HAT1023R

Silicon P Channel Power MOS FET
High Speed Power Switching

HITACHI

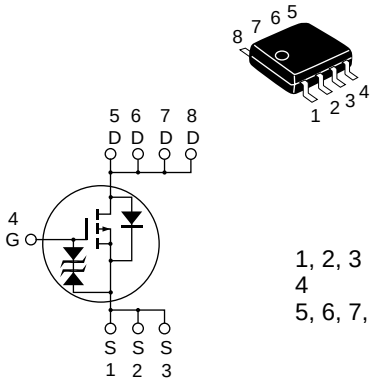
ADE-208-436 F (Z)
7th. Edition
October. 1996

Features

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

Outline

SOP–8



1, 2, 3	Source
4	Gate
5, 6, 7, 8	Drain

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	VDSS	–20	V
Gate to source voltage	VGSS	±10	V
Drain current	ID	–7	A
Drain peak current	ID(pulse)Note1	–56	A
Body–drain diode reverse drain current	IDR	–7	A
Channel dissipation	Pch Note2	2.5	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

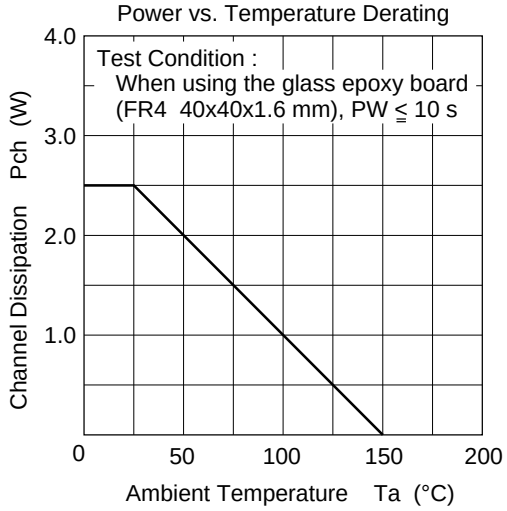
Note: 1. PW ≤ 10µs, duty cycle ≤ 1 %
2. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW≤ 10s

Electrical Characteristics (Ta = 25°C)

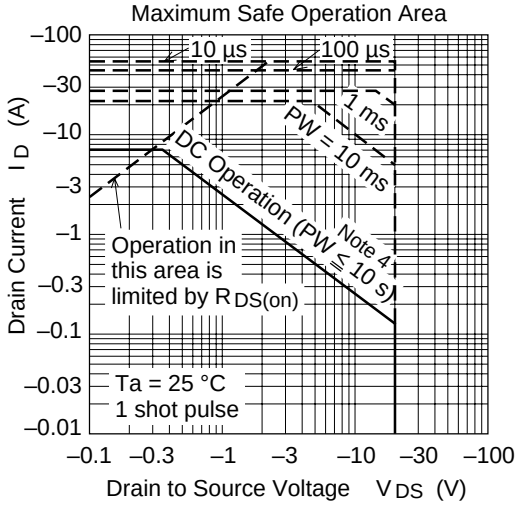
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V(BR)DSS	–20	—	—	V	ID = –10mA, VGS = 0
Gate to source breakdown voltage	V(BR)GSS	±10	—	—	V	IG = ±100µA, VDS = 0
Gate to source leak current	IGSS	—	—	±10	µA	VGS = ±8V, VDS = 0
Zero gate voltege drain current	IDSS	—	—	–10	µA	VDS = –20 V, VGS = 0
Gate to source cutoff voltage	VGS(off)	–0.5	—	–1.5	V	VDS = –10V, I D = –1mA
Static drain to source on state	RDS(on)	—	0.027	0.04	Ω	ID = –4A, VGS = –4V Note3
resistance	RDS(on)	—	0.04	0.06	Ω	ID = –4A, VGS = –2.5V Note3
Forward transfer admittance	|yfs|	9	14	—	S	ID = –4A, VDS = –10V Note3
Input capacitance	Ciss	—	2250	—	pF	VDS = –10V
Output capacitance	Coss	—	1120	—	pF	VGS = 0
Reverse transfer capacitance	Crss	—	300	—	pF	f = 1MHz
Turn-on delay time	td(on)	—	40	—	ns	VGS = –4V, ID = –4A
Rise time	tr	—	200	—	ns	VDD Å‡ –10V
Turn-off delay time	td(off)	—	280	—	ns	
Fall time	tf	—	220	—	ns	
Body–drain diode forward voltage	VDF	—	–0.9	–1.4	V	IF = –7A, VGS = 0 Note3
Body–drain diode reverse recovery time	trr	—	75	—	ns	IF = –7A, VGS = 0 diF/ dt =20A/µs

Main Characteristics

Power vs. Temperature Derating

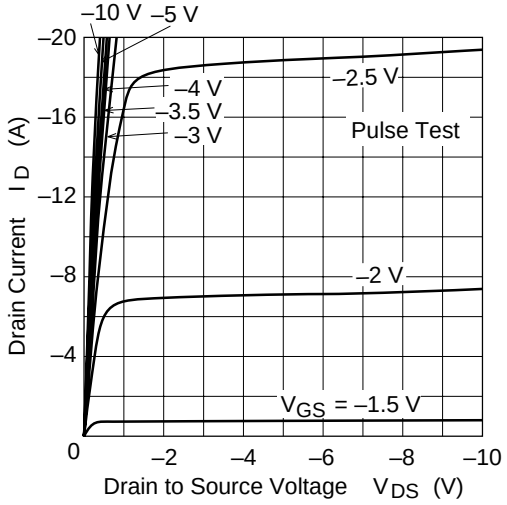


Maximum Safe Operation Area

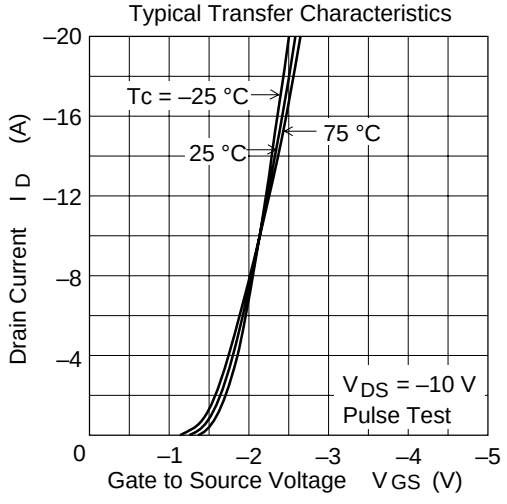


Note 4 :
When using the glass epoxy board
(FR4 40 x 40 x 1.6 mm)

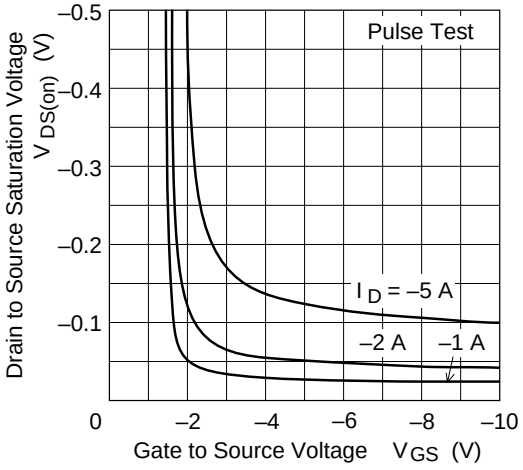
Typical Output Characteristics



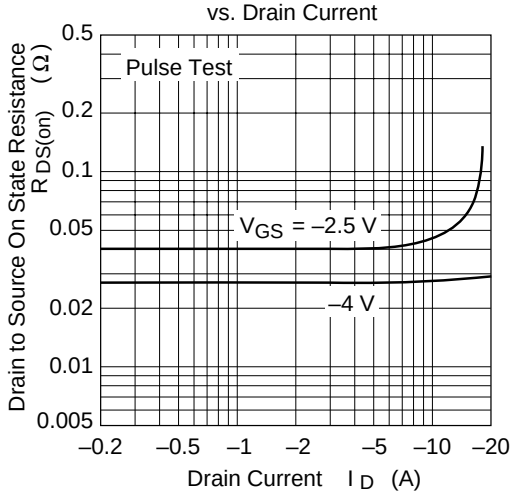
Typical Transfer Characteristics



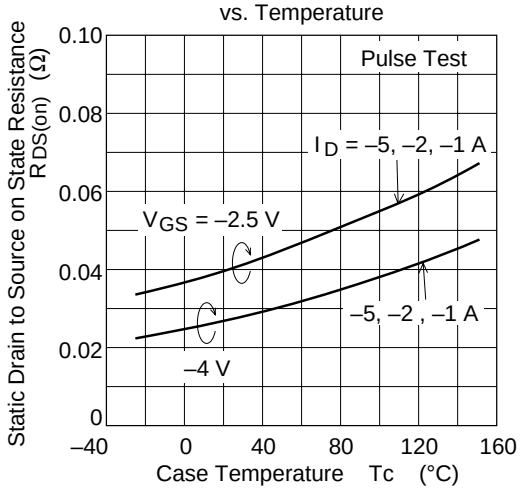
Drain to Source Saturation Voltage vs. Gate to Source Voltage



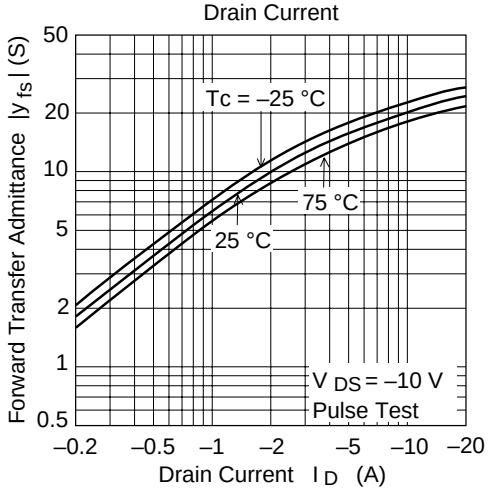
Static Drain to Source on State Resistance vs. Drain Current



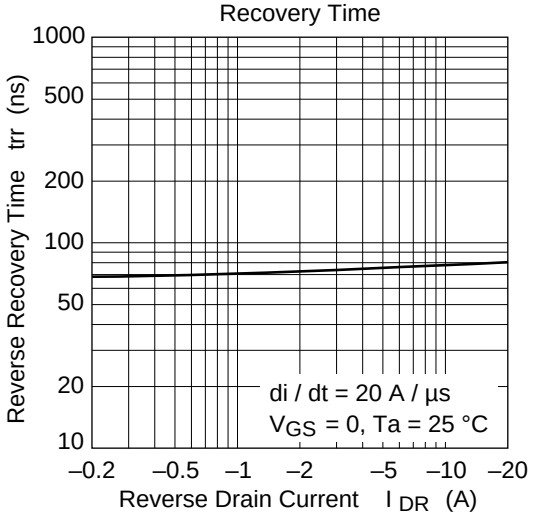
Static Drain to Source on State Resistance vs. Temperature



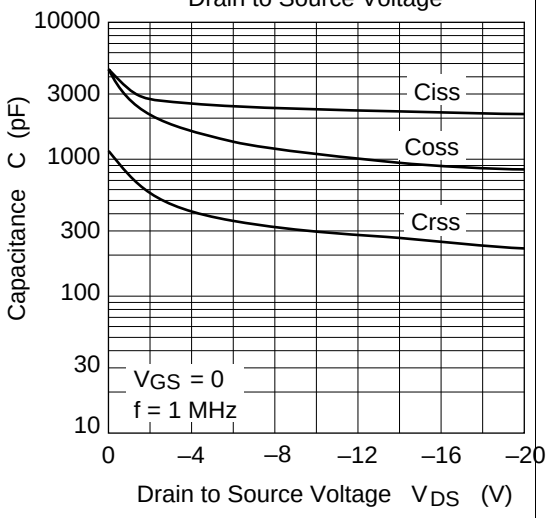
Forward Transfer Admittance vs. Drain Current



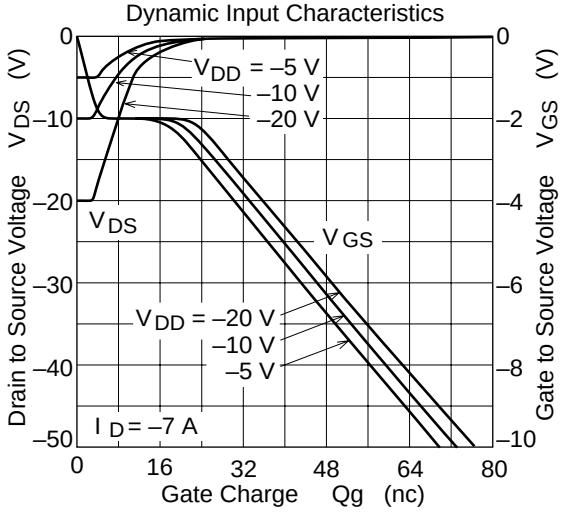
Body–Drain Diode Reverse Recovery Time



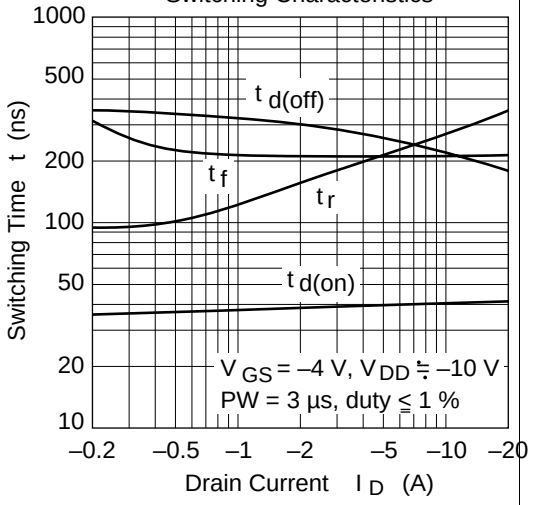
Typical Capacitance vs. Drain to Source Voltage

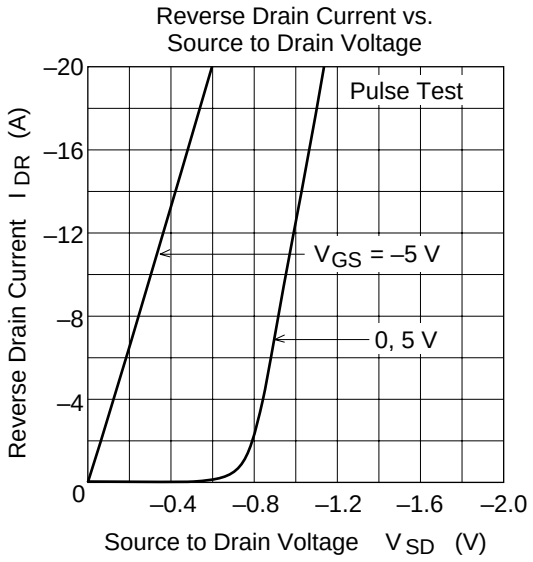


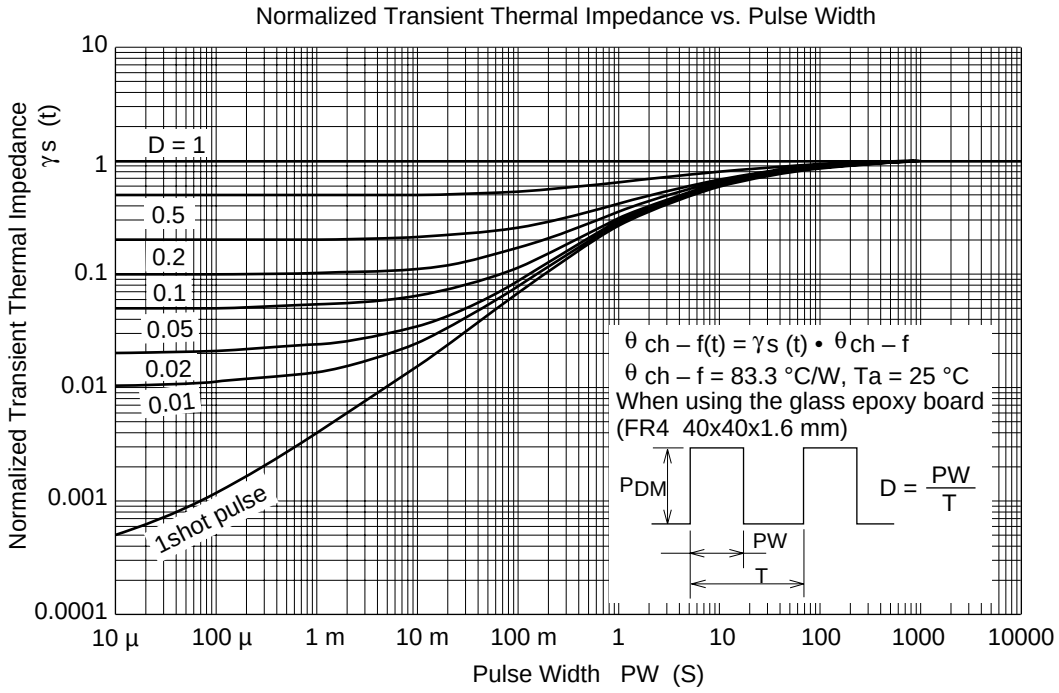
Dynamic Input Characteristics



Switching Characteristics



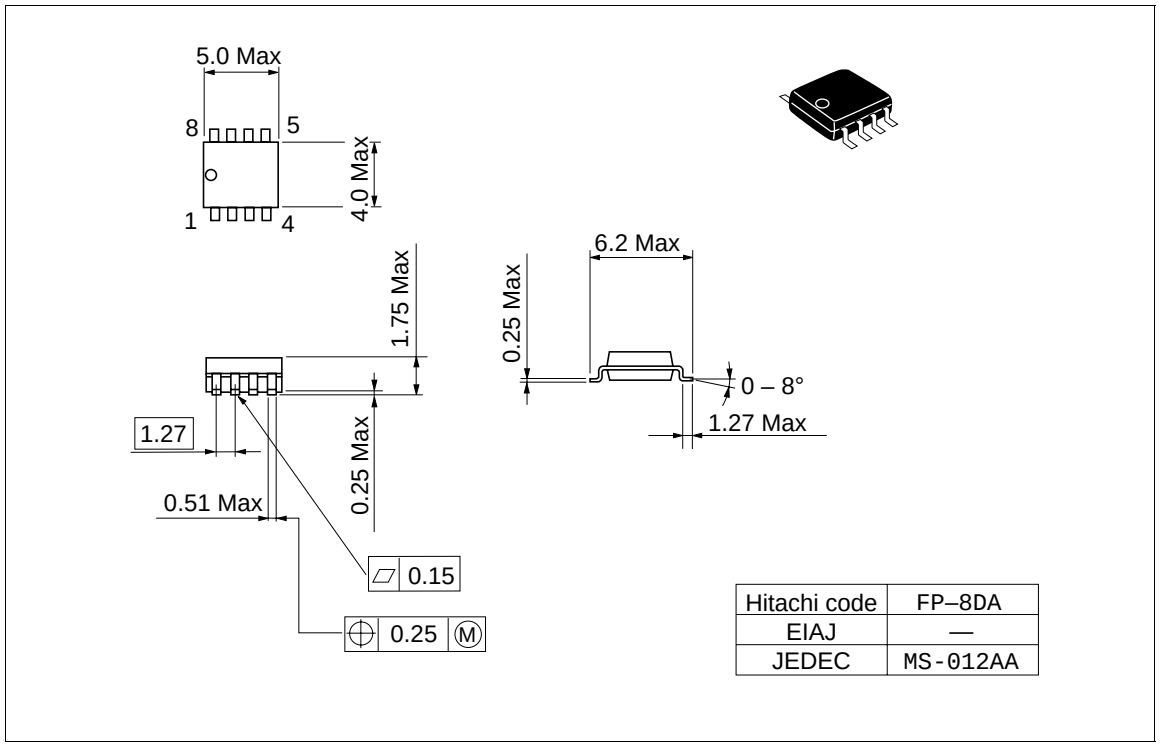

Reverse Drain Current vs.
Source to Drain Voltage
Pulse Test
VGS = –5 V
0, 5 V
Reverse Drain Current IDR (A)
Source to Drain Voltage VSD (V)
–20
–16
–12
–8
–4
0
–0.4
–0.8
–1.2
–1.6
–2.0


Normalized Transient Thermal Impedance vs. Pulse Width
Normalized Transient Thermal Impedance γs (t)
Pulse Width PW (S)
D = 1
0.5
0.2
0.1
0.05
0.02
0.01
1shot pulse
θ ch – f(t) = γs (t) • θ ch – f
θ ch – f = 83.3 °C/W, Ta = 25 °C
When using the glass epoxy board
(FR4 40x40x1.6 mm)
PDM
D = PW/T
PW
T
10
1
0.1
0.01
0.001
0.0001
10 µ
100 µ
1 m
10 m
100 m
1
10
100
1000
10000

HAT1023R

Package Dimentions

Unit: mm



Hitachi code	FP–8DA
EIAJ	—
JEDEC	MS-012AA