To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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H5N2007FN

Silicon N Channel MOS FET
High Speed Power Switching

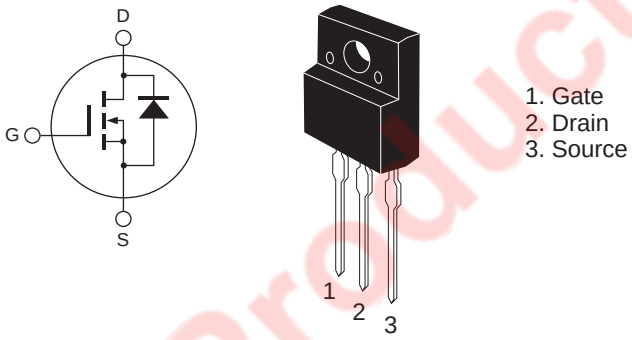
REJ03G0370-0100Z
Rev.1.00
May.28.2004

Features

- Low on-resistance
- Low leakage current
- High speed switching

Outline

TO-220FN



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to Source voltage	V_{DSS}	200	V
Gate to Source voltage	V_{GSS}	±30	V
Drain current	I_D	25	A
Drain peak current	$I_{D\ (pulse)}$ Note1	100	A
Body-Drain diode reverse Drain current	I_{DR}	25	A
Body-Drain diode reverse Drain peak current	$I_{DR\ (pulse)}$ Note1	100	A
Avalanche current	I_{AP} Note3	9	A
Avalanche energy	E_{AR} Note3	5.4	mJ
Channel dissipation	Pch Note2	30	W
Channel to case thermal impedance	θch-c	4.17	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. STch = 25°C, Tch ≤ 150°C

Electrical Characteristics

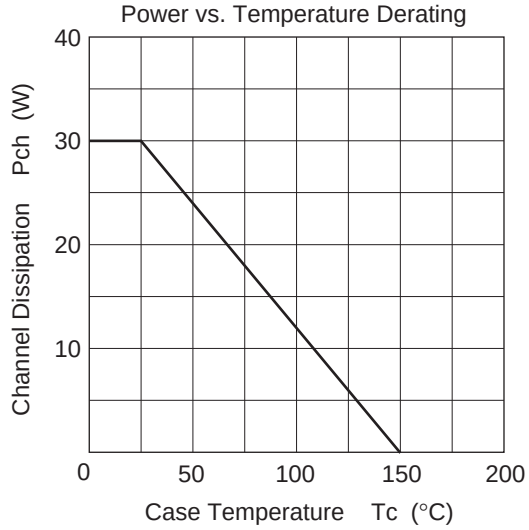
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	I_D = 10 mA, V_{GS} = 0
Zero Gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 200 V, V_{GS} = 0
Gate to Source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±30 V, V_{DS} = 0
Gate to Source cutoff voltage	$V_{GS(off)}$	3.0	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Forward transfer admittance	|yfs|	13	22	—	S	I_D = 12.5 A, V_{DS} = 10 V Note4
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.036	0.047	Ω	I_D = 12.5 A, V_{GS} = 10 V Note4
Input capacitance	Ciss	—	2200	—	pF	V_{DS} = 25 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	410	—	pF	
Reverse transfer capacitance	Crss	—	54	—	pF	
Turn-on delay time	td(on)	—	35	—	ns	I_D = 12.5 A V_{GS} = 10 V R_L = 8 Ω Rg = 10 Ω
Rise time	tr	—	120	—	ns	
Turn-off delay time	td(off)	—	110	—	ns	
Fall time	tf	—	85	—	ns	
Total Gate charge	Qg	—	56	—	nC	V_{DD} = 160 V V_{GS} = 10 V I_D = 25 A
Gate to Source charge	Qgs	—	13	—	nC	
Gate to Drain charge	Qgd	—	26	—	nC	
Body-Drain diode forward voltage	V_{DF}	—	0.9	1.5	V	I_F = 25 A, V_{GS} = 0 Note4
Body-Drain diode reverse recovery time	trr	—	140	—	ns	I_F = 25 A, V_{GS} = 0 diF/dt = 100 A/µs
Body-Drain diode reverse recovery charge	Qrr	—	0.7	—	µC	

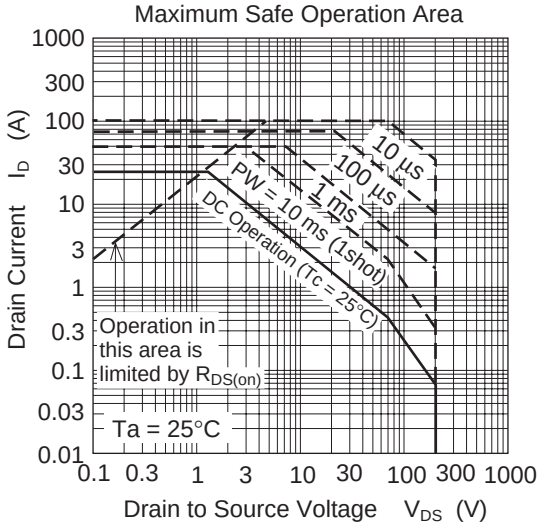
Notes: 4. Pulse test

Main Characteristics

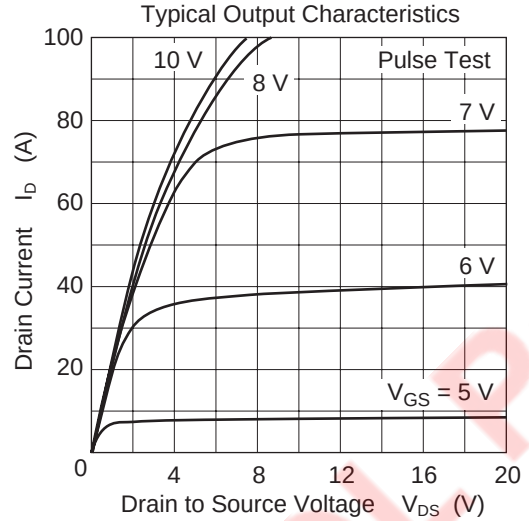
Power vs. Temperature Derating



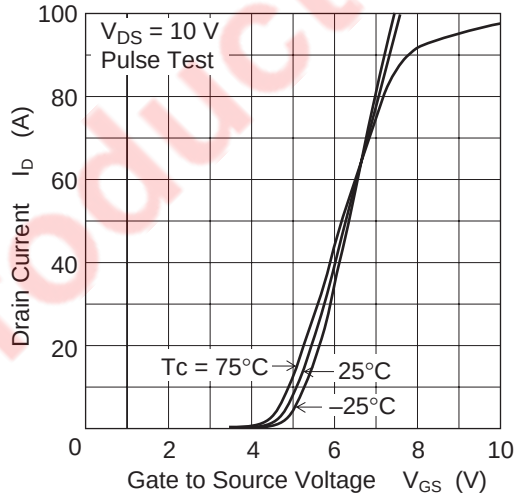
Maximum Safe Operation Area



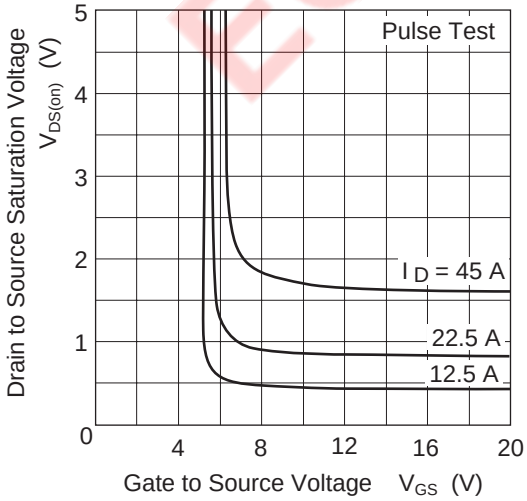
Typical Output Characteristics



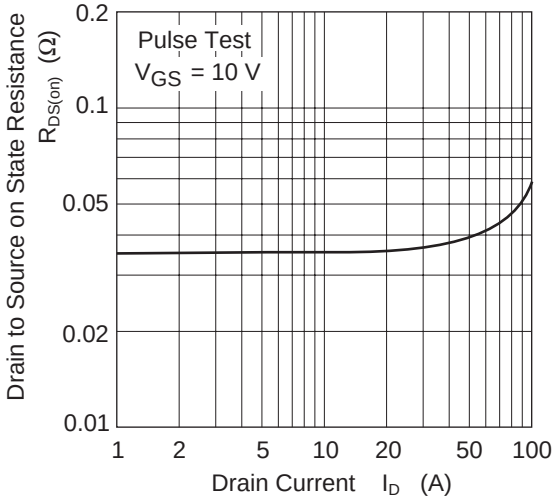
Typical Transfer Characteristics



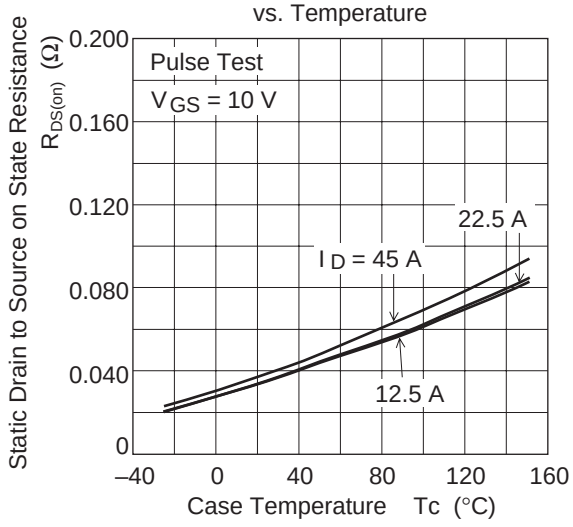
Drain to Source Saturation Voltage vs. Gate to Source Voltage



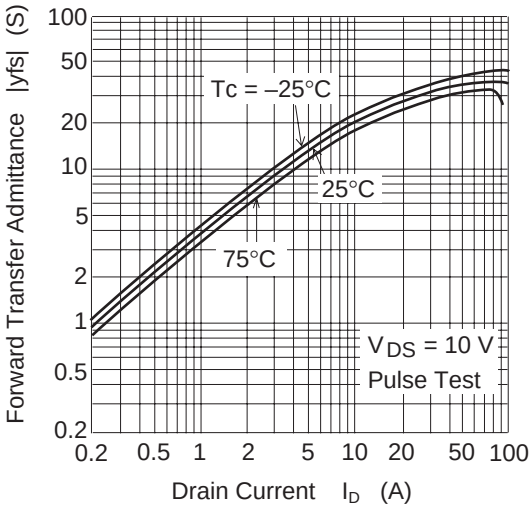
Static Drain to Source on State Resistance vs. Drain Current



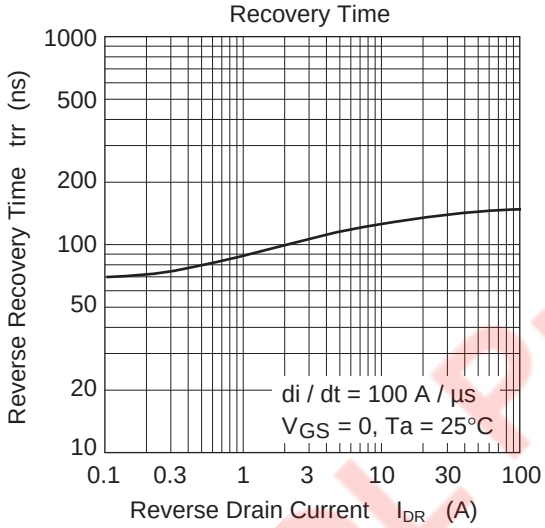
Static Drain to Source on State Resistance vs. Temperature



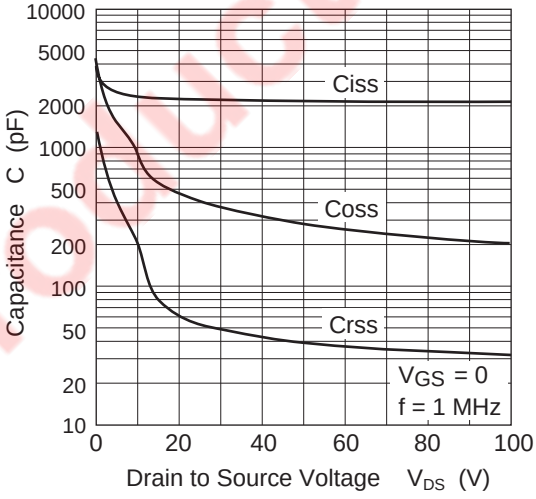
Forward Transfer Admittance vs. Drain Current



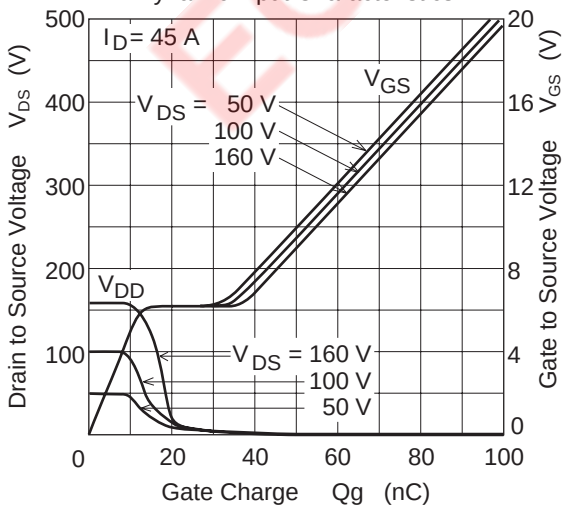
Body-Drain Diode Reverse Recovery Time



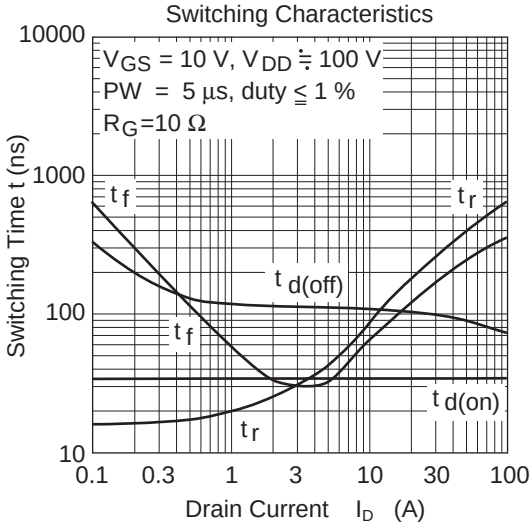
Typical Capacitance vs. Drain to Source Voltage



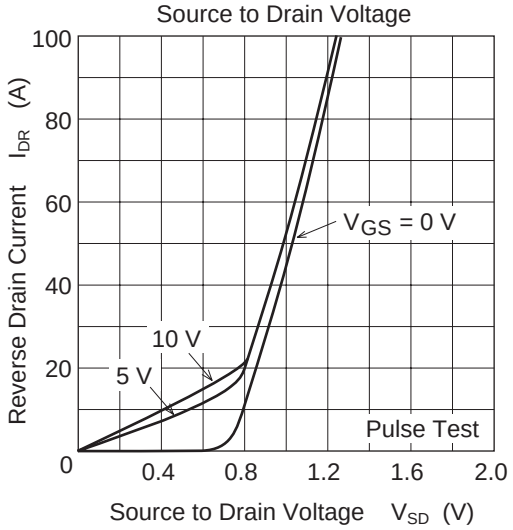
Dynamic Input Characteristics



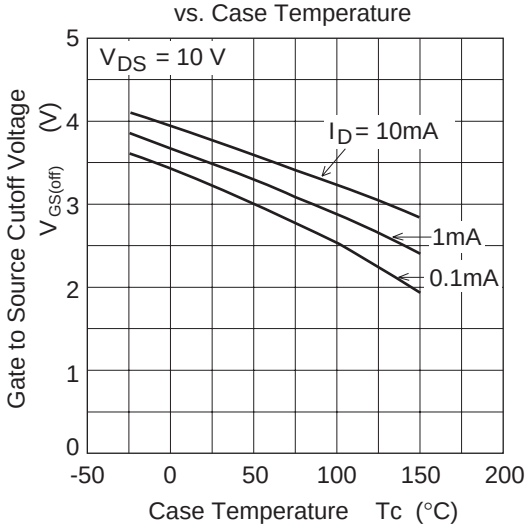
Switching Characteristics



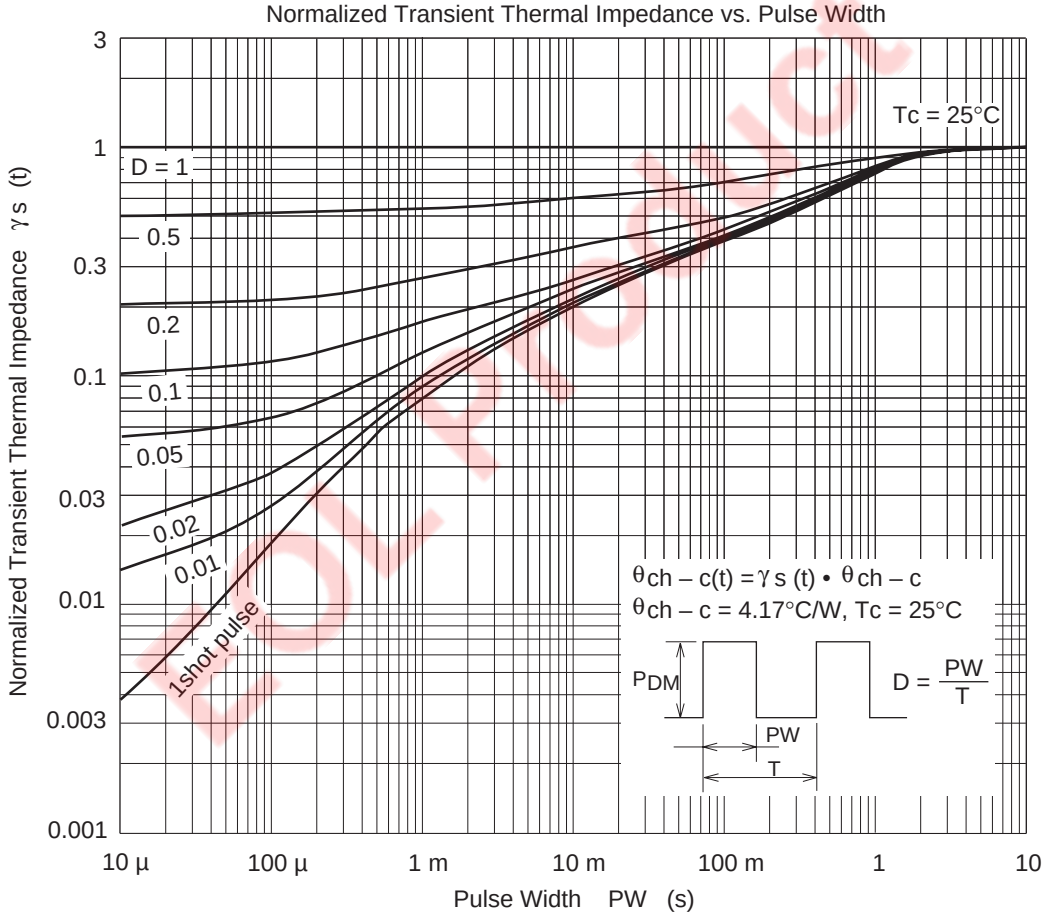
Reverse Drain Current vs.
Source to Drain Voltage



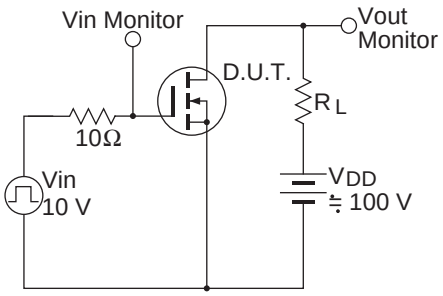
Gate to Source Cutoff Voltage
vs. Case Temperature



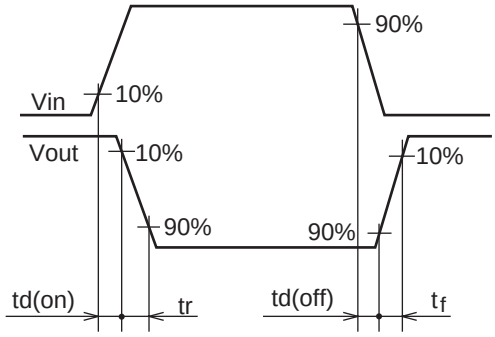
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



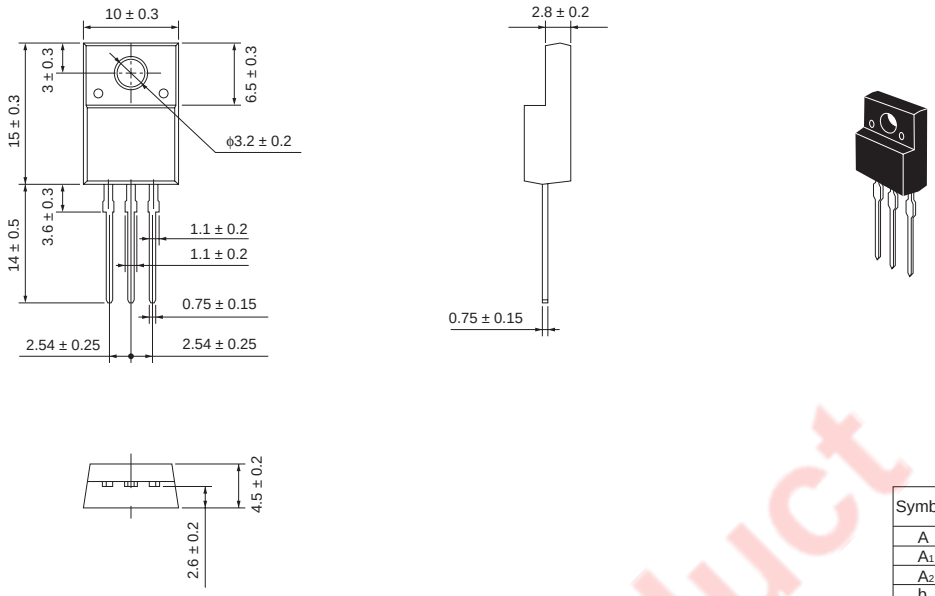
Waveform



Package Dimensions

TO-220FN

EIAJ Package Code	JEDEC Code	Mass (g) (reference value)	Lead Material
—	—	2.0	Cu alloy



Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.

Symbol	Dimension in Millimeters		
	Min	Typ	Max
A			
A_1			
A_2			
b			
D			
E			
e			
x			
y			
y_1			
ZD			
ZE			

Ordering Information

Part Name	Quantity	Shipping Container
H5N2007FN-E	50 pcs	Plastic magazine

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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