HAT2008F

Silicon N Channel Power MOS FET

Application

Power switching

Features

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

Ordering Information

Hitachi Cord	FP–8D
EIAJ Cord	SC–527–8A
JEDEC Cord	—

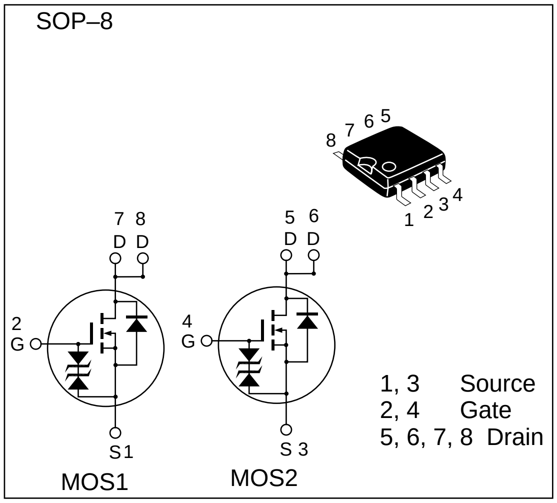


Table 1 Absolute Maximum Ratings (Ta = 25°C)

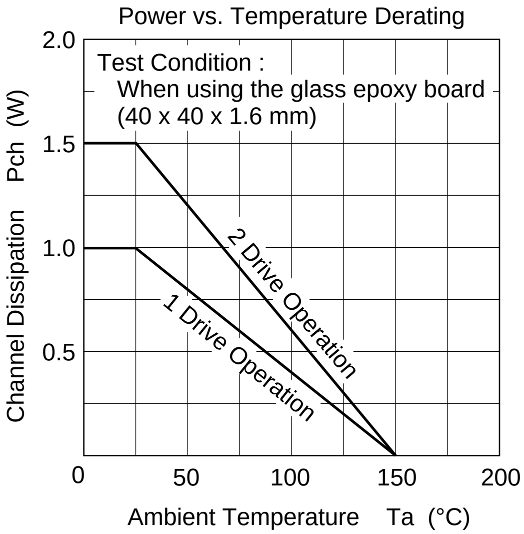
Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	20	V
Gate to source voltage	V_{GSS}	±10	V
Drain current	I_D	3.5	A
Drain peak current	$I_{D(pulse)}{}^{*}$	14	A
Channel dissipation	Pch***	1.5	W
Channel dissipation	Pch**	1	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

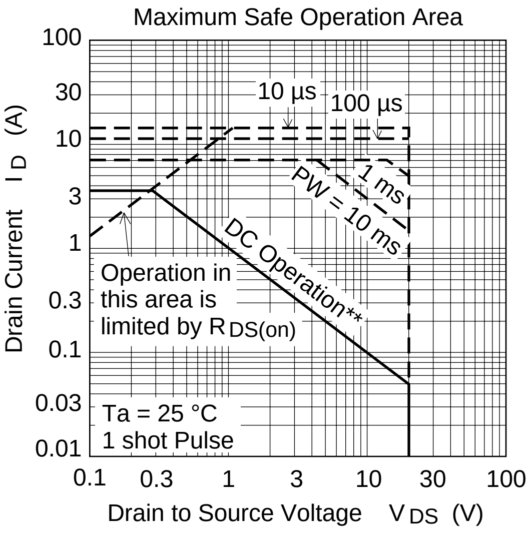
* PW ≤ 10 µs, duty cycle ≤ 1 %
** 1 Drive operation When using the glass epoxy board (40 x 40 x 1.6 mm)
*** 2 Drive operation When using the glass epoxy board (40 x 40 x 1.6 mm)

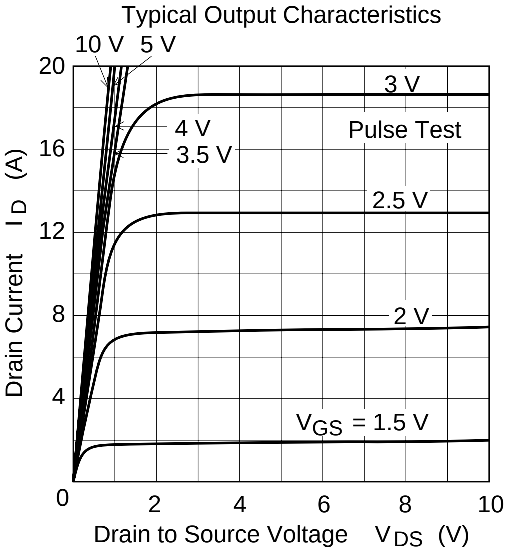
Table 2 Electrical Characteristics (Ta = 25°C)

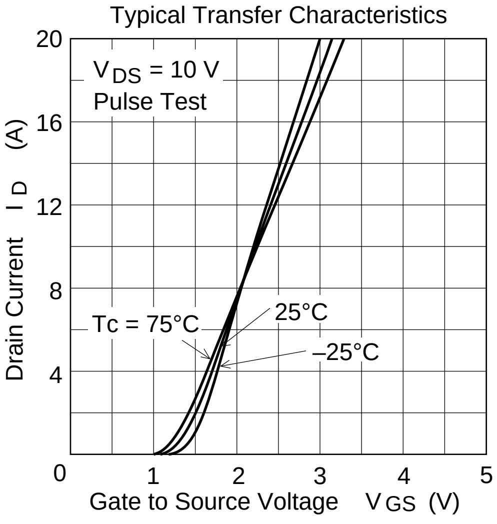
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	I_G = ±200 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±6.5 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 20 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	0.055	0.075	Ω	I_D = 2A V_{GS} = 4V *
		—	0.07	0.11	Ω	I_D = 2A V_{GS} =2.5V *
Forward tramsfer admittance	$\|y_{fs}\|$	5.0	7.5	—	S	I_D = 2 A V_{DS} = 10 V *
Input capacitance	Ciss	—	620	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	420	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	140	—	pF	f = 1 MHz
Turn–on delay time	$t_{d(on)}$	—	18	—	ns	V_{GS} = 4 V, I_D = 2 A
Rise time	t_r	—	85	—	ns	V_{DD} = 10 V
Turn–off delay time	$t_{d(off)}$	—	110	—	ns	
Fall time	t_f	—	100	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.9	—	V	I_F = 3.5 A, V_{GS} = 0
Body–drain diode reverse recovery time	trr	—	45	—	ns	I_F = 3.5 A diF / dt = 20A / µs

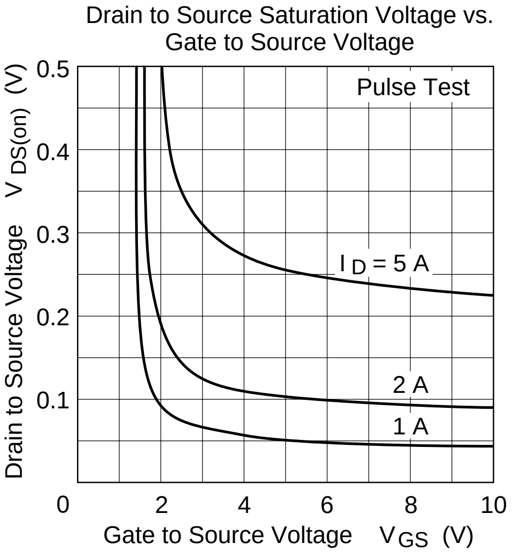
* Pulse Test

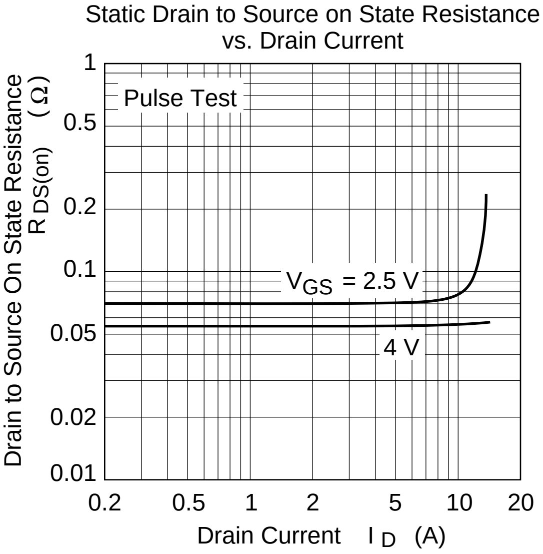

Power vs. Temperature Derating
Test Condition :
When using the glass epoxy board
(40 x 40 x 1.6 mm)
2 Drive Operation
1 Drive Operation
Channel Dissipation Pch (W)
2.0
1.5
1.0
0.5
0
50
100
150
200
Ambient Temperature Ta (°C)

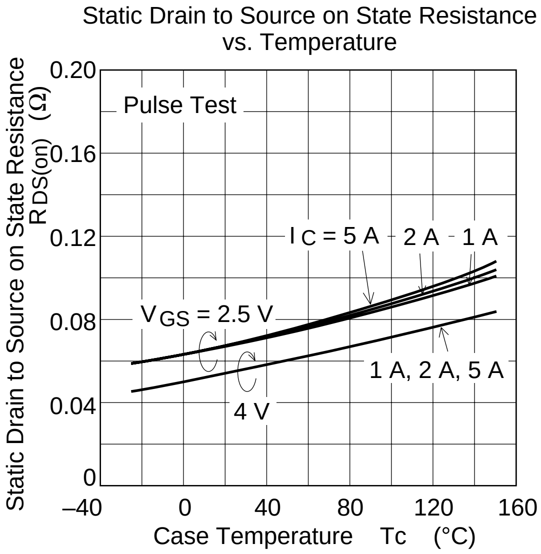

Maximum Safe Operation Area
10 μs
100 μs
1 ms
PW = 10 ms
DC Operation**
Operation in this area is limited by R DS(on)
Ta = 25 °C
1 shot Pulse
Drain Current I D (A)
100
30
10
3
1
0.3
0.1
0.03
0.01
0.1
0.3
1
3
10
30
100
Drain to Source Voltage V DS (V)

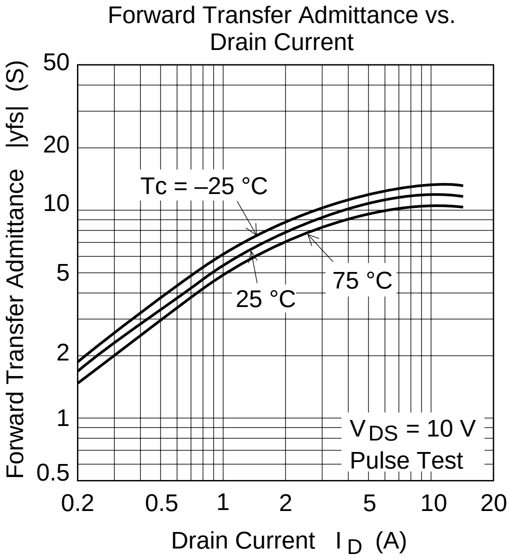

Typical Output Characteristics
10 V
5 V
3 V
4 V
3.5 V
Pulse Test
2.5 V
2 V
VGS = 1.5 V
Drain Current I D (A)
20
16
12
8
4
0
2
4
6
8
10
Drain to Source Voltage V DS (V)

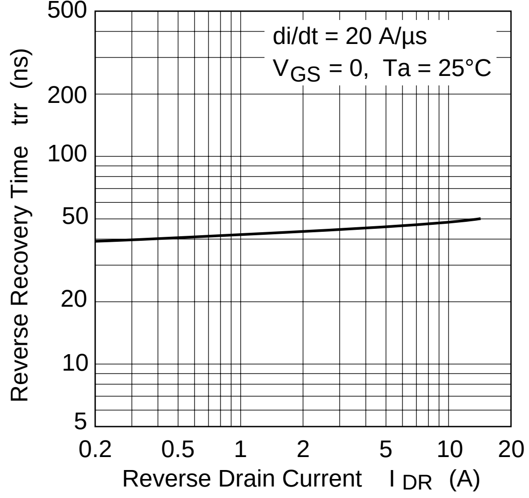

Typical Transfer Characteristics
V DS = 10 V
Pulse Test
Tc = 75°C
25°C
–25°C
Drain Current I D (A)
20
16
12
8
4
0
1
2
3
4
5
Gate to Source Voltage V GS (V)


Drain to Source Saturation Voltage vs.
Gate to Source Voltage
Pulse Test
I D = 5 A
2 A
1 A
Drain to Source Voltage V DS(on) (V)
0.5
0.4
0.3
0.2
0.1
0
2
4
6
8
10
Gate to Source Voltage V GS (V)

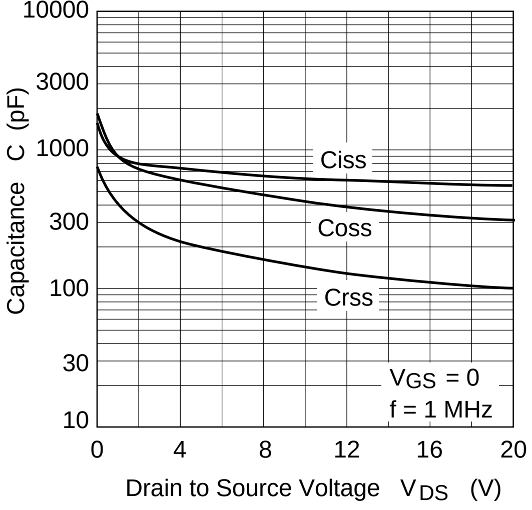

Static Drain to Source on State Resistance
vs. Drain Current
Pulse Test
VGS = 2.5 V
4 V
Drain to Source On State Resistance R DS(on) (Ω)
1
0.5
0.2
0.1
0.05
0.02
0.01
0.2
0.5
1
2
5
10
20
Drain Current I D (A)


Static Drain to Source on State Resistance
vs. Temperature
Pulse Test
I C = 5 A
2 A
1 A
VGS = 2.5 V
4 V
1 A, 2 A, 5 A
Static Drain to Source on State Resistance R DS(on) (Ω)
0.20
0.16
0.12
0.08
0.04
0
–40
0
40
80
120
160
Case Temperature Tc (°C)

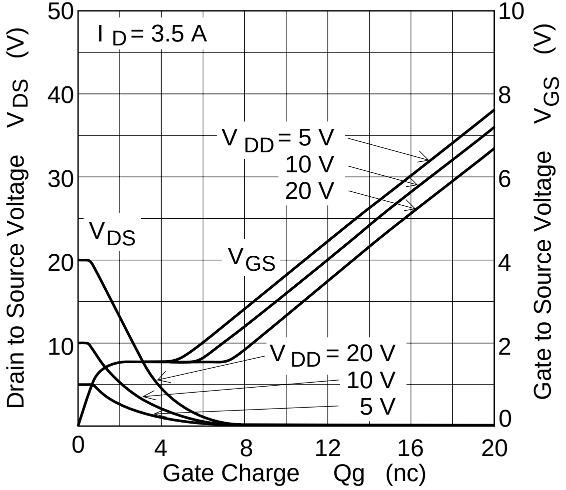

Forward Transfer Admittance vs.
Drain Current
Tc = –25 °C
25 °C
75 °C
VDS = 10 V
Pulse Test
Forward Transfer Admittance |yfs| (S)
50
20
10
5
2
1
0.5
0.2
0.5
1
2
5
10
20
Drain Current I D (A)



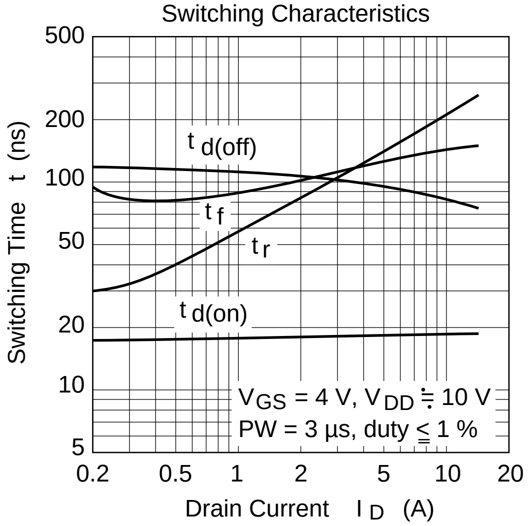
Body–Drain Diode Reverse Recovery Time



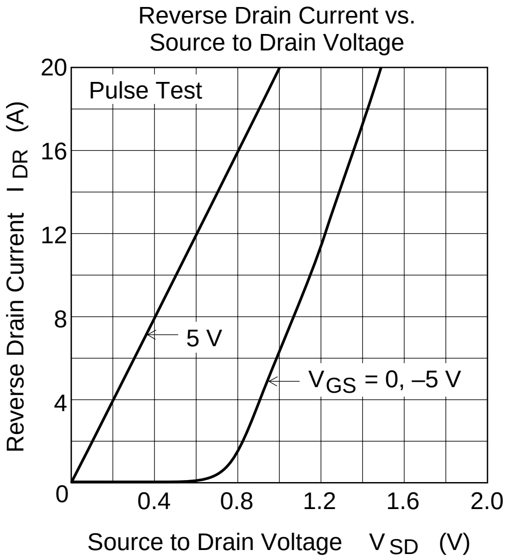
Typical Capacitance vs. Drain to Source Voltage



Dynamic Input Characteristics

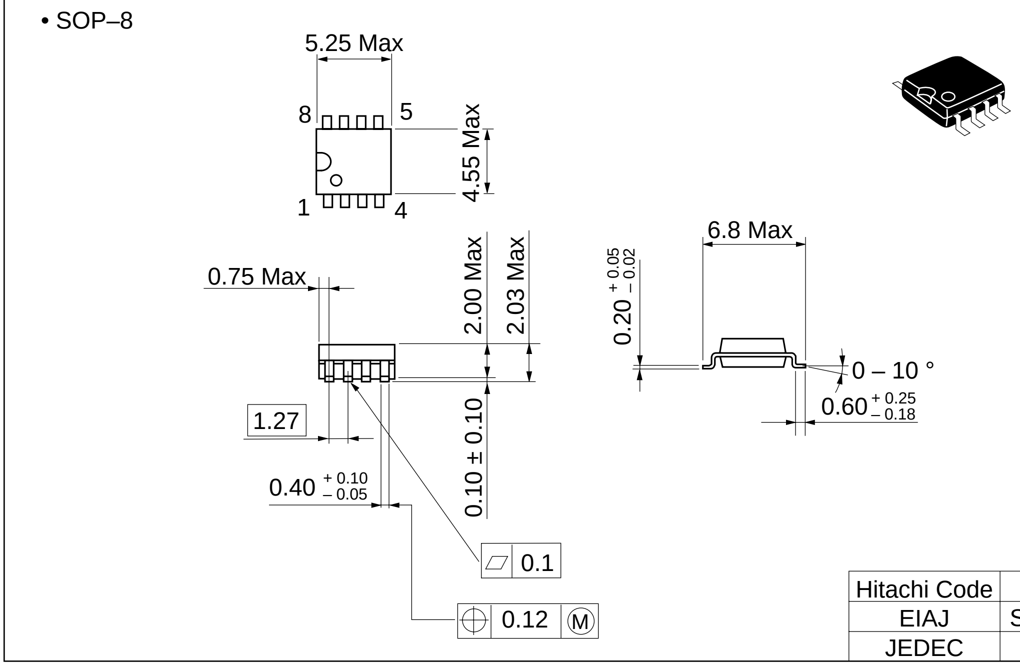


Switching Characteristics



Package Dimensions

Unit : mm



Hitachi Code	FP–8D
EIAJ	SC–527–8A
JEDEC	—