To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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HAT2126RP

Silicon N Channel Power MOS FET with Schottky Barrier Diode
High Speed Power Switching

RENESAS

ADE-208-1576D (Z)

5th. Edition
Dec. 2002

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Features

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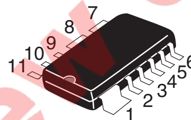
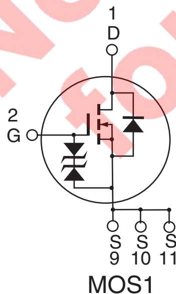
- Low on-resistance
- Capable of 4.5 V gate drive
- High density mounting
- Built-in Schottky Barrier Diode

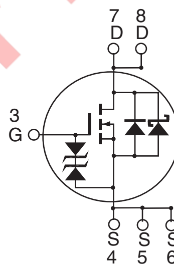
Outline

HSOP-11





MOS1



MOS2 and
Schottky Barrier Diode

4, 5, 6, 9, 10 , 11	Source
2, 3	Gate
1, 7, 8	Drain

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Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings		Unit
		MOS1	MOS2 & SBD	
Drain to source voltage	V_{DSS}	30	30	V
Gate to source voltage	V_{GSS}	±20	±12	V
Drain current	I_D	12	16	A
Drain peak current	$I_{D(pulse)}$ Note1	96	128	A
Reverse drain current	I_{DR}	12	16	A
Channel dissipation	Pch Note2	2.0	3.5	W
Channel temperature	Tch	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

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

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Electrical Characteristics

(Ta = 25°C)

• **MOS1**

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	I_D = 10mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 30V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	V_{DS} = 10V, I_D = 1mA
Static drain to source on state resistance	$R_{DS(on)}$	—	10	13	mΩ	I_D = 6A, V_{GS} = 10V [Note3]
	$R_{DS(on)}$	—	18	27	mΩ	I_D = 6A, V_{GS} = 4.5V [Note3]
Forward transfer admittance	$\|y_{fs}\|$	12	20	—	S	I_D = 6A, V_{DS} = 10V [Note3]
Input capacitance	Ciss	—	1000	—	pF	V_{DS} = 10V
Output capacitance	Coss	—	280	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	160	—	pF	f = 1MHz
Total gate charge	Qg	—	9	—	nc	V_{DD} = 10 V
Gate to source charge	Qgs	—	3.6	—	nc	V_{GS} = 5 V
Gate to drain charge	Qgd	—	3.2	—	nc	I_D = 16 A
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	V_{GS} =10V, I_D = 6A
Rise time	t_r	—	22	—	ns	V_{DD} ≈ 10V
Turn-off delay time	$t_{d(off)}$	—	55	—	ns	R_L = 1.67Ω
Fall time	t_f	—	9	—	ns	R_g = 4.7Ω
Body–drain diode forward voltage	V_{DF}	—	0.82	1.07	V	IF = 12A, V_{GS} = 0 [Note3]
Body–drain diode reverse recovery time	t_{rr}	—	25	—	ns	IF =12A, V_{GS} = 0 diF/ dt =50A/µs

Notes: 3. Pulse test

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• **MOS2 & Schottky Barrier Diode**

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	I_D = 10mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±12	—	—	V	I_G = ±100µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±10V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	m A	V_{DS} = 30V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.4	—	2.5	V	V_{DS} = 10V, I_D =1mA
Static drain to source on state resistance	$R_{DS(on)}$	—	5.6	7.3	mΩ	I_D = 8A, V_{GS} = 10V Note3
	$R_{DS(on)}$	—	7.3	9.5	mΩ	I_D = 8A, V_{GS} = 4.5V Note3
Forward transfer admittance	$\|y_{fs}\|$	25	41	—	S	I_D = 8A, V_{DS} = 10V Note3
Input capacitance	Ciss	—	3800	—	pF	V_{DS} = 10V
Output capacitance	Coss	—	745	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	300	—	pF	f = 1MHz
Total gate charge	Qg	—	34	—	nc	V_{DD} = 10 V
Gate to source charge	Qgs	—	10	—	nc	V_{GS} = 5 V
Gate to drain charge	Qgd	—	8	—	nc	I_D = 16 A
Turn-on delay time	$t_{d(on)}$	—	18	—	ns	V_{GS} = 10V, I_D = 8A
Rise time	t_r	—	22	—	ns	V_{DD} ≈ 10V
Turn-off delay time	$t_{d(off)}$	—	88	—	ns	R_L = 1.25Ω
Fall time	t_f	—	9.0	—	ns	R_g = 4.7Ω
Schottky Barrier diode forward voltage	V_F	—	0.5	—	V	IF = 3.5A, V_{GS} = 0 Note3
Body–drain diode reverse recovery time	t_{rr}	—	35	—	ns	IF = 16A, V_{GS} = 0 diF/ dt =50A/µs

Notes: 3. Pulse test

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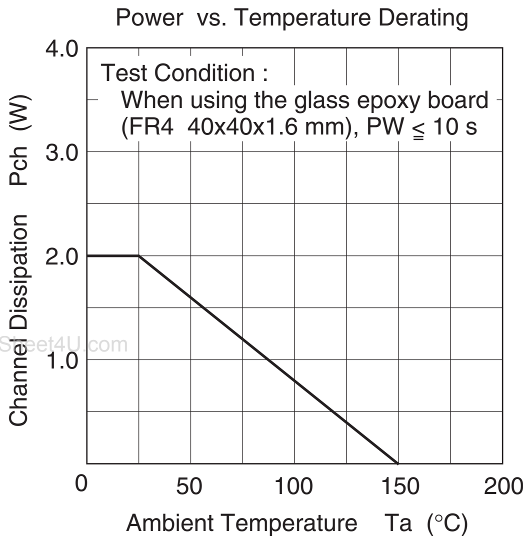
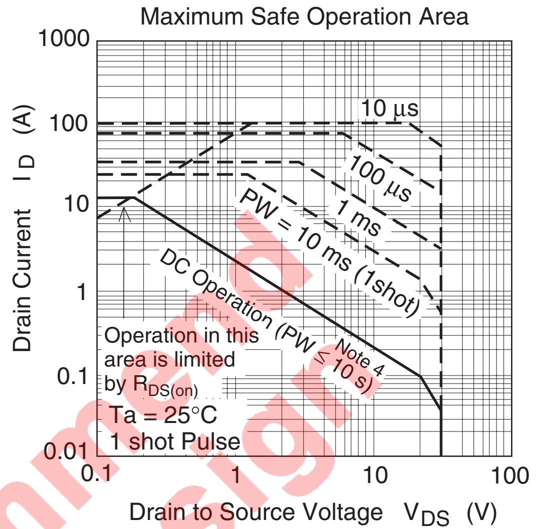
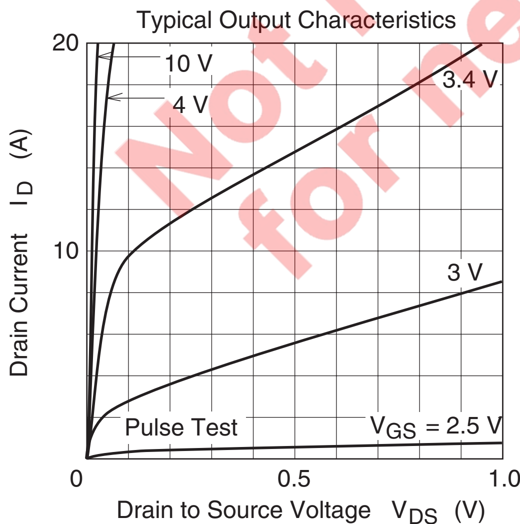
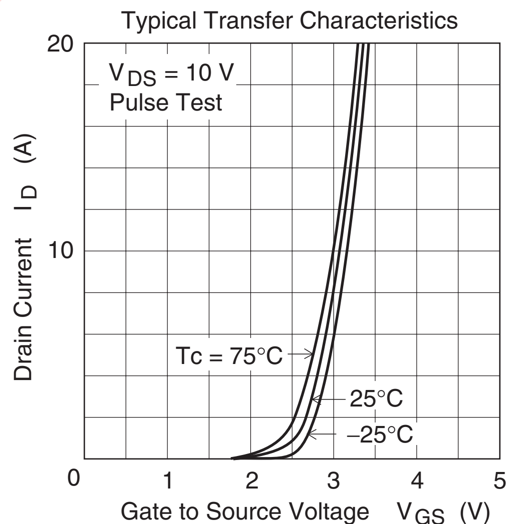
Main Characteristics

• **MOS1**









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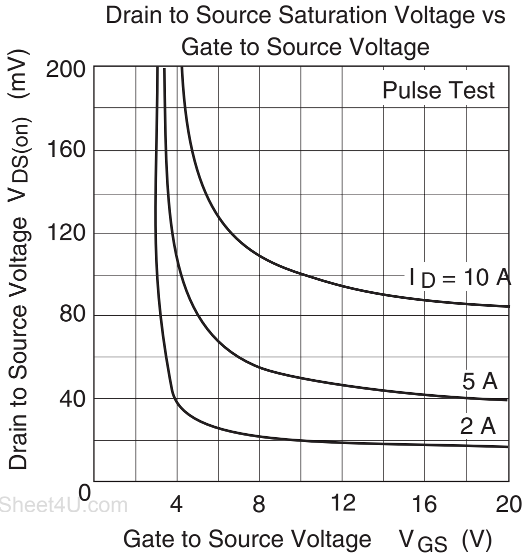

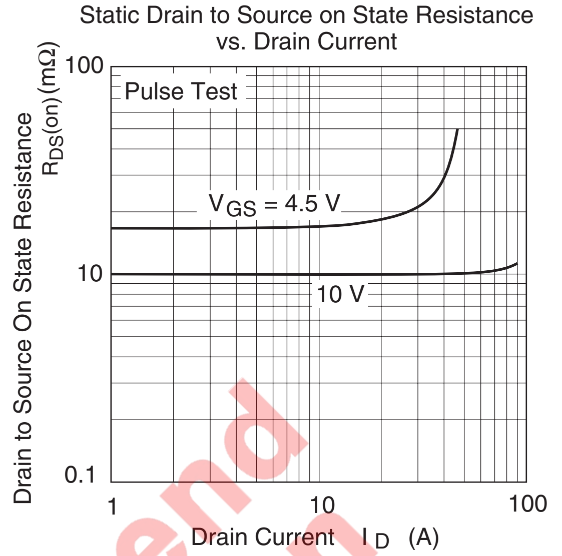

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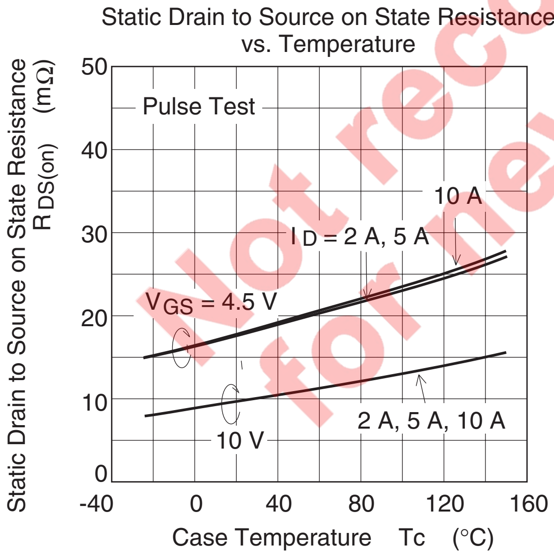

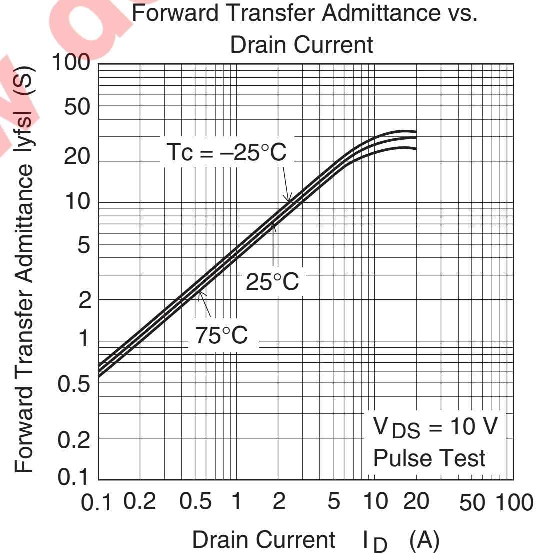

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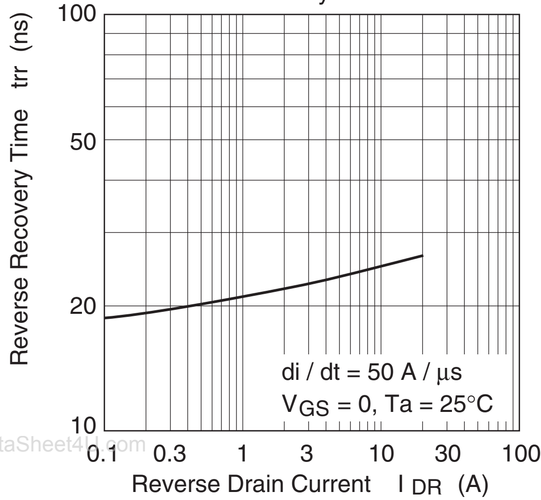

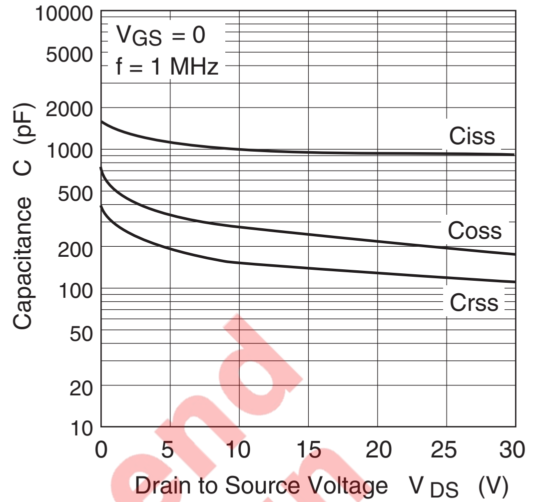

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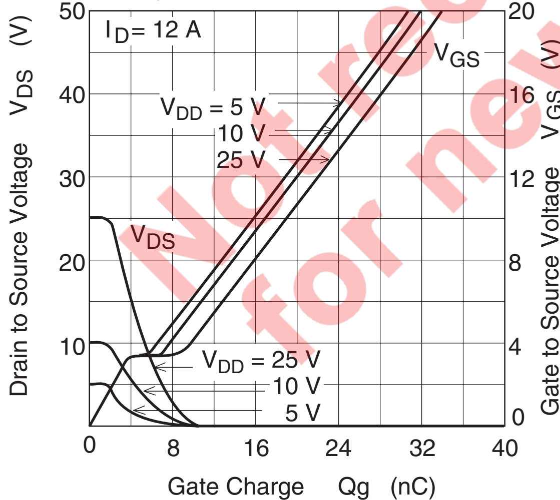

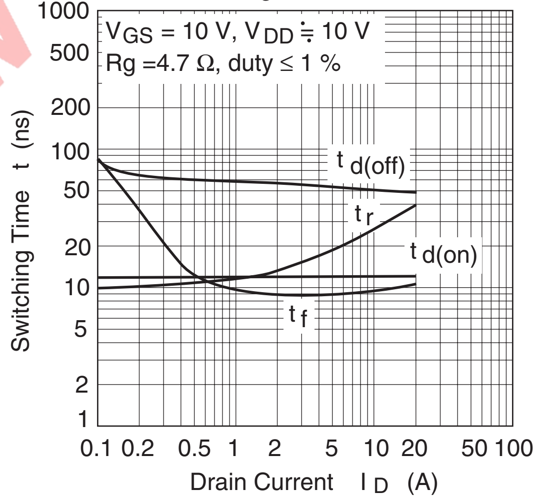

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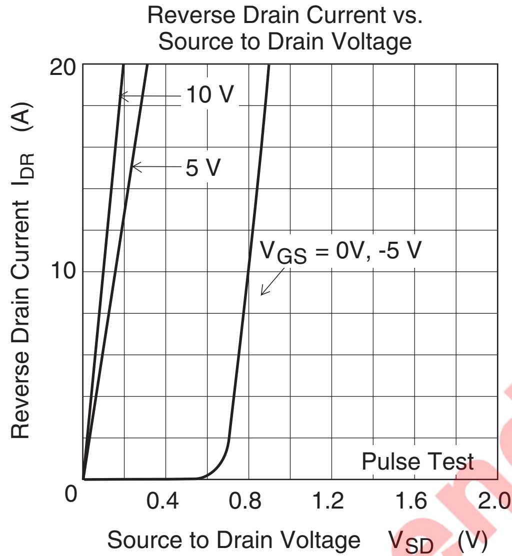

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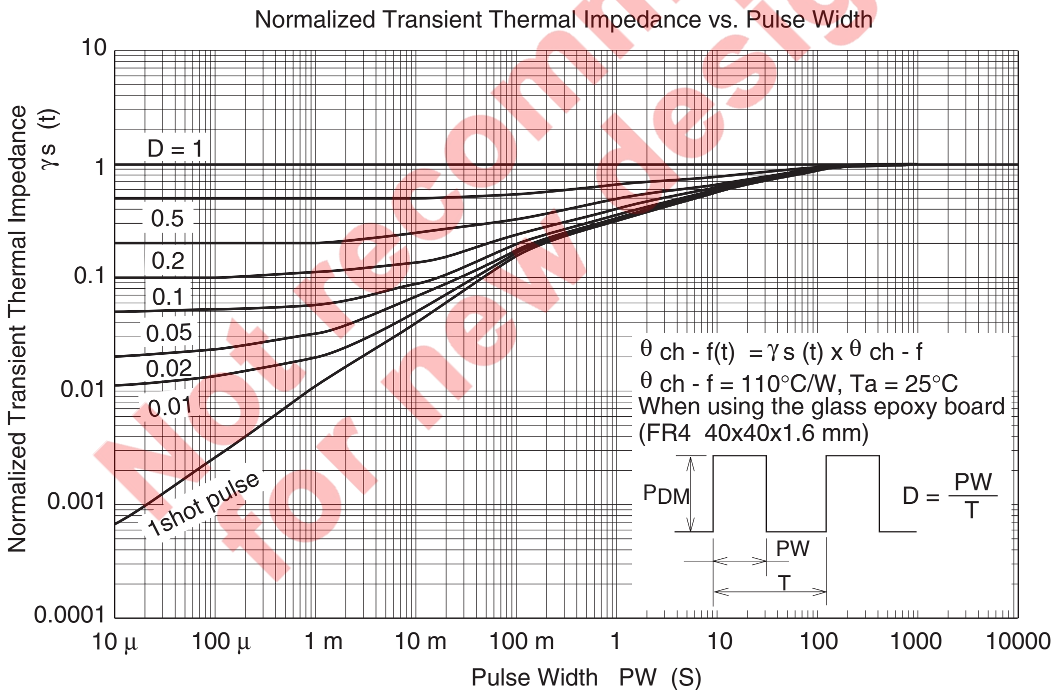

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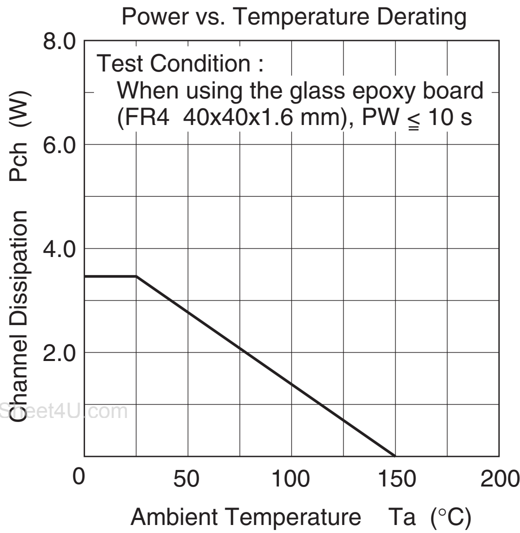
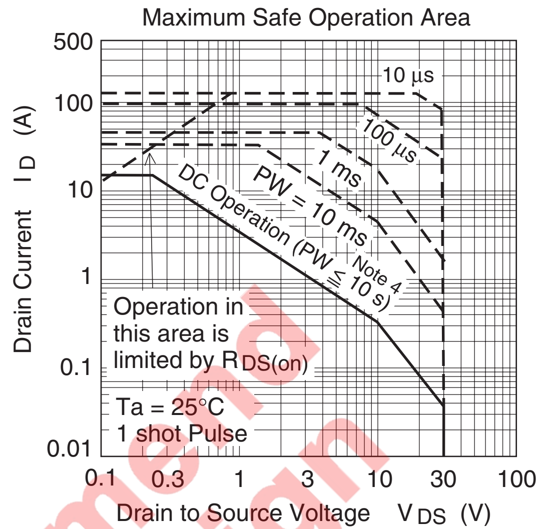
• **MOS2 & Schottky Barrier Diode**





Note 4 :
When using the glass epoxy board
(FR4 40x40x1.6 mm)

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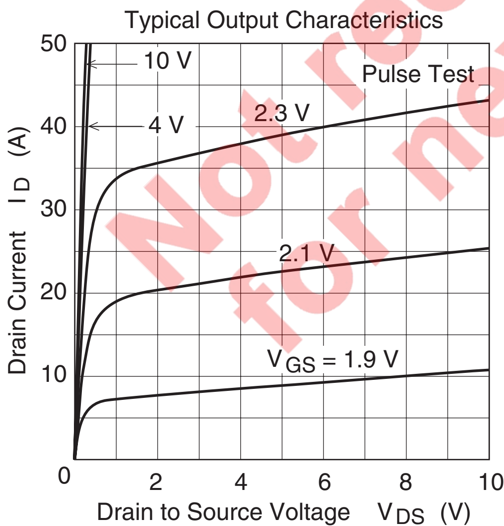

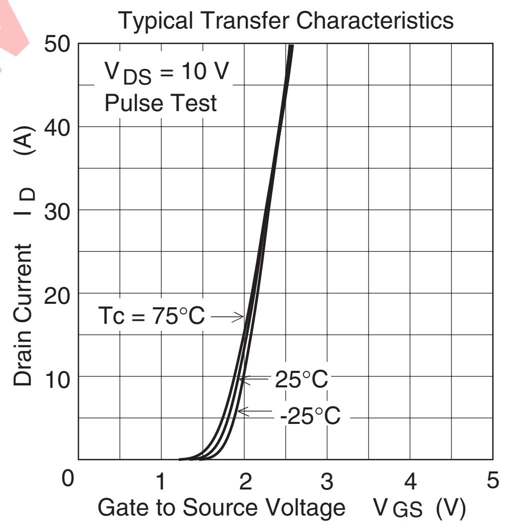

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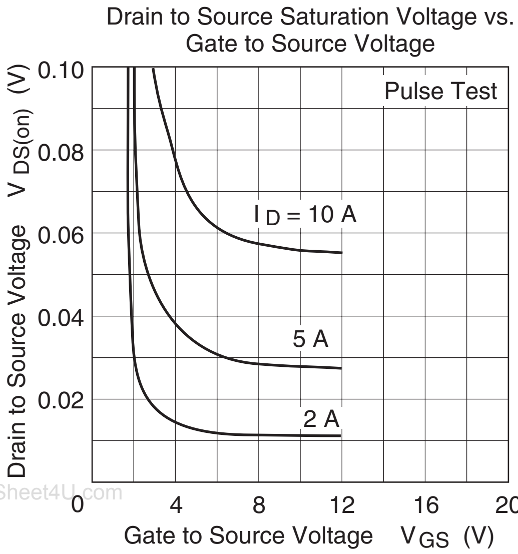

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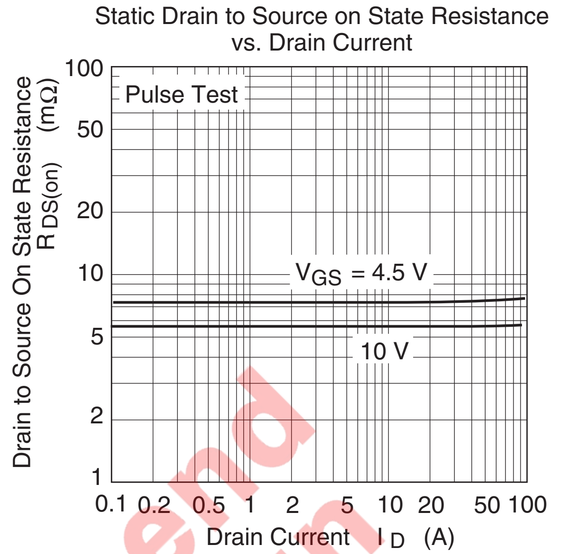

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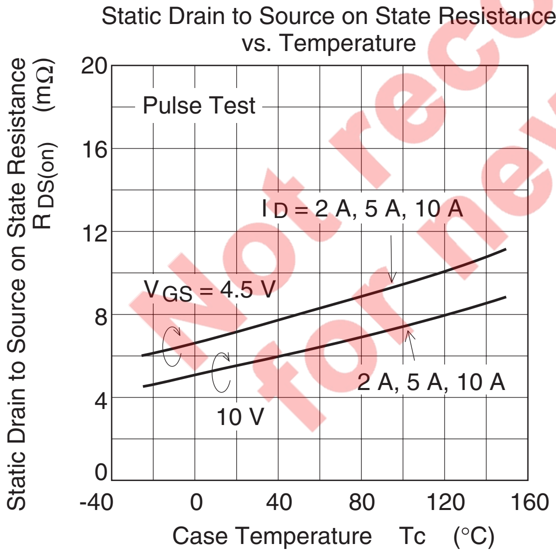

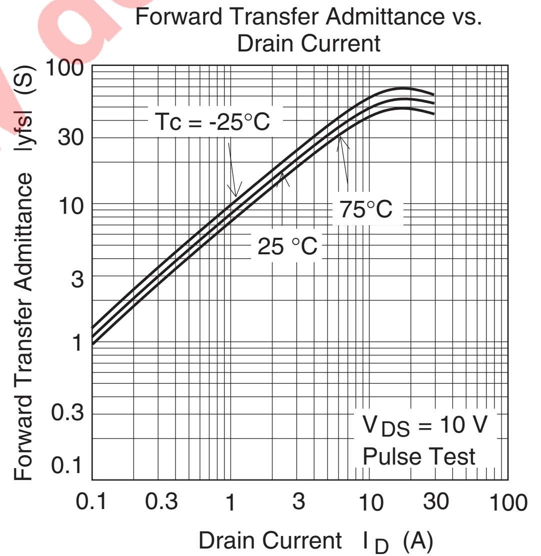

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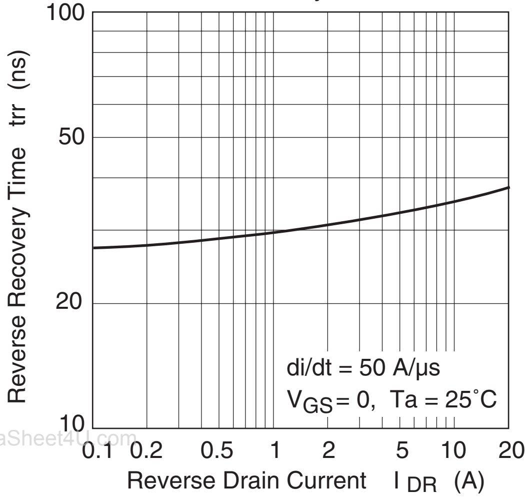

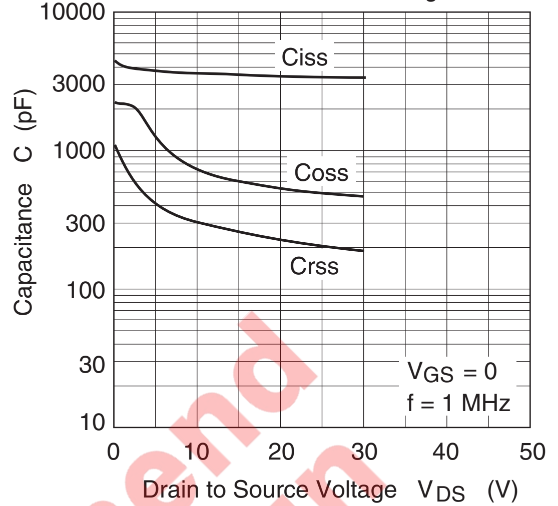

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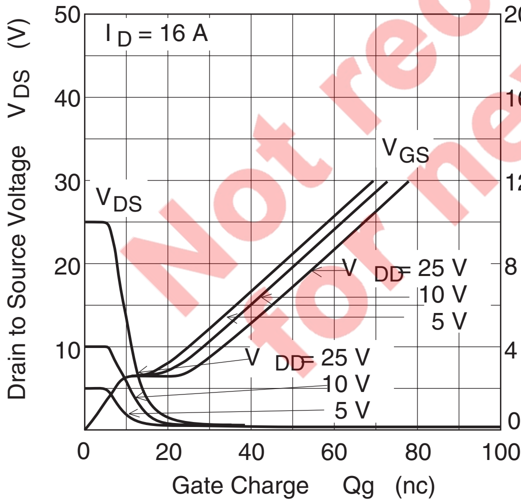

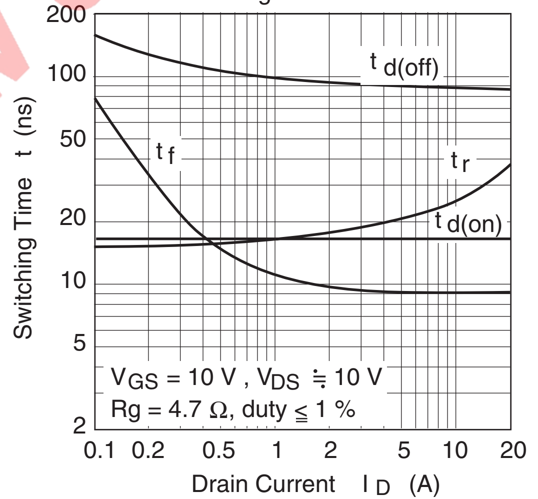

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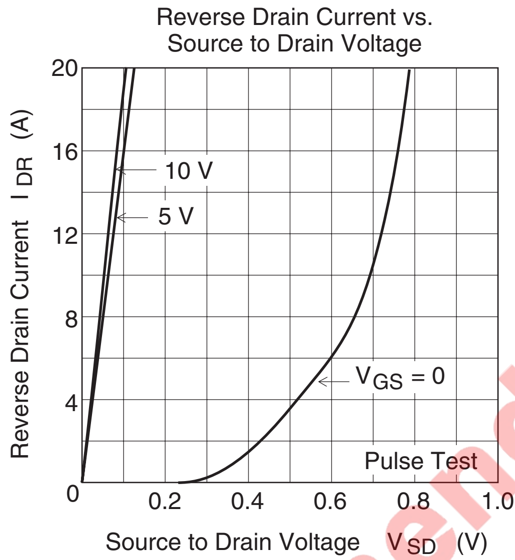

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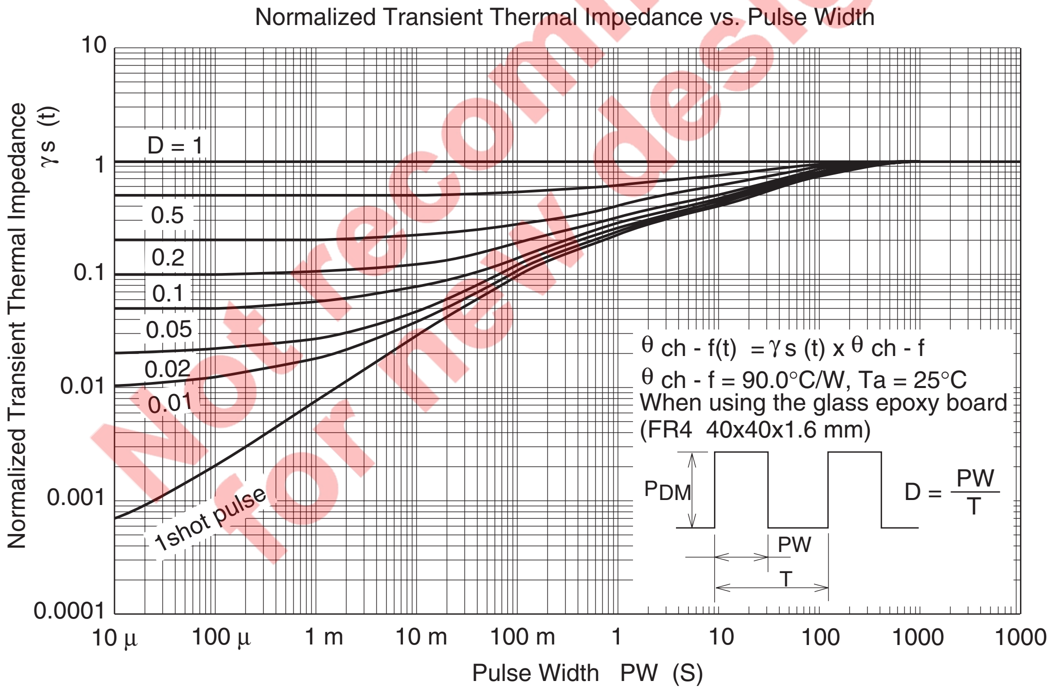

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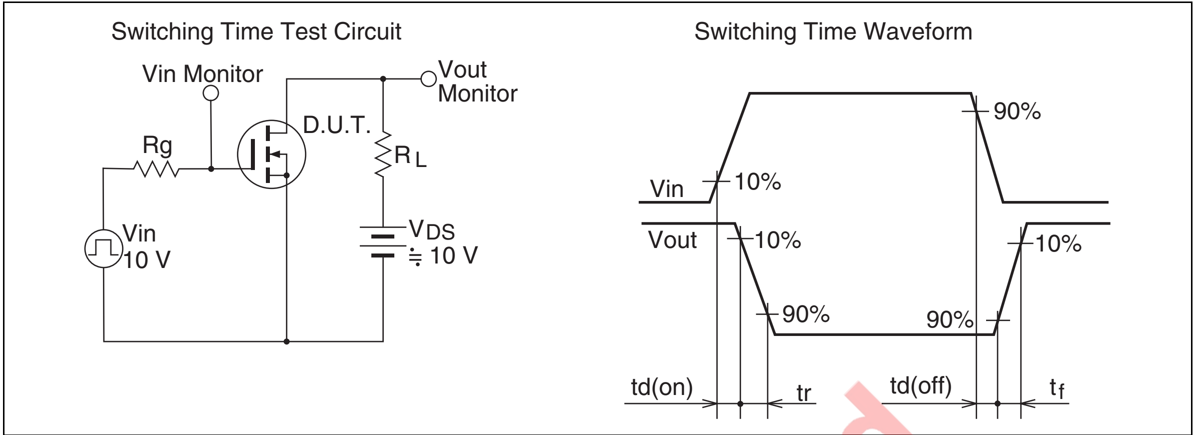

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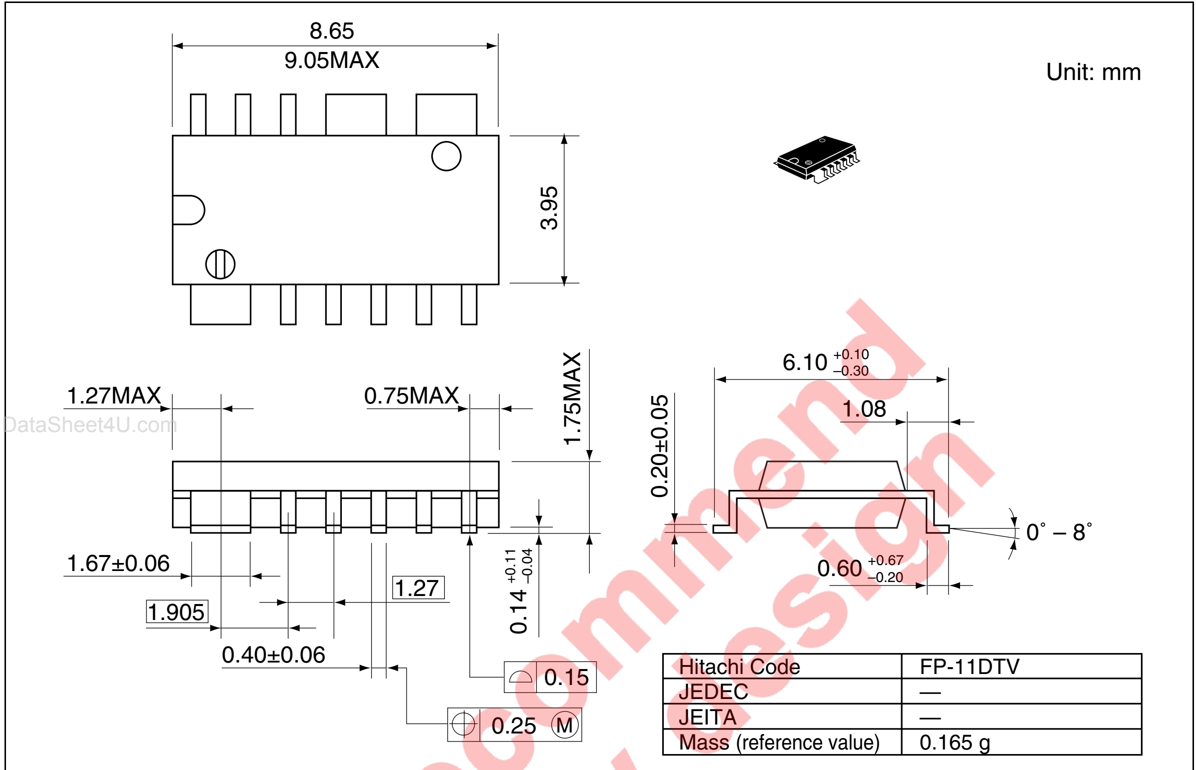
Package Dimensions



Hitachi Code	FP-11DTV
JEDEC	—
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Mass (reference value)	0.165 g

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