

# FX20KMJ-06

## High-Speed Switching Use Pch Power MOS FET

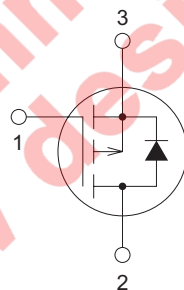
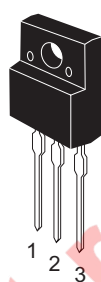
REJ03G1442-0200  
(Previous: MEJ02G0275-0101)  
Rev.2.00  
Aug 07, 2006

### Features

- Drive voltage : 4 V
- $V_{DSS}$  : - 60 V
- $r_{DS(ON) (max)}$  : 97 m $\Omega$
- $I_D$  : - 20 A
- Integrated Fast Recovery Diode (TYP.) : 50 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	$V_{DSS}$	-60	V	$V_{GS} = 0\text{ V}$
Gate-source voltage	$V_{GSS}$	$\pm 20$	V	$V_{DS} = 0\text{ V}$
Drain current	$I_D$	-20	A	
Drain current (Pulsed)	$I_{DM}$	-80	A	
Avalanche drain current (Pulsed)	$I_{DA}$	-20	A	$L = 100\ \mu\text{H}$
Source current	$I_S$	-20	A	
Source current (Pulsed)	$I_{SM}$	-80	A	
Maximum power dissipation	$P_D$	25	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

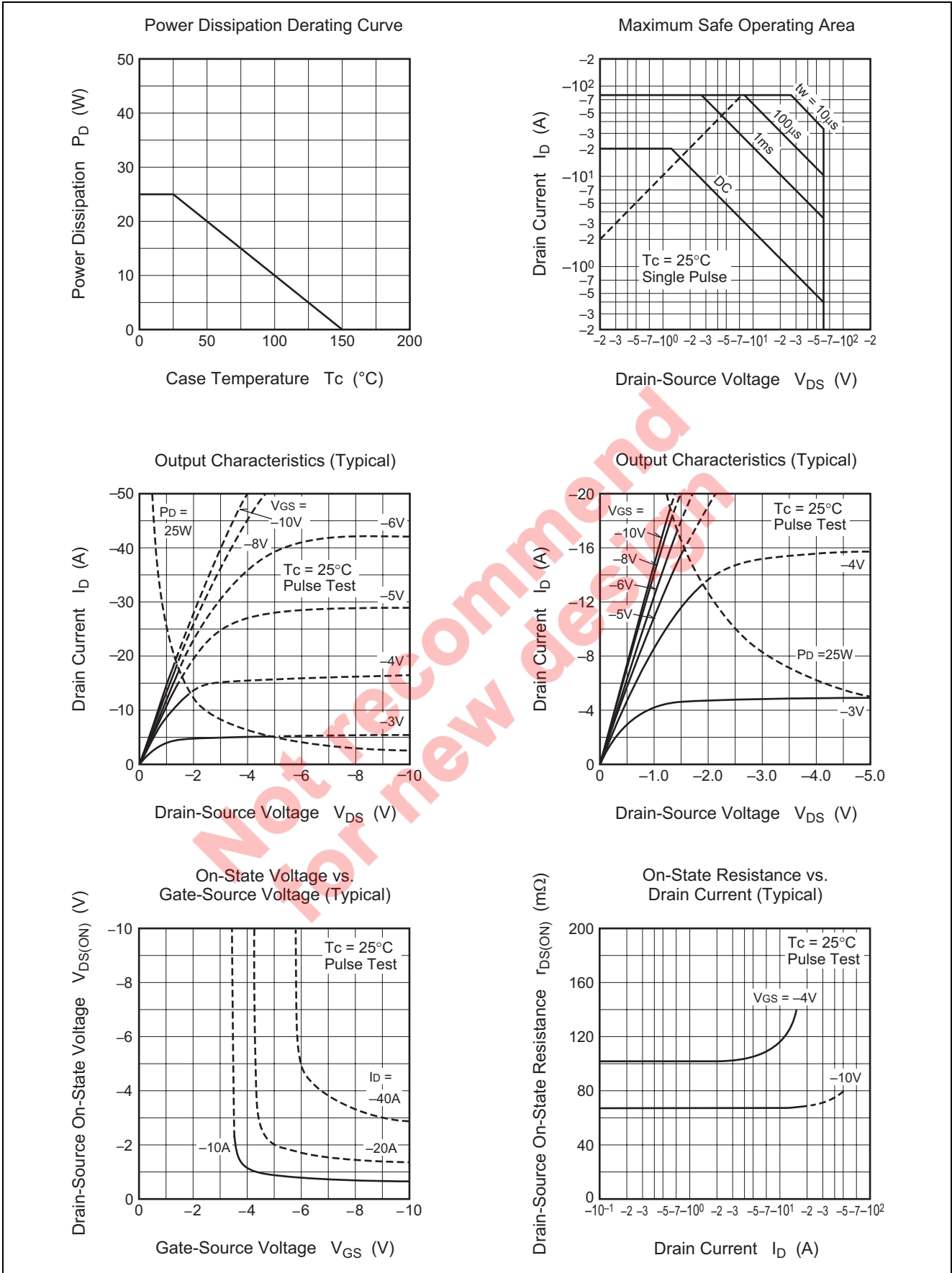
## Electrical Characteristics

(T<sub>ch</sub> = 25°C)

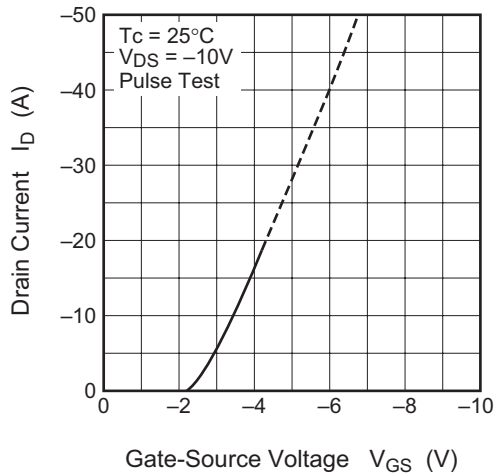
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	-60	—	—	V	I <sub>D</sub> = -1 mA, V <sub>GS</sub> = 0 V
Gate-source leakage current	I <sub>GSS</sub>	—	—	±0.1	μA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V
Drain-source leakage current	I <sub>DSS</sub>	—	—	-0.1	mA	V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V
Gate-source threshold voltage	V <sub>GS(th)</sub>	-1.3	-1.8	-2.3	V	I <sub>D</sub> = -1 mA, V <sub>DS</sub> = -10 V
Drain-source on-state resistance	r <sub>DS(ON)</sub>	—	73	97	mΩ	I <sub>D</sub> = -10 A, V <sub>GS</sub> = -10 V
Drain-source on-state resistance	r <sub>DS(ON)</sub>	—	119	166	mΩ	I <sub>D</sub> = -10 A, V <sub>GS</sub> = -4 V
Drain-source on-state voltage	V <sub>DS(ON)</sub>	—	-0.73	-0.97	V	I <sub>D</sub> = -10 A, V <sub>GS</sub> = -10 V
Forward transfer admittance	y <sub>fs</sub>	—	10.9	—	S	I <sub>D</sub> = -10 A, V <sub>DS</sub> = -10 V
Input capacitance	C <sub>iss</sub>	—	2370	—	pF	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = 0 V, f = 1MHz
Output capacitance	C <sub>oss</sub>	—	306	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	147	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	15	—	ns	V <sub>DD</sub> = -30 V, I <sub>D</sub> = -10 A, V <sub>GS</sub> = -10 V, R <sub>GEN</sub> = R <sub>GS</sub> = 50 Ω
Rise time	t <sub>r</sub>	—	37	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	131	—	ns	
Fall time	t <sub>f</sub>	—	72	—	ns	
Source-drain voltage	V <sub>SD</sub>	—	-1.0	-1.5	V	I <sub>S</sub> = -10 A, V <sub>GS</sub> = 0 V
Thermal resistance	R <sub>th(ch-c)</sub>	—	—	5.00	°C/W	Channel to case
Reverse recovery time	t <sub>rr</sub>	—	50	—	ns	I <sub>S</sub> = -20 A, d <sub>is</sub> /d <sub>t</sub> = 100 A/μs

Not recommended  
for new designs

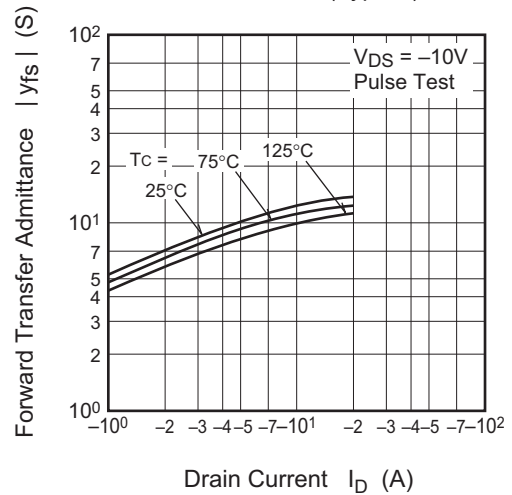
Performance Curves



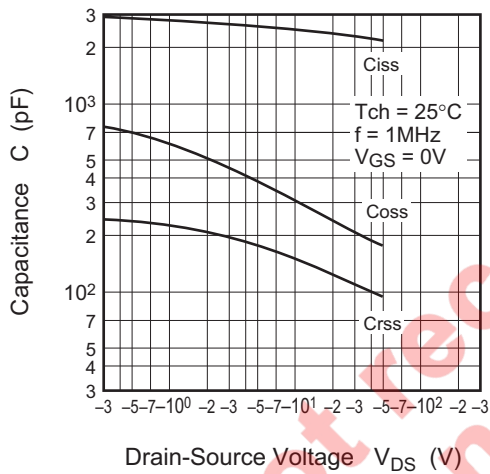
Transfer Characteristics (Typical)



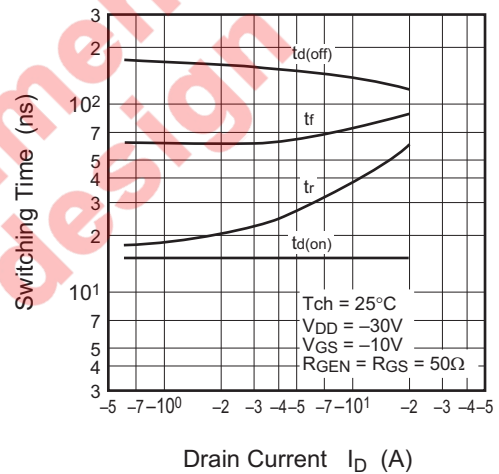
Forward Transfer Admittance vs. Drain Current (Typical)



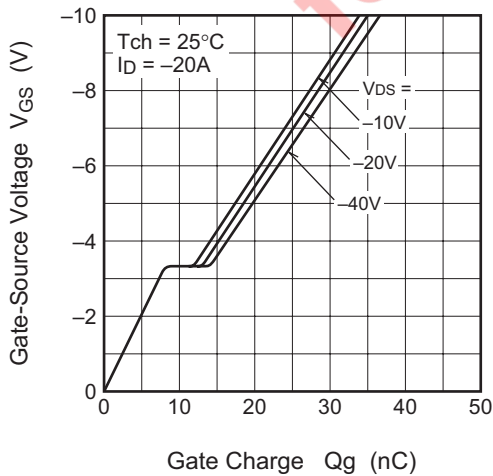
Capacitance vs. Drain-Source Voltage (Typical)



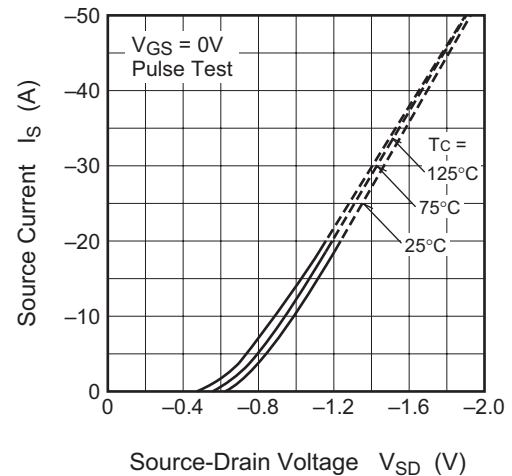
Switching Characteristics (Typical)

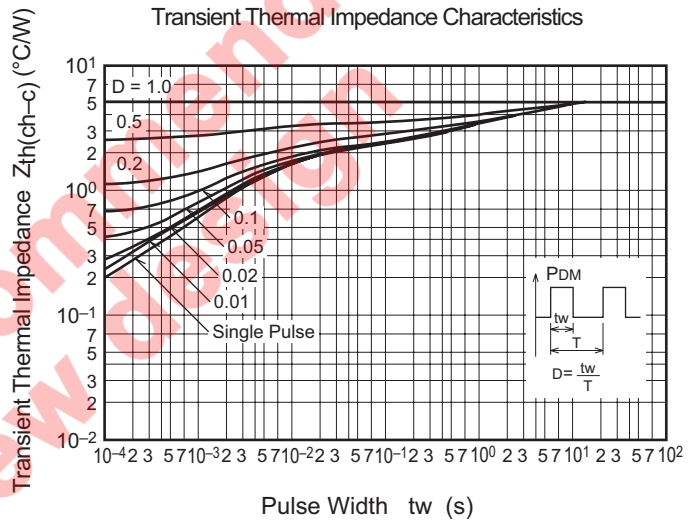
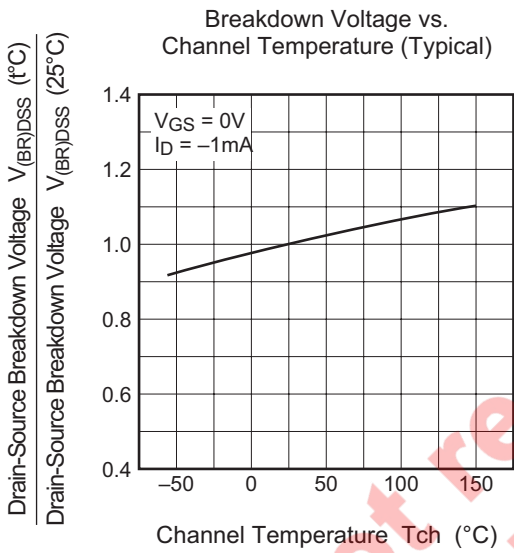
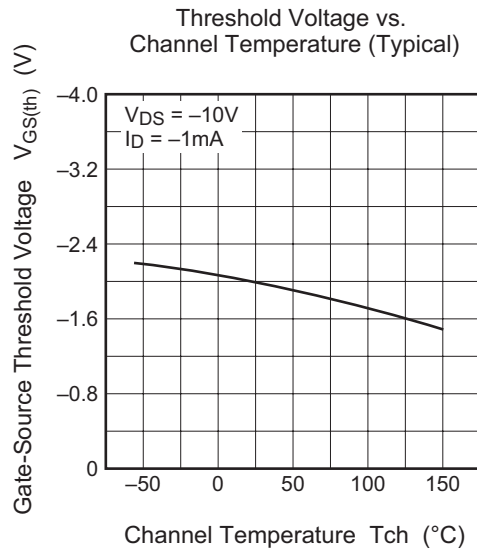
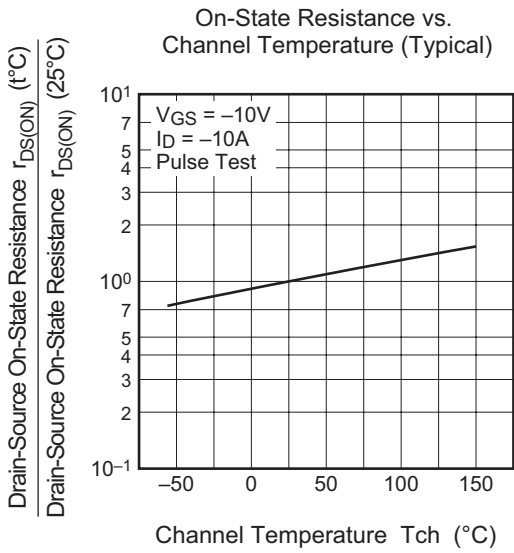


Gate-Source Voltage vs. Gate Charge (Typical)

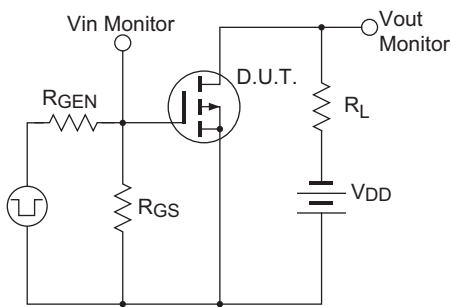


Source-Drain Diode Forward Characteristics (Typical)

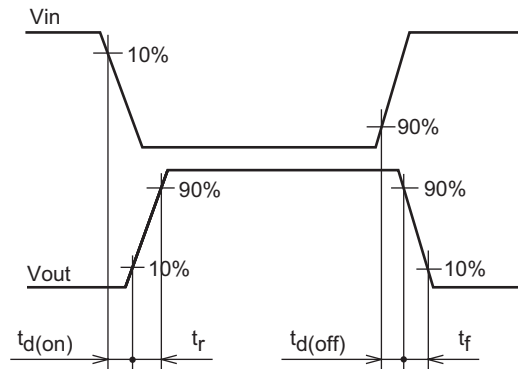




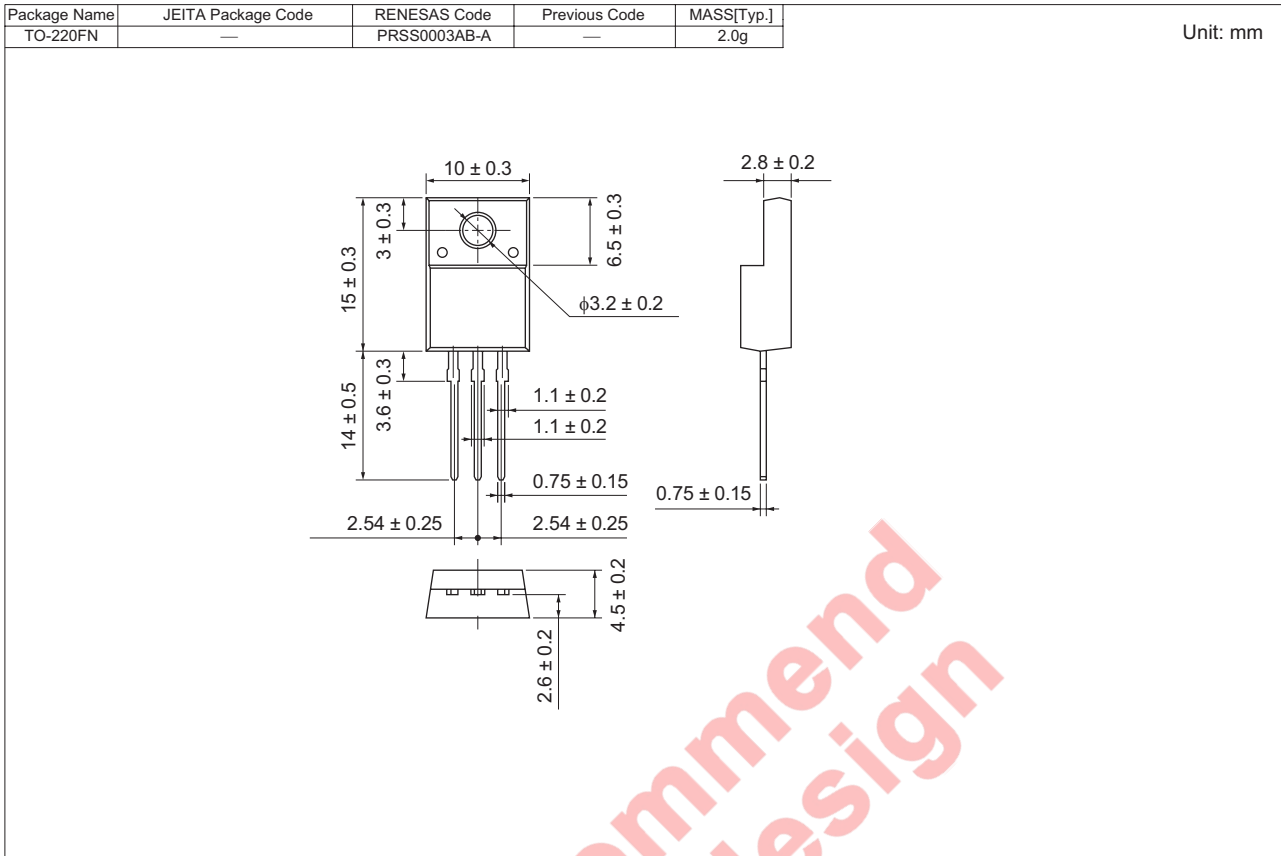
Switching Time Measurement Circuit



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	FX20KMJ-06
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FX20KMJ-06-A8

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

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