

# FX50KMJ-03

## High-Speed Switching Use Pch Power MOS FET

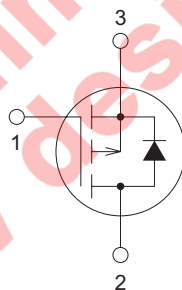
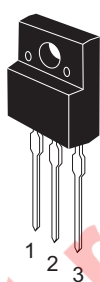
REJ03G1450-0200  
(Previous: MEJ02G0268-0101)  
Rev.2.00  
Aug 07, 2006

### Features

- Drive voltage : 4 V
- $V_{DSS}$  : -30 V
- $r_{DS(ON)(max)}$  : 35 m $\Omega$
- $I_D$  : -50 A
- Integrated Fast Recovery Diode (TYP.) : 55 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	$V_{GSS}$	$\pm 20$	V	$V_{DS} = 0\text{ V}$
Drain current	$I_D$	-50	A	
Drain current (Pulsed)	$I_{DM}$	-200	A	
Avalanche drain current (Pulsed)	$I_{DA}$	-50	A	$L = 10\ \mu\text{H}$
Source current	$I_S$	-50	A	
Source current (Pulsed)	$I_{SM}$	-200	A	
Maximum power dissipation	$P_D$	30	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

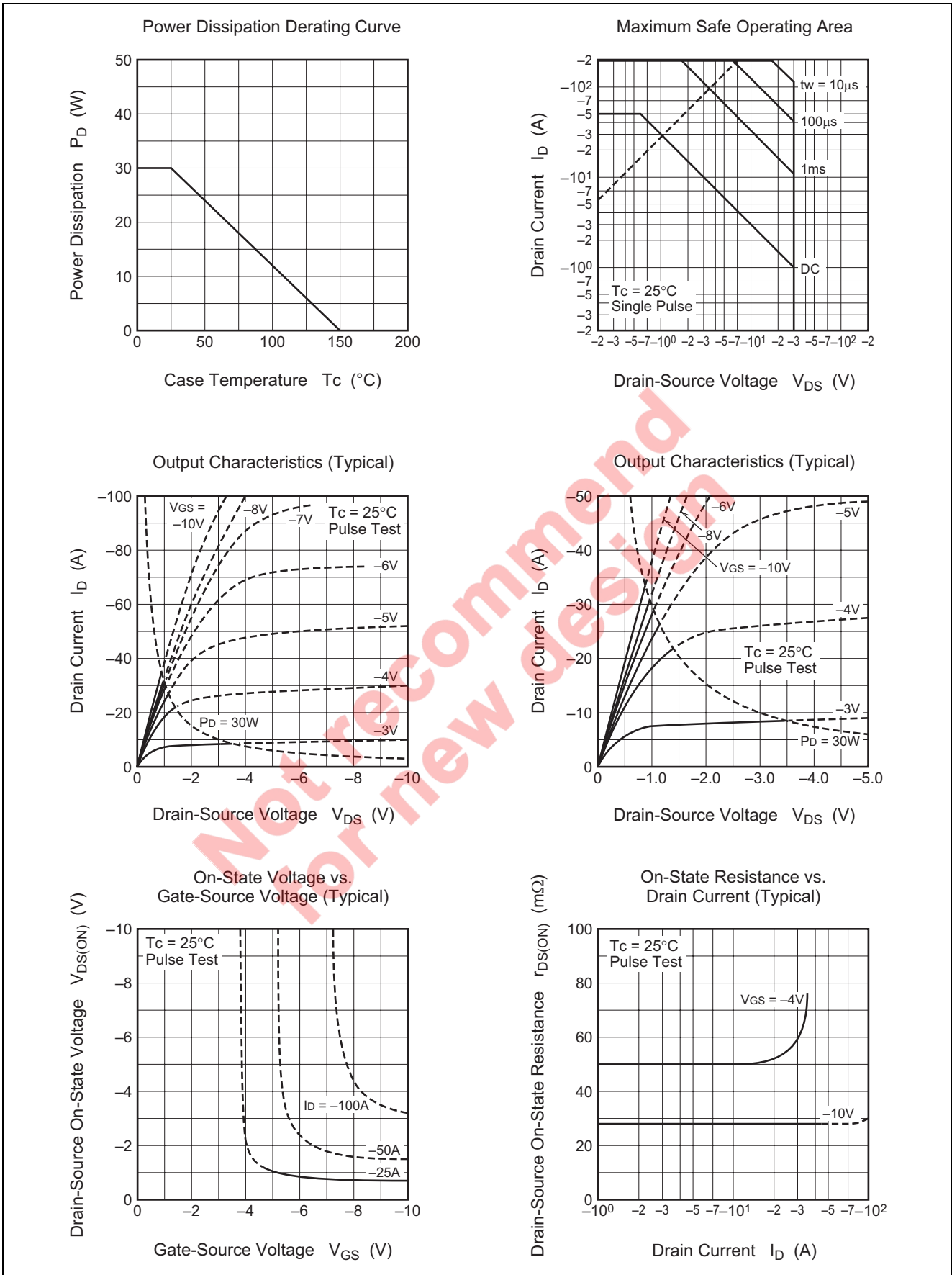
## Electrical Characteristics

(T<sub>ch</sub> = 25°C)

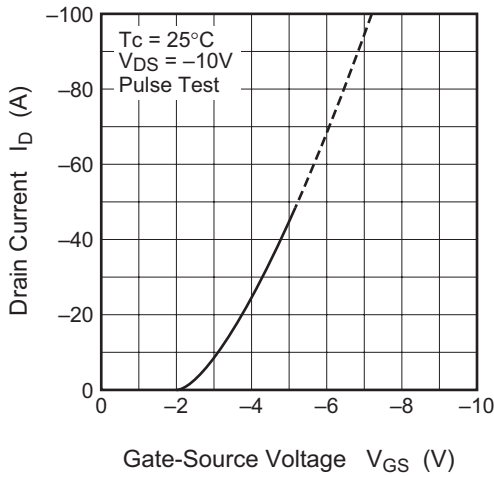
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -1 \text{ mA}$ , $V_{GS} = 0 \text{ V}$
Gate-source leakage current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$
Drain-source leakage current	$I_{DSS}$	—	—	-0.1	mA	$V_{DS} = -30 \text{ V}$ , $V_{GS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	-1.3	-1.8	-2.3	V	$I_D = -1 \text{ mA}$ , $V_{DS} = -10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	28	35	m $\Omega$	$I_D = -25 \text{ A}$ , $V_{GS} = -10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	54	72	m $\Omega$	$I_D = -9 \text{ A}$ , $V_{GS} = -4 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	-0.70	-0.88	V	$I_D = -25 \text{ A}$ , $V_{GS} = -10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	23	—	S	$I_D = -25 \text{ A}$ , $V_{DS} = -10 \text{ V}$
Input capacitance	$C_{iss}$	—	4270	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	695	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	342	—	pF	
Turn-on delay time	$t_{d(on)}$	—	21	—	ns	$V_{DD} = -15 \text{ V}$ , $I_D = -25 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_{GEN} = R_{GS} = 50 \Omega$
Rise time	$t_r$	—	103	—	ns	
Turn-off delay time	$t_{d(off)}$	—	223	—	ns	
Fall time	$t_f$	—	122	—	ns	
Source-drain voltage	$V_{SD}$	—	-1.0	-1.5	V	$I_S = -25 \text{ A}$ , $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	4.17	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	$t_{rr}$	—	55	—	ns	$I_S = -25 \text{ A}$ , $d_i/d_t = 50 \text{ A}/\mu\text{s}$

Not recommended  
for new designs

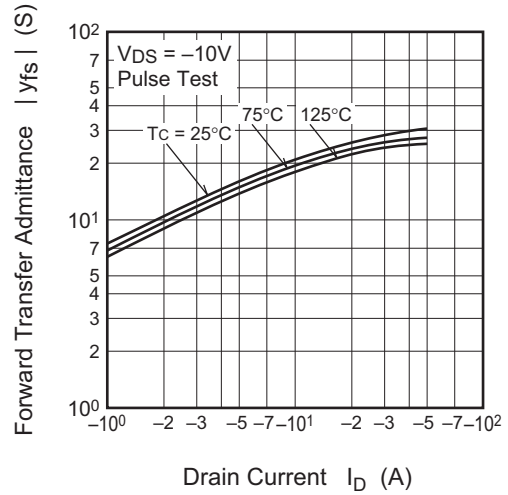
Performance Curves



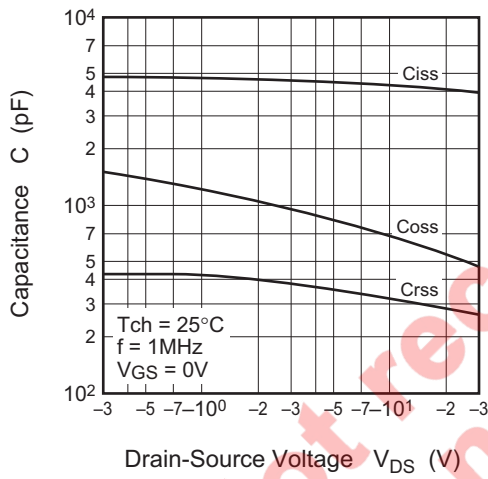
Transfer Characteristics (Typical)



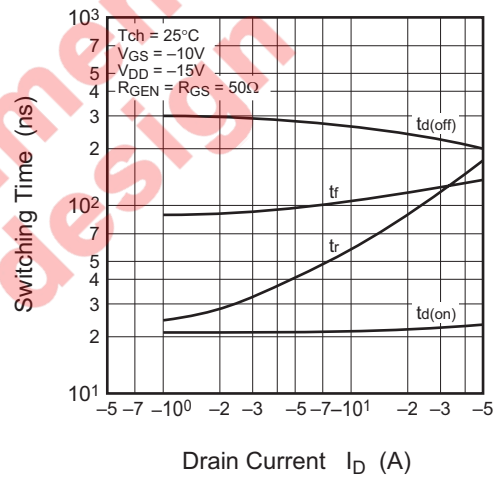
Forward Transfer Admittance vs. Drain Current (Typical)



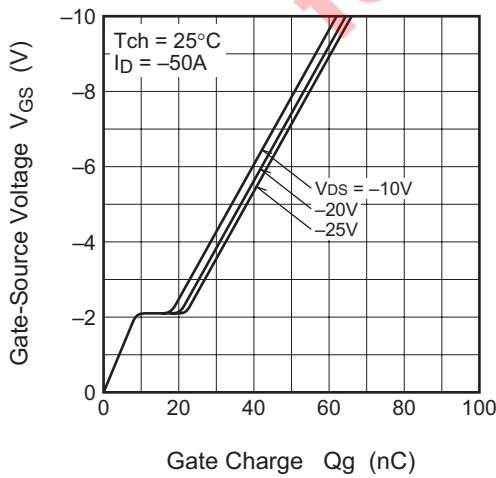
Capacitance vs. Drain-Source Voltage (Typical)



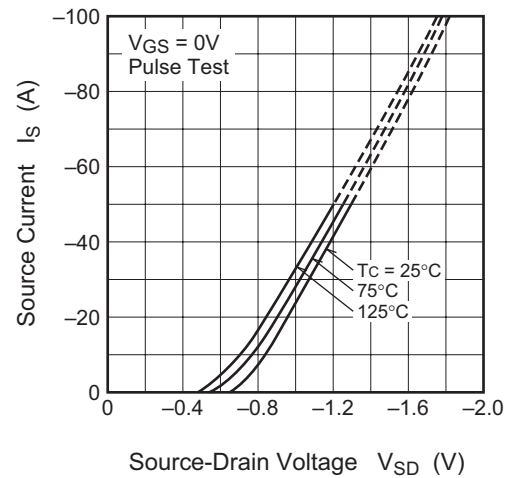
Switching Characteristics (Typical)

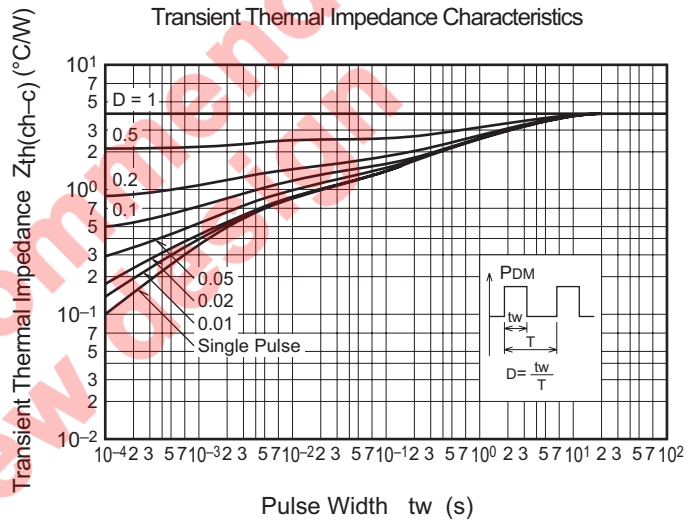
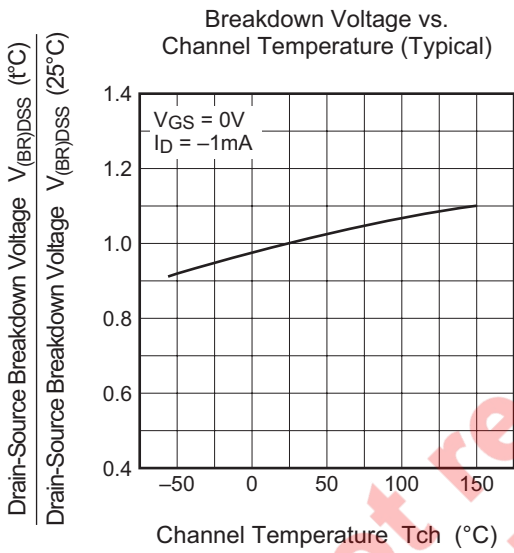
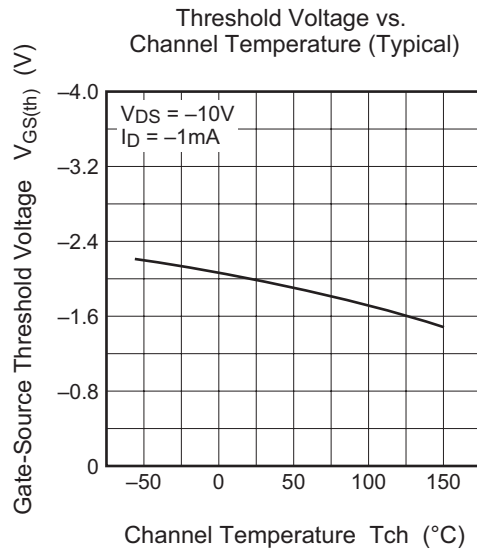
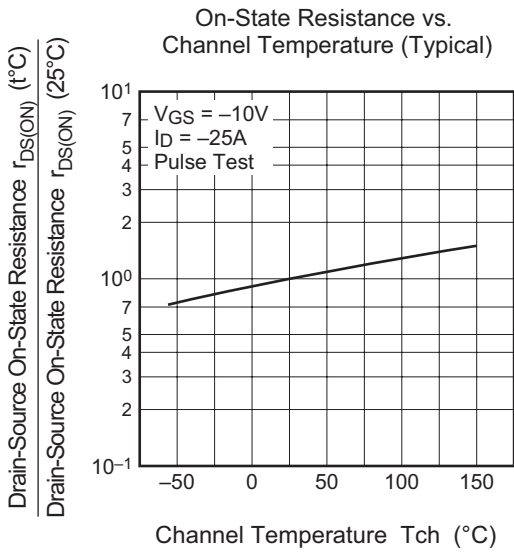


Gate-Source Voltage vs. Gate Charge (Typical)

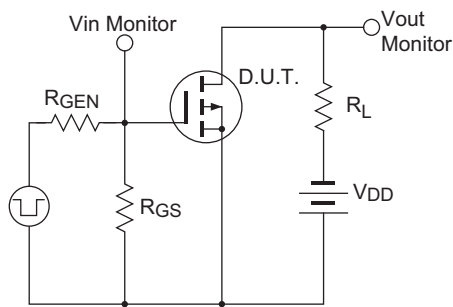


Source-Drain Diode Forward Characteristics (Typical)

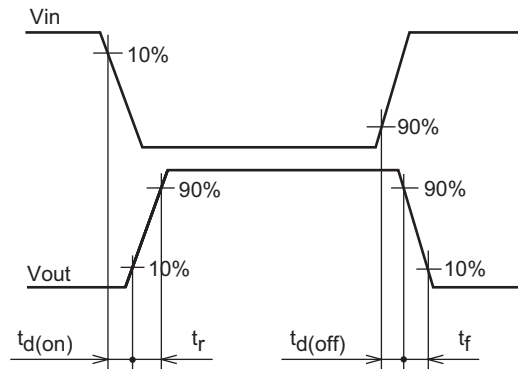




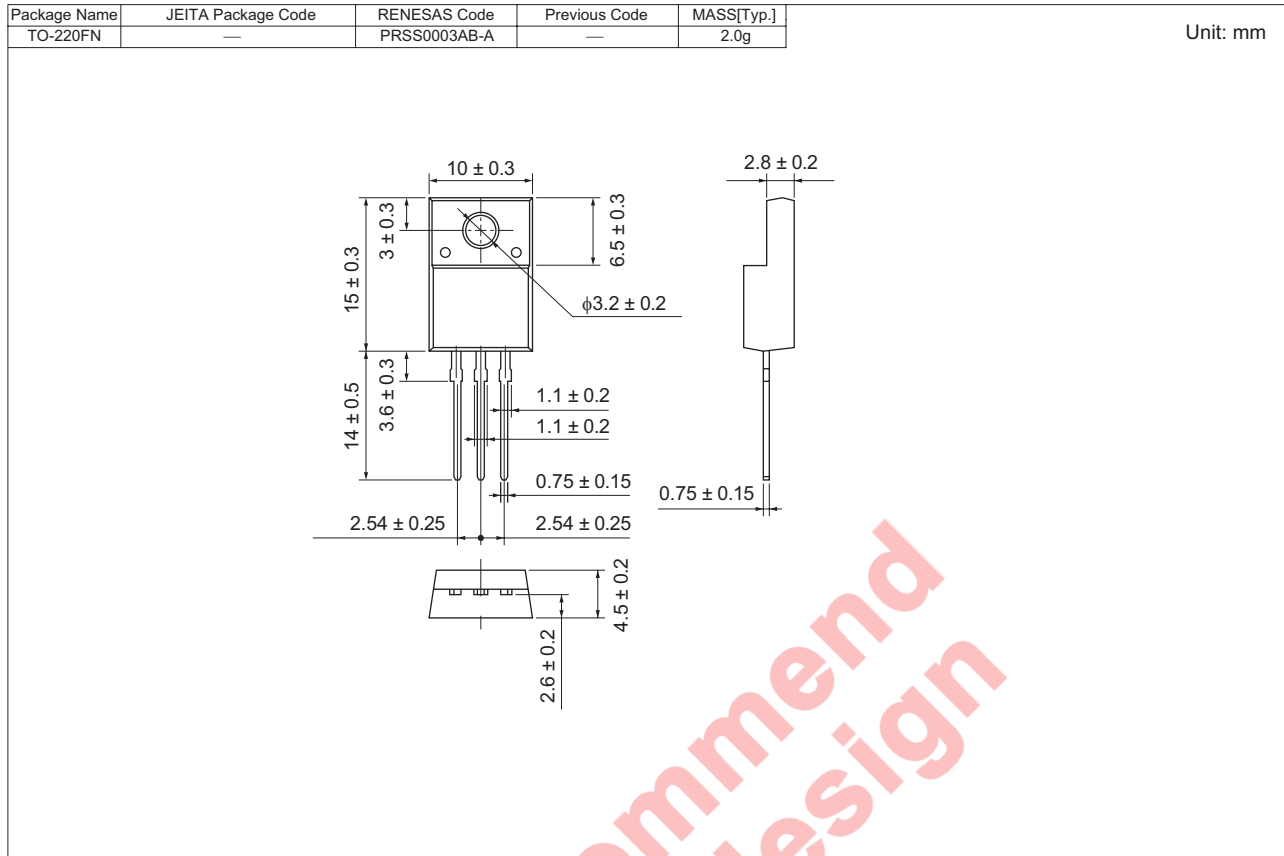
Switching Time Measurement Circuit



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	FX50KMJ-03
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FX50KMJ-03-A8

Note: Please confirm the specification about the shipping in detail.

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**Renesas Technology America, Inc.**

450 Holger Way, San Jose, CA 95134-1368, U.S.A  
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

**Renesas Technology Europe Limited**

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.  
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

**Renesas Technology (Shanghai) Co., Ltd.**

Unit 204, 205, AZIAcenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120  
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

**Renesas Technology Hong Kong Ltd.**

7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong  
Tel: <852> 2265-6688, Fax: <852> 2730-6071

**Renesas Technology Taiwan Co., Ltd.**

10th Floor, No.99, Fushing North Road, Taipei, Taiwan  
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

**Renesas Technology Singapore Pte. Ltd.**

1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632  
Tel: <65> 6213-0200, Fax: <65> 6278-8001

**Renesas Technology Korea Co., Ltd.**

Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea  
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

**Renesas Technology Malaysia Sdn. Bhd**

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: <603> 7955-9390, Fax: <603> 7955-9510