

HAT2019R

Silicon N Channel Power MOS FET
High Speed Power Switching

HITACHI

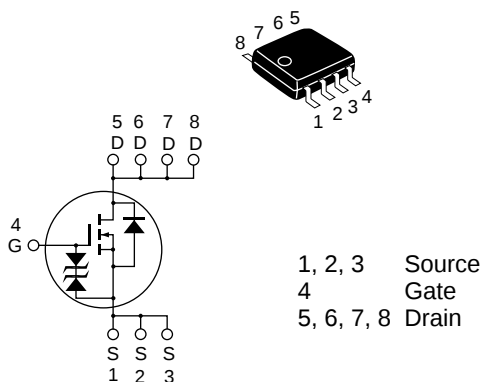
ADE-208-481 D (Z)
5th. Edition
February 1999

Features

- Low on-resistance
- Capable of 2.5 V gate drive
- Low drive current
- High density mounting

Outline

SOP-8



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	± 12	V
Drain current	I_D	8	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	64	A
Body-drain diode reverse drain current	I_{DR}	8	A
Channel dissipation	P_{ch} ^{Note2}	2.5	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	- 55 to + 150	°C

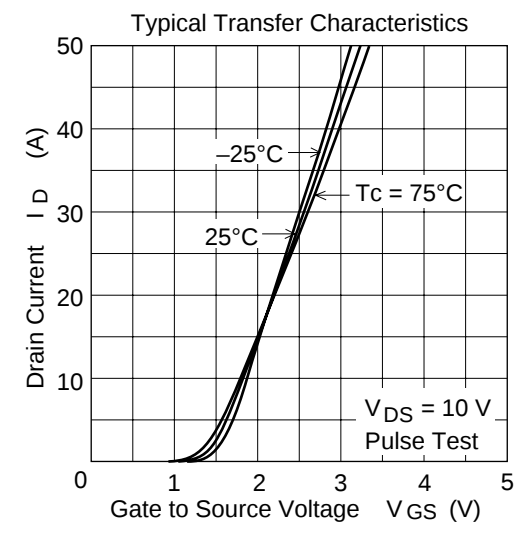
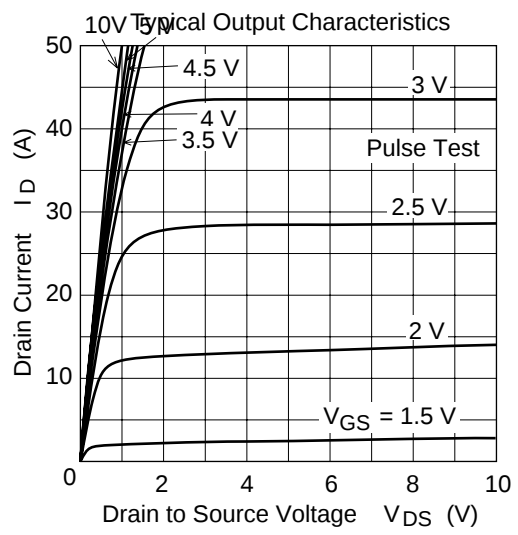
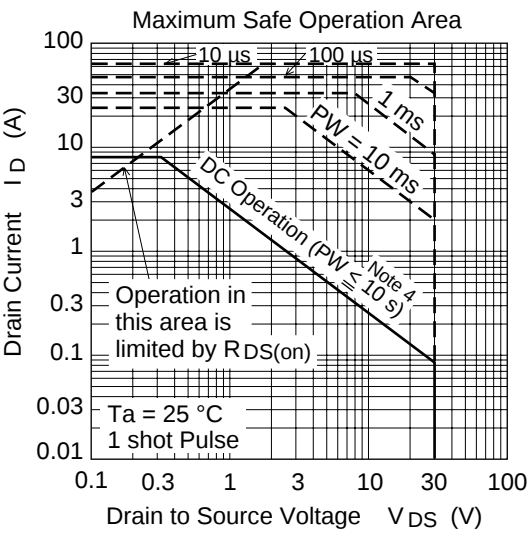
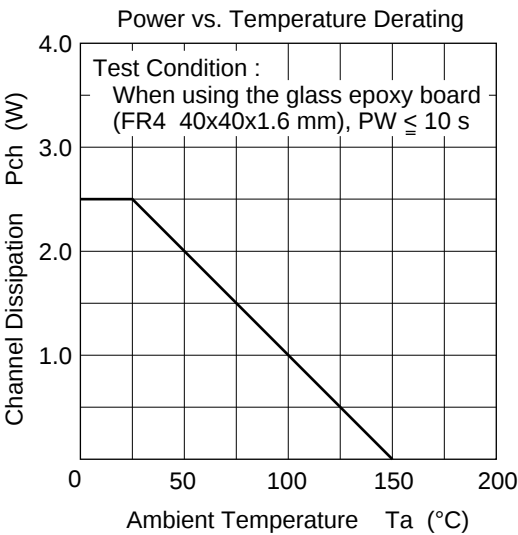
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
2. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

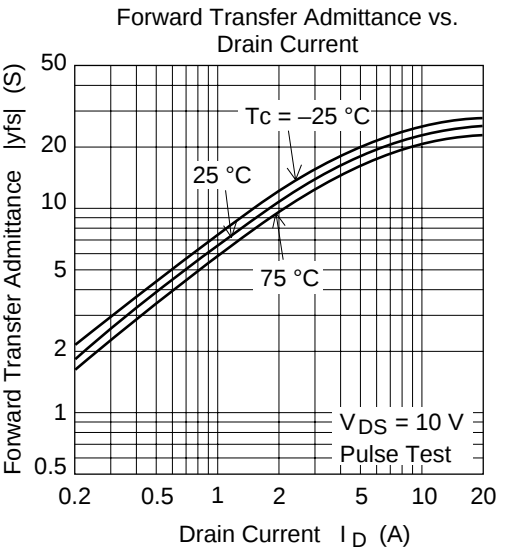
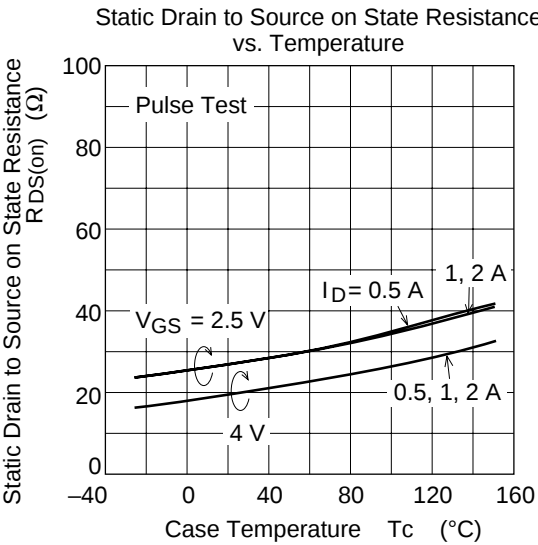
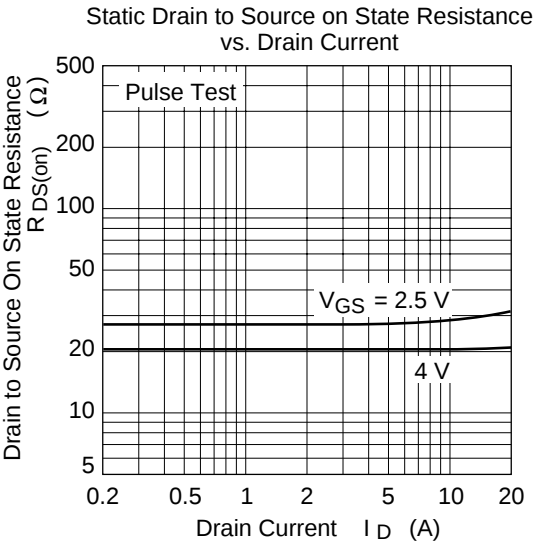
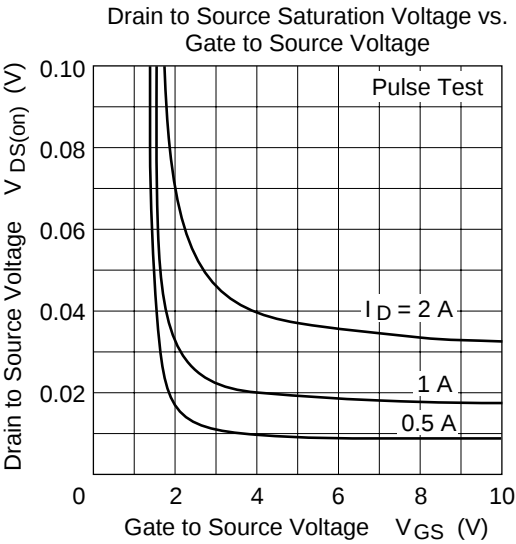
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	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	$V_{(BR)GSS}$	± 12	—	—	V	$I_G = \pm 100\text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 10\text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 30\text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.020	0.027	Ω	$I_D = 4\text{ A}$, $V_{GS} = 4\text{ V}$ ^{Note3}
	$R_{DS(on)}$	—	0.027	0.037	Ω	$I_D = 4\text{ A}$, $V_{GS} = 2.5\text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	10	16	—	S	$I_D = 4\text{ A}$, $V_{DS} = 10\text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	920	—	pF	$V_{DS} = 10\text{ V}$
Output capacitance	C_{oss}	—	550	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	225	—	pF	$f = 1\text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{GS} = 4\text{ V}$, $I_D = 4\text{ A}$
Rise time	t_r	—	180	—	ns	$V_{DD} \cong 10\text{ V}$
Turn-off delay time	$t_{d(off)}$	—	165	—	ns	
Fall time	t_f	—	185	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.8	1.3	V	$IF = 8\text{ A}$, $V_{GS} = 0$ ^{Note3}
Body–drain diode reverse recovery time	t_{rr}	—	60	—	ns	$IF = 8\text{ A}$, $V_{GS} = 0$ $diF/dt = 20\text{ A}/\mu s$

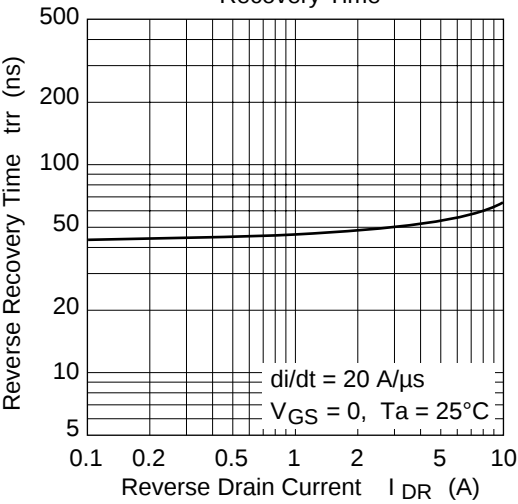
Note: 3. Pulse test

Main Characteristics

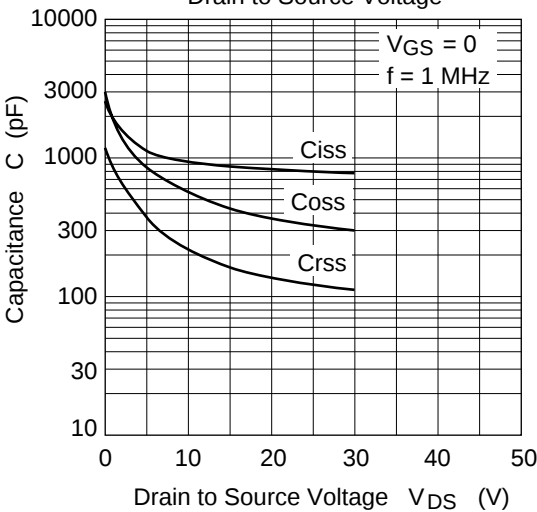




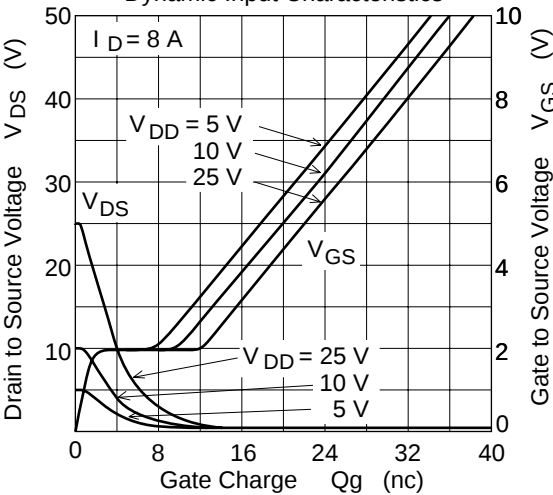
Body-Drain Diode Reverse Recovery Time



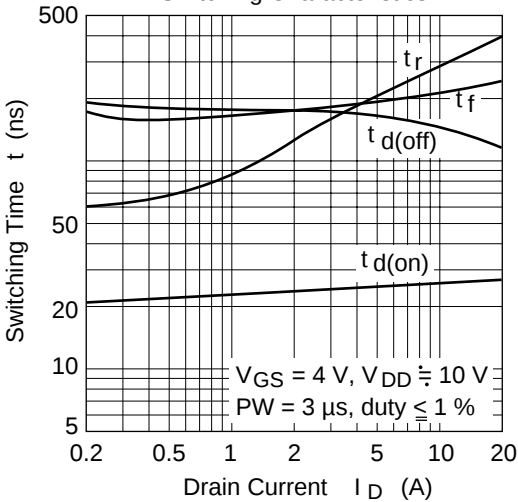
Typical Capacitance vs. Drain to Source Voltage

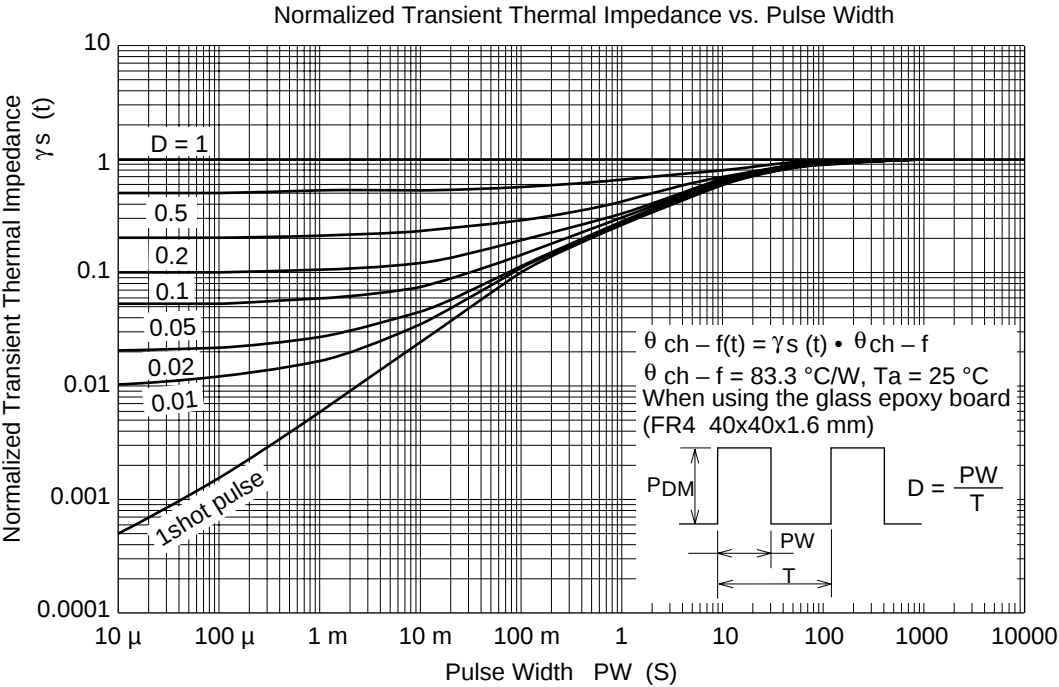
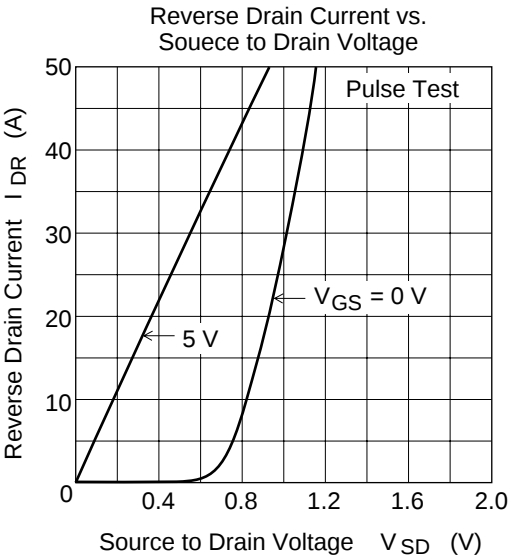


Dynamic Input Characteristics

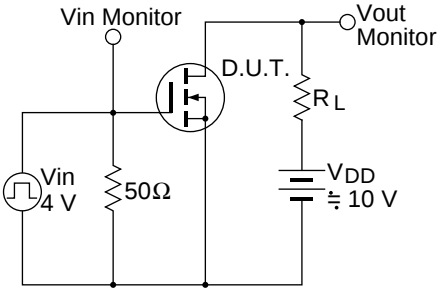


Switching Characteristics

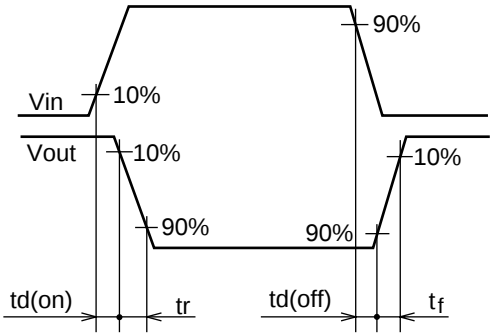




Switching Time Test Circuit

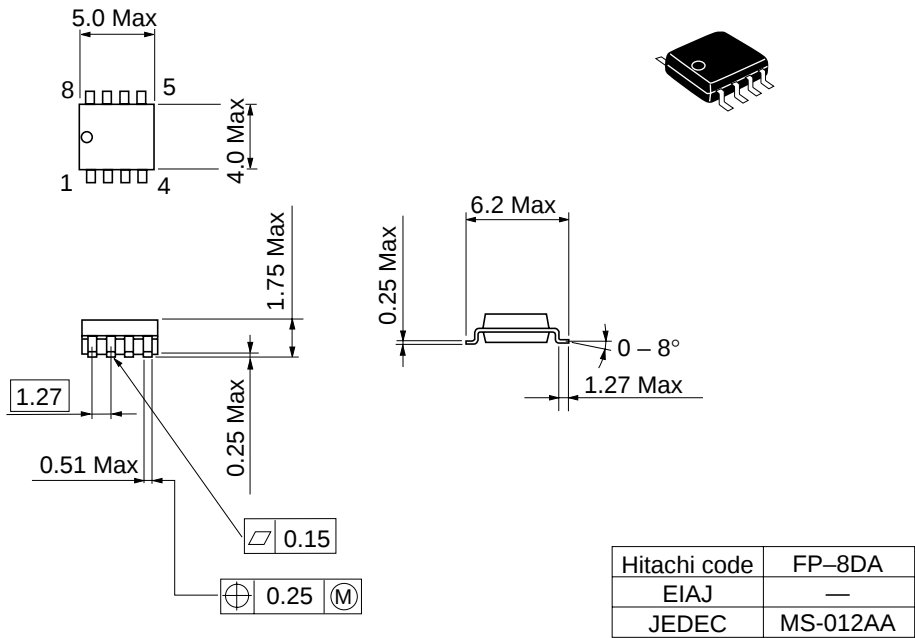


Switching Time Waveform



Package Dimensions

Unit: mm



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