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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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Not recommended
for new design

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FX70KMJ-03

High-Speed Switching Use Pch Power MOS FET

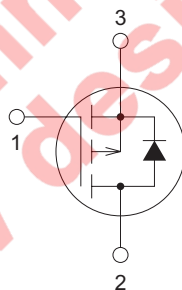
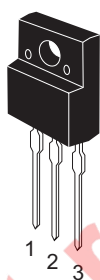
REJ03G1455-0200
(Previous: MEJ02G0270-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 4 V
- V_{DSS} : -30 V
- $r_{DS(ON) (max)}$: 12.3 m Ω
- I_D : -70 A
- Integrated Fast Recovery Diode (TYP.) : 70 ns
- Viso : 2000 V

Outline

RENESAS Package code: PRSS0003AB-A
(Package name: TO-220FN)



1. Gate
2. Drain
3. Source

Applications

Motor control, Lamp control, Solenoid control, DC-DC converters, etc.

Maximum Ratings

($T_c = 25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	-30	V	$V_{GS} = 0\text{ V}$
Gate-source voltage	V_{GSS}	± 20	V	$V_{DS} = 0\text{ V}$
Drain current	I_D	-70	A	
Drain current (Pulsed)	I_{DM}	-280	A	
Avalanche drain current (Pulsed)	I_{DA}	-70	A	$L = 10\ \mu\text{H}$
Source current	I_S	-70	A	
Source current (Pulsed)	I_{SM}	-280	A	
Maximum power dissipation	P_D	35	W	
Channel temperature	T_{ch}	- 55 to +150	$^\circ\text{C}$	
Storage temperature	T_{stg}	- 55 to +150	$^\circ\text{C}$	
Isolation voltage	Viso	2000	V	AC for 1 minute, Terminal to case
Mass	—	2.0	g	Typical value

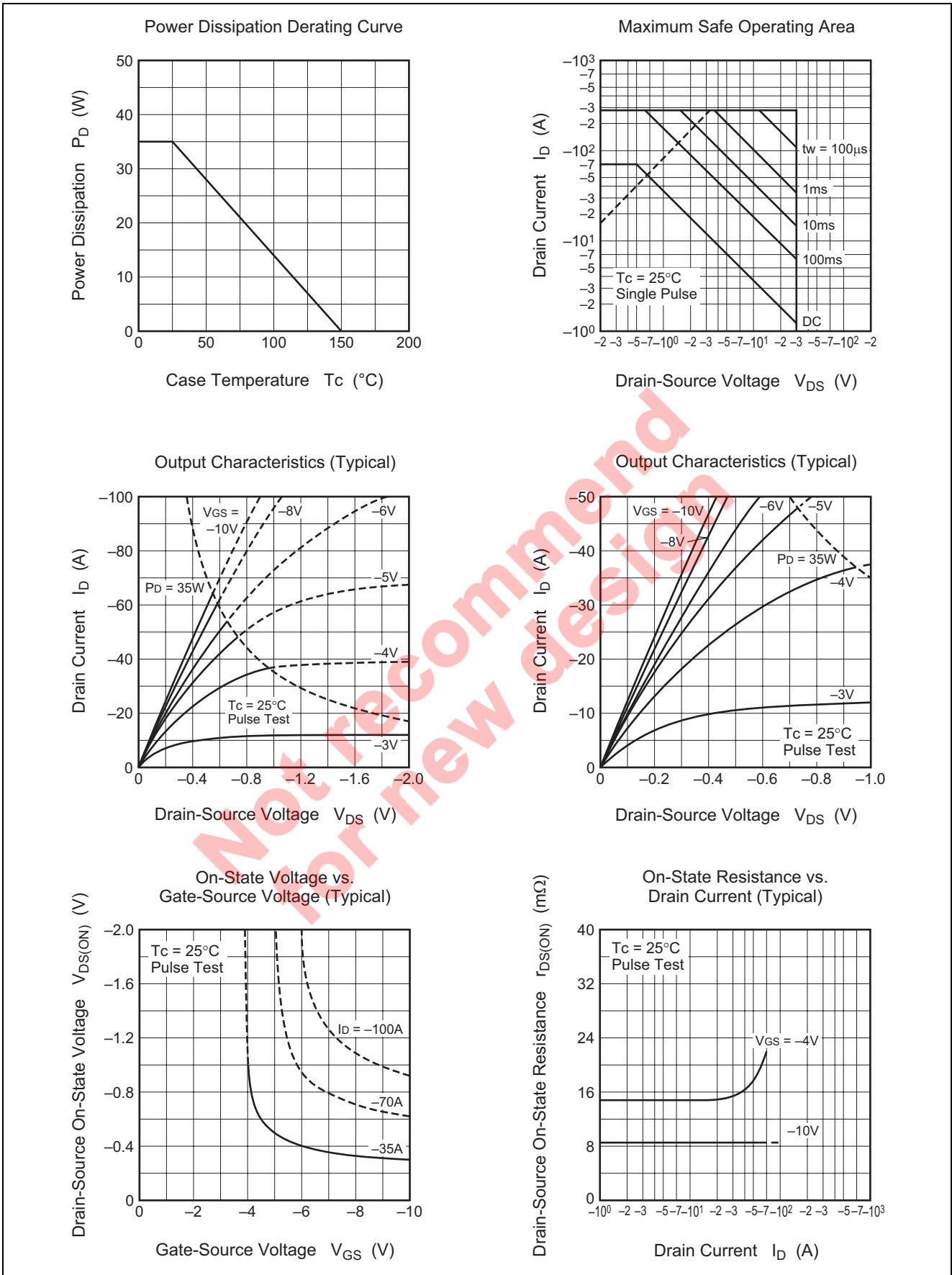
Electrical Characteristics

(T_{ch} = 25°C)

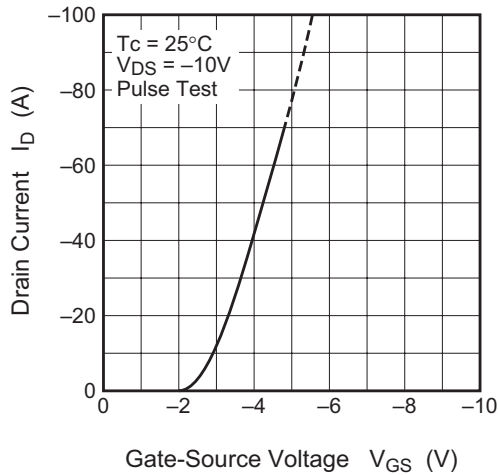
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	V _{(BR)DSS}	-30	—	—	V	I _D = -1 mA, V _{GS} = 0 V
Gate-source leakage current	I _{GSS}	—	—	±0.1	μA	V _{GS} = ±20 V, V _{DS} = 0 V
Drain-source leakage current	I _{DSS}	—	—	-0.1	mA	V _{DS} = -30 V, V _{GS} = 0 V
Gate-source threshold voltage	V _{GS(th)}	-1.3	-1.8	-2.3	V	I _D = -1 mA, V _{DS} = -10 V
Drain-source on-state resistance	r _{DS(ON)}	—	10.0	12.3	mΩ	I _D = -35 A, V _{GS} = -10 V
Drain-source on-state resistance	r _{DS(ON)}	—	19	25	mΩ	I _D = -26 A, V _{GS} = -4 V
Drain-source on-state voltage	V _{DS(ON)}	—	-0.35	-0.43	V	I _D = -35 A, V _{GS} = -10 V
Forward transfer admittance	y _{fs}	—	55.8	—	S	I _D = -35 A, V _{DS} = -10 V
Input capacitance	C _{iss}	—	11140	—	pF	V _{DS} = -10 V, V _{GS} = 0 V, f = 1MHz
Output capacitance	C _{oss}	—	2300	—	pF	
Reverse transfer capacitance	C _{rss}	—	1000	—	pF	
Turn-on delay time	t _{d(on)}	—	85	—	ns	V _{DD} = -15 V, I _D = -35 A, V _{GS} = -10 V, R _{GEN} = R _{GS} = 50 Ω
Rise time	t _r	—	228	—	ns	
Turn-off delay time	t _{d(off)}	—	751	—	ns	
Fall time	t _f	—	360	—	ns	
Source-drain voltage	V _{SD}	—	-1.0	-1.5	V	I _S = -35 A, V _{GS} = 0 V
Thermal resistance	R _{th(ch-c)}	—	—	3.57	°C/W	Channel to case
Reverse recovery time	t _{rr}	—	70	—	ns	I _S = -35 A, d _{is} /d _t = 50 A/μs

Not recommended
for new designs

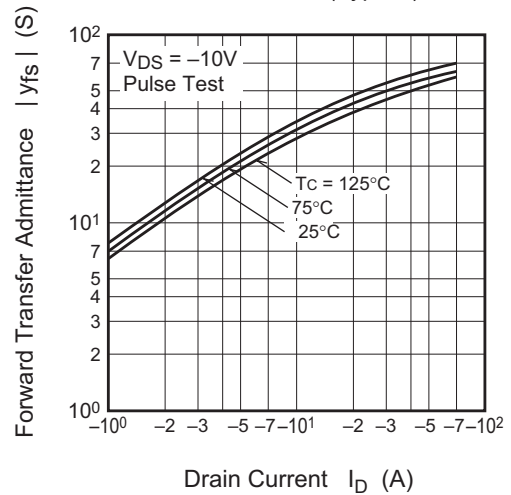
Performance Curves



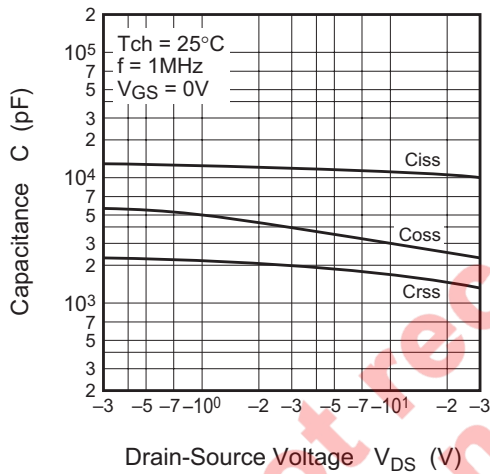
Transfer Characteristics (Typical)



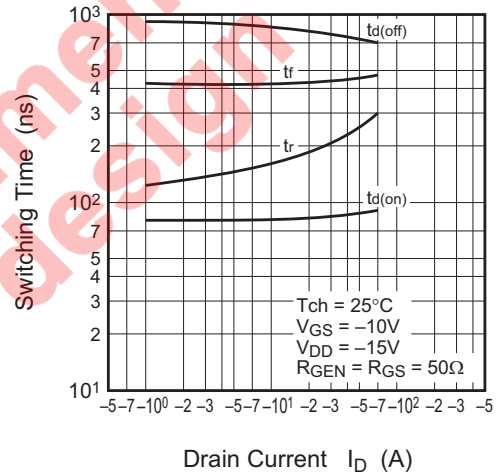
Forward Transfer Admittance vs. Drain Current (Typical)



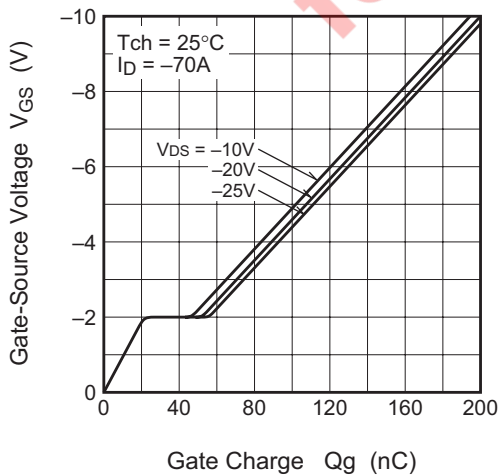
Capacitance vs. Drain-Source Voltage (Typical)



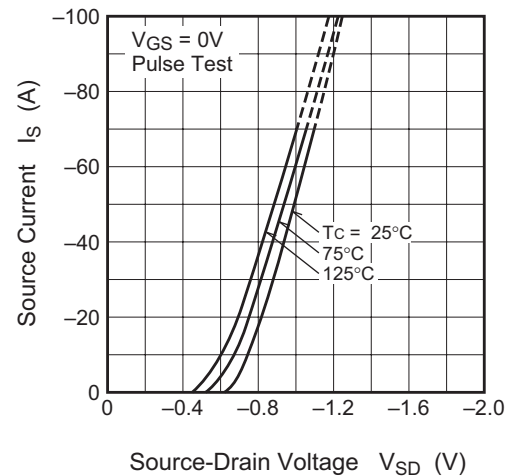
Switching Characteristics (Typical)

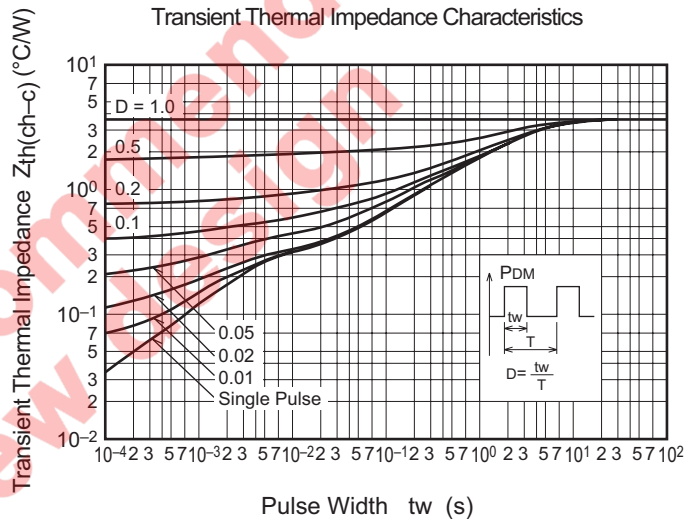
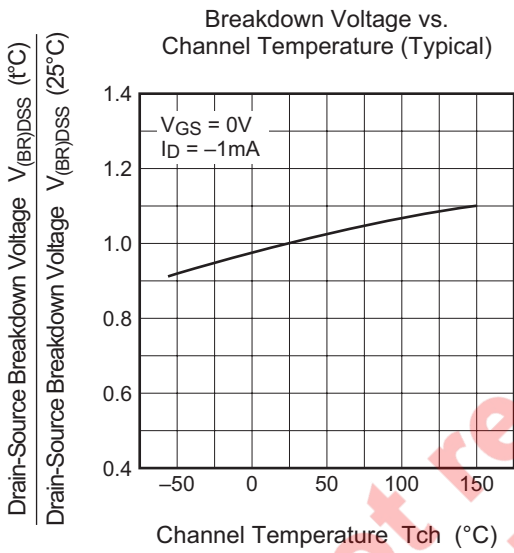
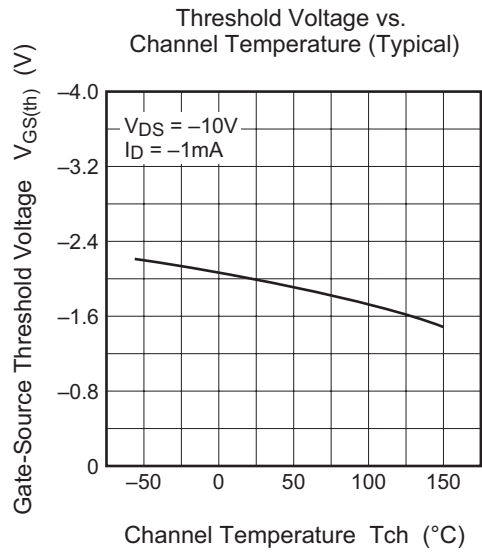
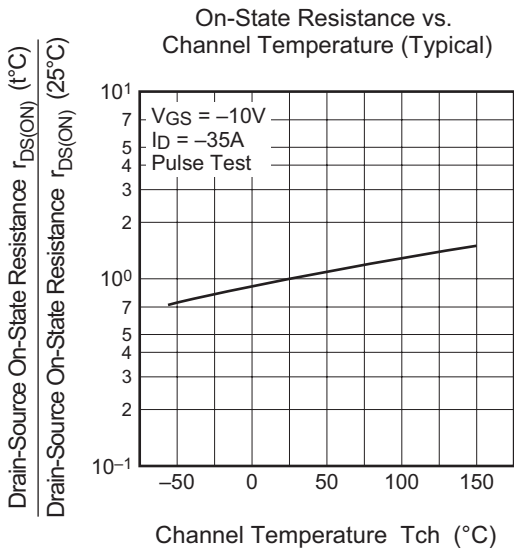


Gate-Source Voltage vs. Gate Charge (Typical)

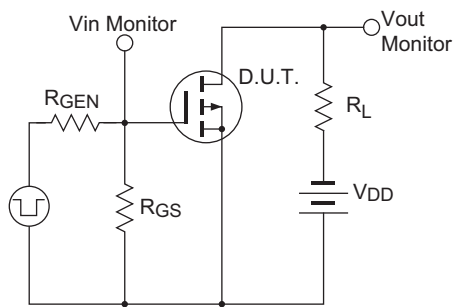


Source-Drain Diode Forward Characteristics (Typical)

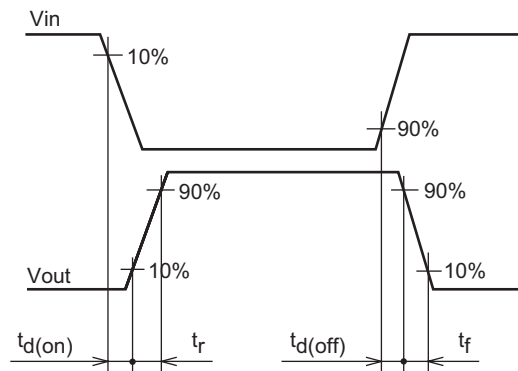




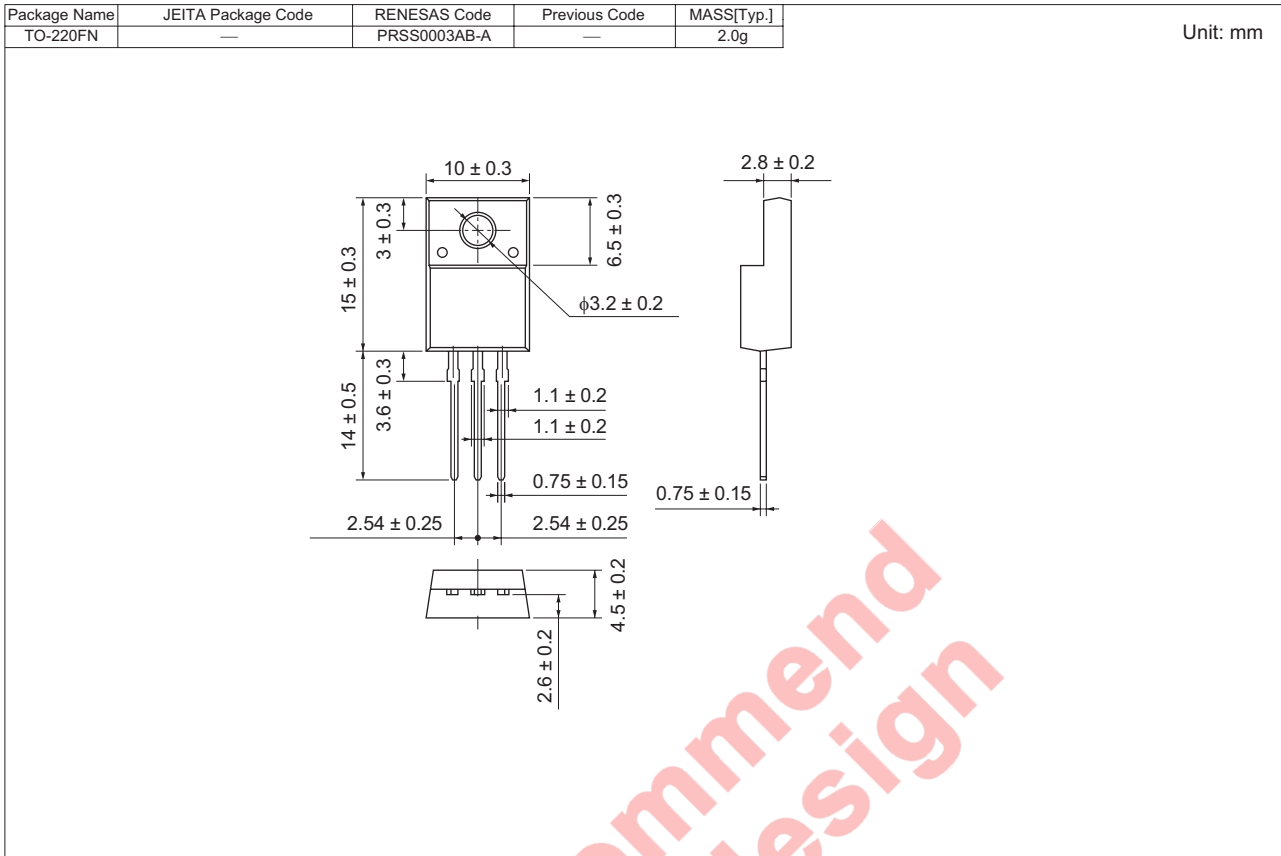
Switching Time Measurement Circuit



Switching Waveform



Package Dimensions



Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	FX70KMJ-03
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FX70KMJ-03-A8

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