$
Turn-off delay time		t _{d(off)}	_	80	_	ns	$R_L = 1.43 \Omega$
Fall time		t _f	_	25	_	ns	$R_L = 4.7 \Omega$
Body-drain diode forward voltage		V_{DF}	_	-0.82	-1.07	V	$IF = -14 \text{ A}, V_{GS} = 0^{\text{Note4}}$
Body-drain diode reverse recovery time		t _{rr}	_	45	_	ns	IF = -14 A, $V_{GS} = 0$ diF/ dt = 100 A/ μ s

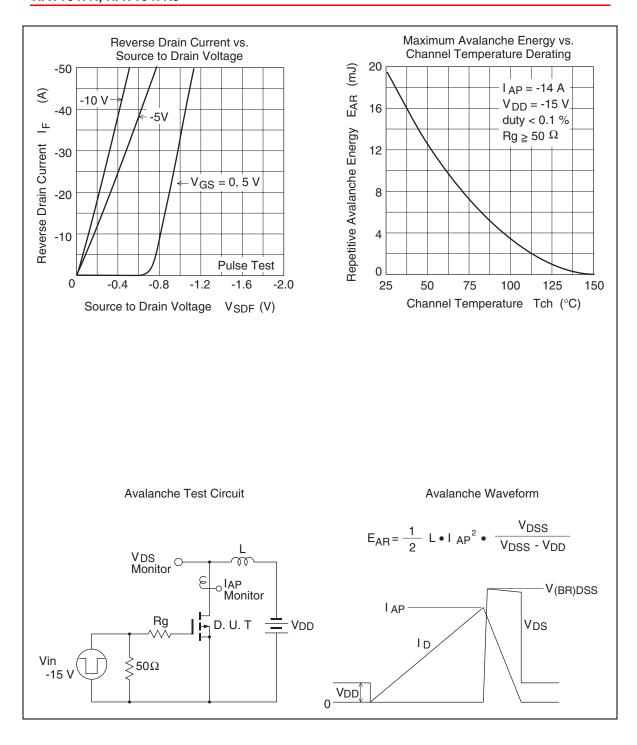
Notes: 4. Pulse test

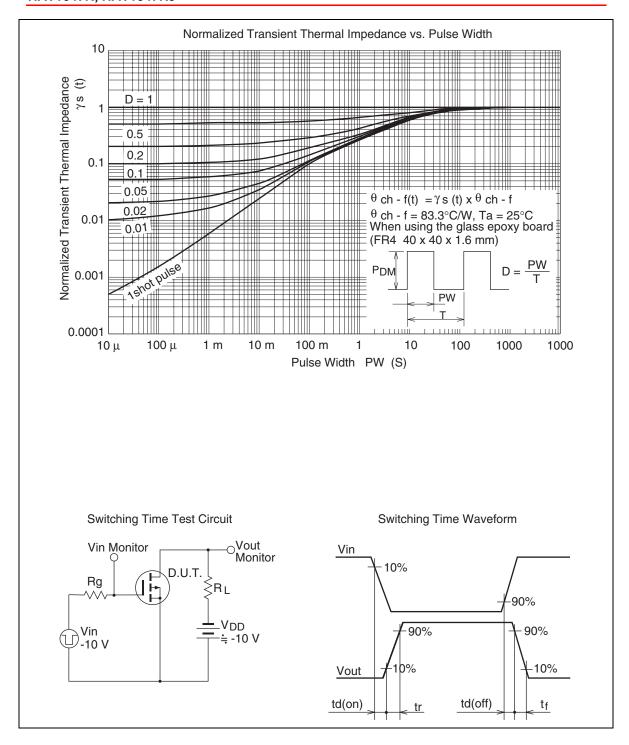
Main Characteristics



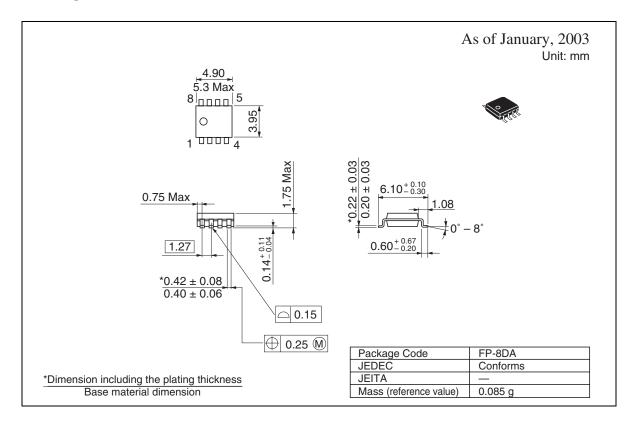








Package Dimensions



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Renesas Technology Singapore Pte. Ltd.
1, Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632 Tel: <65> 6213-0200, Fax: <65> 6278-8001