

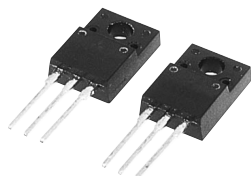
**PRELIMINARY**  
 Notice: This is not a final specification.  
 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

**FX3KMJ-3**

HIGH-SPEED SWITCHING USE

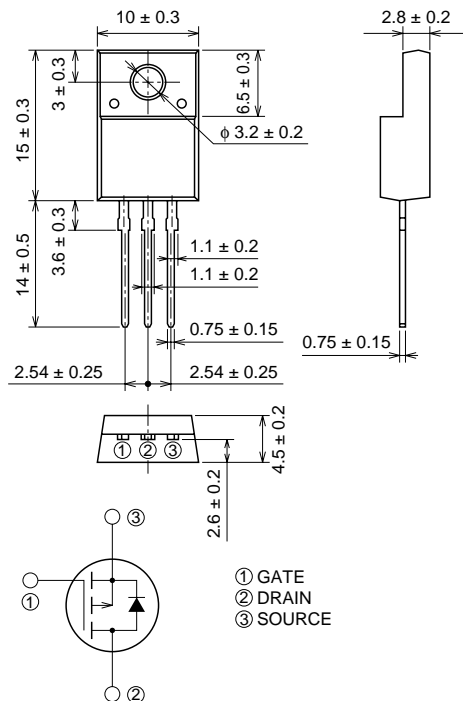
# FX3KMJ-3



- 4V DRIVE
- $V_{DS}$  ..... -150V
- $r_{DS(ON)}(MAX)$  .....  $1.2\Omega$
- $I_D$  ..... -3A
- Integrated Fast Recovery Diode (TYP.) ..... 80ns
- $V_{iso}$  ..... 2000V

## OUTLINE DRAWING

Dimensions in mm



TO-220FN

## APPLICATION

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

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

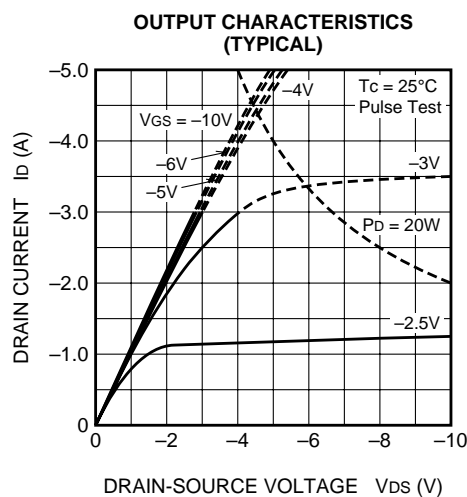
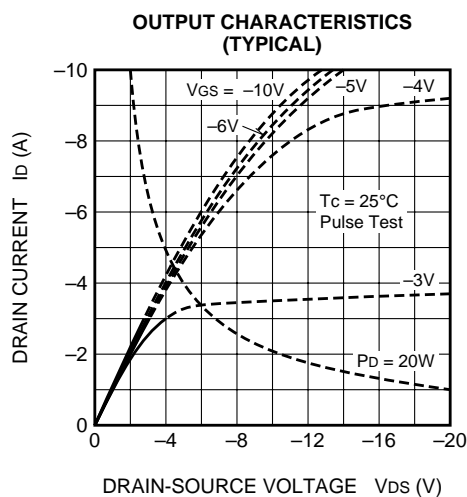
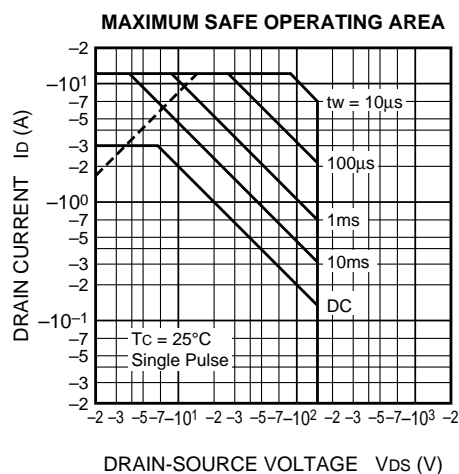
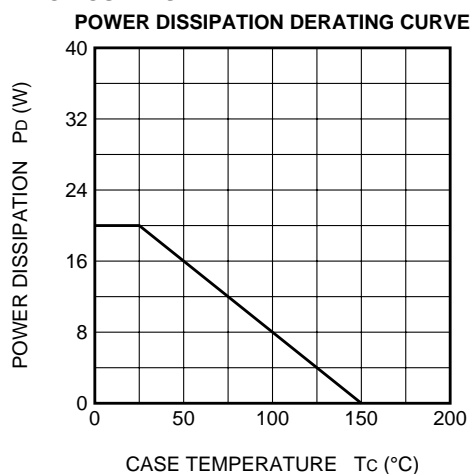
Symbol	Parameter	Conditions	Ratings	Unit
$V_{DS}$	Drain-source voltage	$V_{GS} = 0V$	-150	V
$V_{GSS}$	Gate-source voltage	$V_{DS} = 0V$	$\pm 20$	V
$I_D$	Drain current		-3	A
$I_{DM}$	Drain current (Pulsed)		-12	A
$I_{DA}$	Avalanche drain current (Pulsed)	$L = 100\mu H$	-3	A
$I_S$	Source current		-3	A
$I_{SM}$	Source current (Pulsed)		-12	A
$P_D$	Maximum power dissipation		20	W
$T_{ch}$	Channel temperature		$-55 \sim +150$	$^\circ\text{C}$
$T_{stg}$	Storage temperature		$-55 \sim +150$	$^\circ\text{C}$
$V_{iso}$	Isolation voltage	AC for 1minute, Terminal to case	2000	V
—	Weight	Typical value	2.0	g

Jan.1999

**ELECTRICAL CHARACTERISTICS** ( $T_{ch} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = -1\text{mA}$ , $V_{GS} = 0\text{V}$	-150	—	—	V
$I_{GSS}$	Gate-source leakage current	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$	—	—	$\pm 0.1$	$\mu\text{A}$
$I_{DSS}$	Drain-source leakage current	$V_{DS} = -150\text{V}$ , $V_{GS} = 0\text{V}$	—	—	-0.1	mA
$V_{GS(th)}$	Gate-source threshold voltage	$I_D = -1\text{mA}$ , $V_{DS} = -10\text{V}$	-1.0	-1.5	-2.0	V
$r_{DS(on)}$	Drain-source on-state resistance	$I_D = -1\text{A}$ , $V_{GS} = -10\text{V}$	—	0.93	1.20	$\Omega$
$r_{DS(on)}$	Drain-source on-state resistance	$I_D = -1\text{A}$ , $V_{GS} = -4\text{V}$	—	1.02	1.32	$\Omega$
$V_{DS(on)}$	Drain-source on-state voltage	$I_D = -1\text{A}$ , $V_{GS} = -10\text{V}$	—	-0.93	-1.20	V
$ y_{fs} $	Forward transfer admittance	$I_D = -1\text{A}$ , $V_{DS} = -5\text{V}$	—	3.0	—	S
$C_{iss}$	Input capacitance	$V_{DS} = -10\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$	—	1170	—	pF
$C_{oss}$	Output capacitance		—	81	—	pF
$C_{rss}$	Reverse transfer capacitance		—	31	—	pF
$t_d(on)$	Turn-on delay time	$V_{DD} = -80\text{V}$ , $I_D = -1\text{A}$ , $V_{GS} = -10\text{V}$ , $R_{GEN} = R_{GS} = 50\Omega$	—	9	—	ns
$t_r$	Rise time		—	7	—	ns
$t_d(off)$	Turn-off delay time		—	82	—	ns
$t_f$	Fall time		—	33	—	ns
$V_{SD}$	Source-drain voltage	$I_S = -1\text{A}$ , $V_{GS} = 0\text{V}$	—	-1.0	-1.5	V
$R_{th(ch-c)}$	Thermal resistance	Channel to case	—	—	6.25	$^{\circ}\text{C/W}$
$t_{rr}$	Reverse recovery time	$I_S = -3\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$	—	80	—	ns

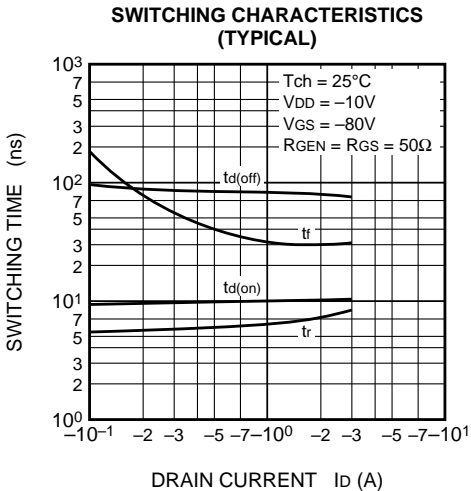
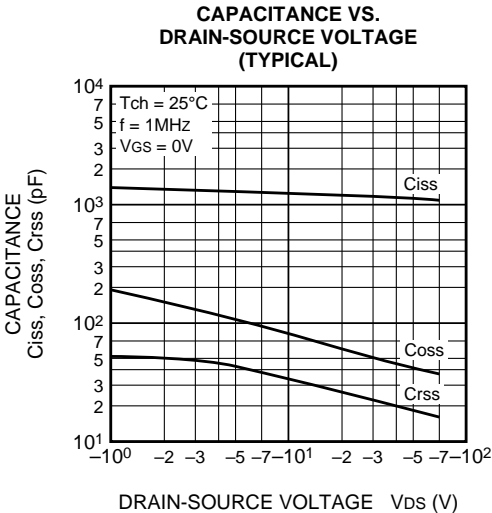
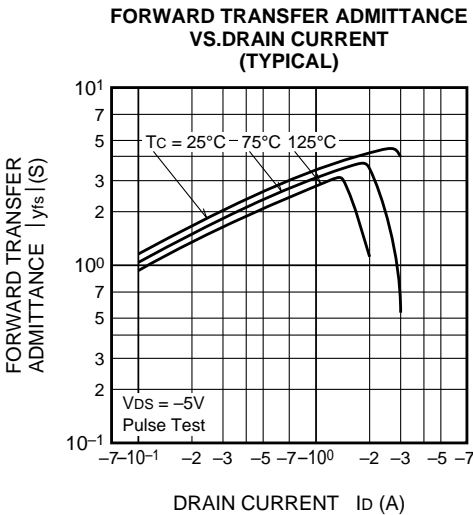
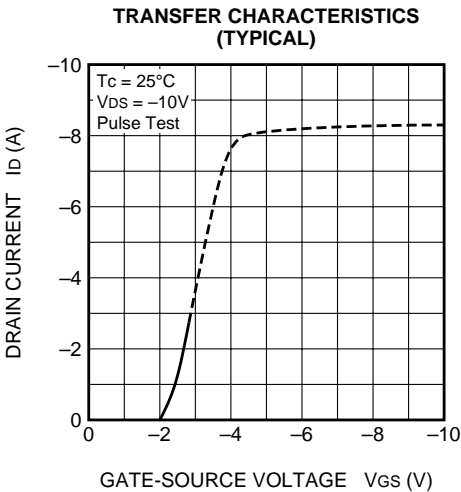
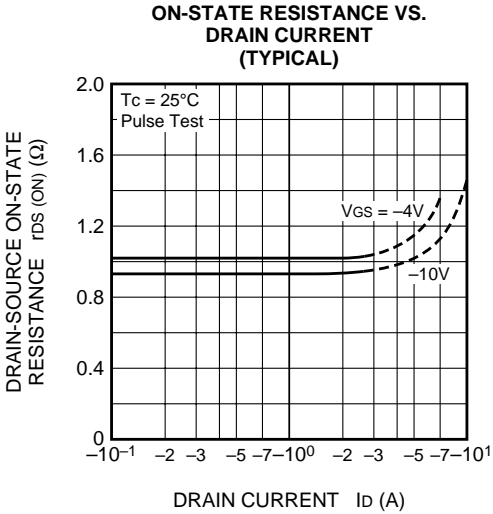
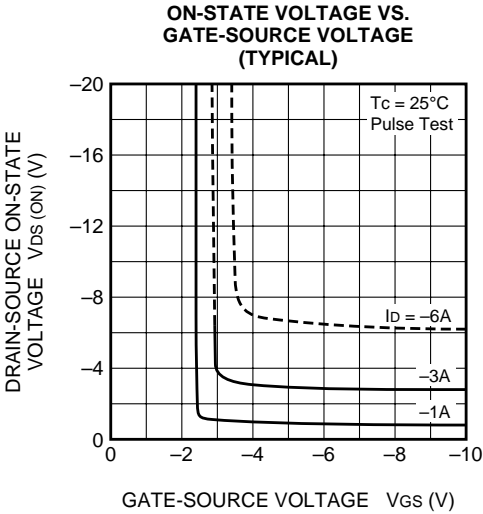
**PERFORMANCE CURVES**



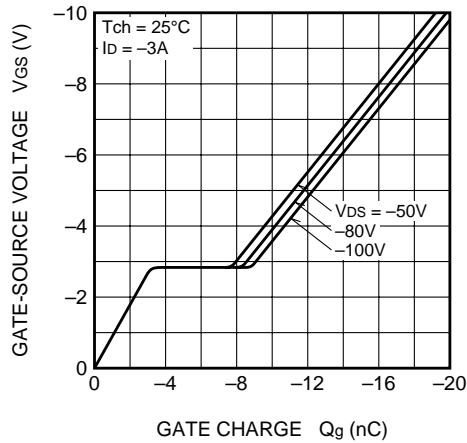
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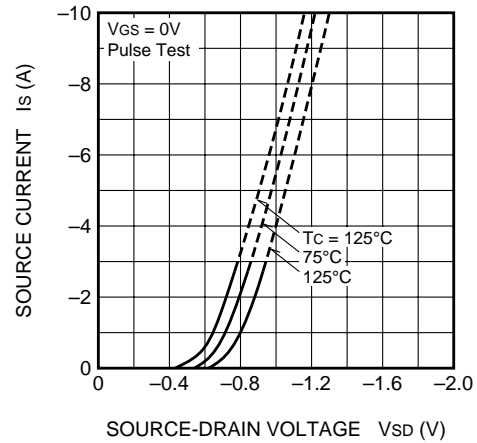
HIGH-SPEED SWITCHING USE



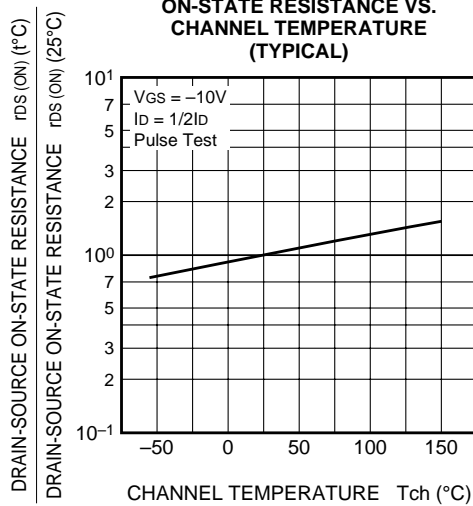
**GATE-SOURCE VOLTAGE  
VS. GATE CHARGE  
(TYPICAL)**



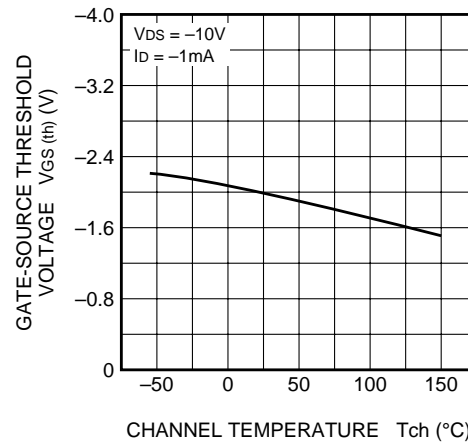
**SOURCE-DRAIN DIODE  
FORWARD CHARACTERISTICS  
(TYPICAL)**



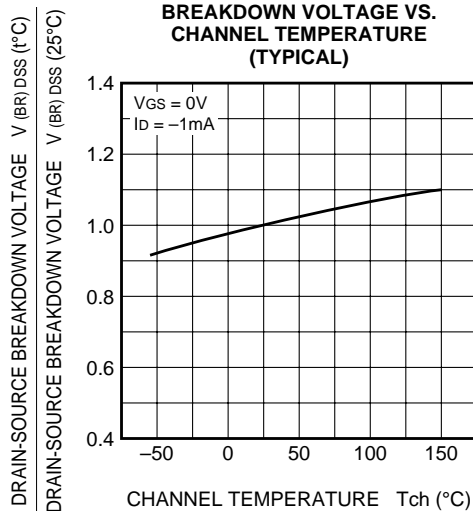
**ON-STATE RESISTANCE VS.  
CHANNEL TEMPERATURE  
(TYPICAL)**



**THRESHOLD VOLTAGE VS.  
CHANNEL TEMPERATURE  
(TYPICAL)**



**BREAKDOWN VOLTAGE VS.  
CHANNEL TEMPERATURE  
(TYPICAL)**



**TRANSIENT THERMAL IMPEDANCE  
CHARACTERISTICS**

