

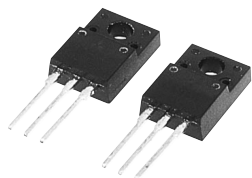
**PRELIMINARY**  
 Notice: This is not a final specification.  
 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

**FX20KMJ-3**

HIGH-SPEED SWITCHING USE

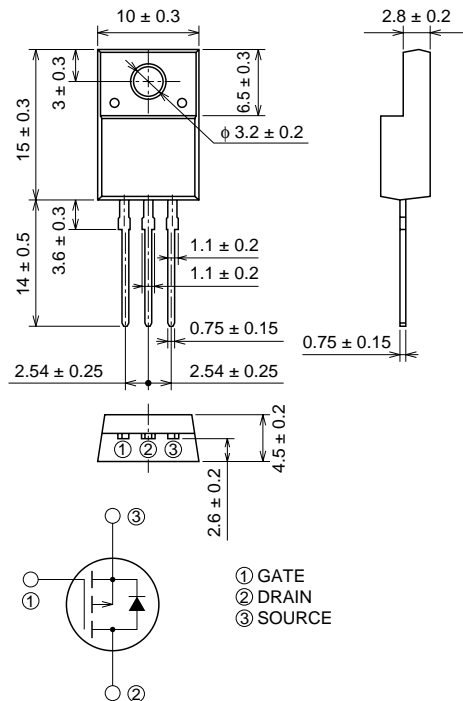
## FX20KMJ-3



- 4V DRIVE
- $V_{DS}$  ..... -150V
- $r_{DS(ON)}(MAX)$  .....  $0.29\Omega$
- $I_D$  ..... -20A
- Integrated Fast Recovery Diode (TYP.) ..... 100ns
- $V_{iso}$  ..... 2000V

## OUTLINE DRAWING

Dimensions in mm



TO-220FN

## APPLICATION

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

## MAXIMUM RATINGS (Tc = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
$V_{DS}$	Drain-source voltage	$V_{GS} = 0V$	-150	V
$V_{GSS}$	Gate-source voltage	$V_{DS} = 0V$	±20	V
$I_D$	Drain current		-20	A
$I_{DM}$	Drain current (Pulsed)		-80	A
$I_{DA}$	Avalanche drain current (Pulsed)	$L = 30\mu H$	-20	A
$I_S$	Source current		-20	A
$I_{SM}$	Source current (Pulsed)		-80	A
$P_D$	Maximum power dissipation		30	W
$T_{ch}$	Channel temperature		-55 ~ +150	°C
$T_{stg}$	Storage temperature		-55 ~ +150	°C
$V_{iso}$	Isolation voltage	AC for 1minute, Terminal to case	2000	V
—	Weight	Typical value	2.0	g

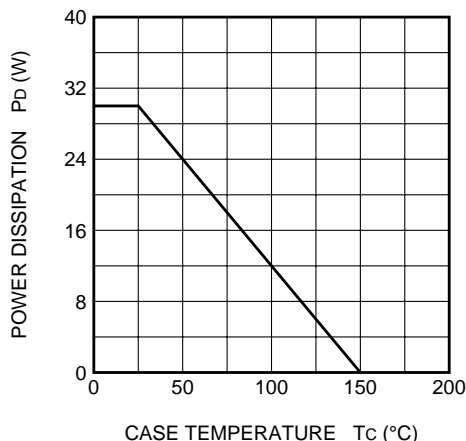
Jan.1999

**ELECTRICAL CHARACTERISTICS** (Tch = 25°C)

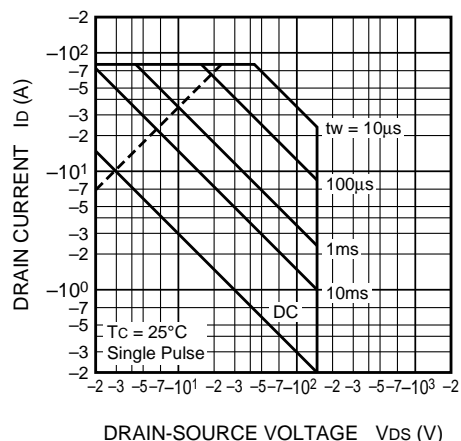
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V (BR) DSS	Drain-source breakdown voltage	Id = -1mA, VGS = 0V	-150	—	—	V
IGSS	Gate-source leakage current	VGS = ±20V, VDS = 0V	—	—	±0.1	μA
IDSS	Drain-source leakage current	VDS = -150V, VGS = 0V	—	—	-0.1	mA
VGS (th)	Gate-source threshold voltage	Id = -1mA, VDS = -10V	-1.0	-1.5	-2.0	V
rDS (ON)	Drain-source on-state resistance	Id = -10A, VGS = -10V	—	0.23	0.29	Ω
rDS (ON)	Drain-source on-state resistance	Id = -10A, VGS = -4V	—	0.25	0.32	Ω
VDS (ON)	Drain-source on-state voltage	Id = -10A, VGS = -10V	—	-2.3	-2.9	V
yfs	Forward transfer admittance	Id = -10A, VDS = -10V	—	17.5	—	S
Ciss	Input capacitance	VDS = -10V, VGS = 0V, f = 1MHz	—	4470	—	pF
Coss	Output capacitance		—	248	—	pF
Crss	Reverse transfer capacitance		—	115	—	pF
td (on)	Turn-on delay time	VDD = -80V, Id = -10A, VGS = -10V, RGEN = RGS = 50Ω	—	15	—	ns
tr	Rise time		—	42	—	ns
td (off)	Turn-off delay time		—	273	—	ns
tf	Fall time		—	114	—	ns
VSD	Source-drain voltage	IS = -10A, VGS = 0V	—	-1.0	-1.5	V
Rth (ch-c)	Thermal resistance	Channel to case	—	—	4.17	°C/W
trr	Reverse recovery time	IS = -20A, dis/dt = 100A/μs	—	100	—	ns

**PERFORMANCE CURVES**

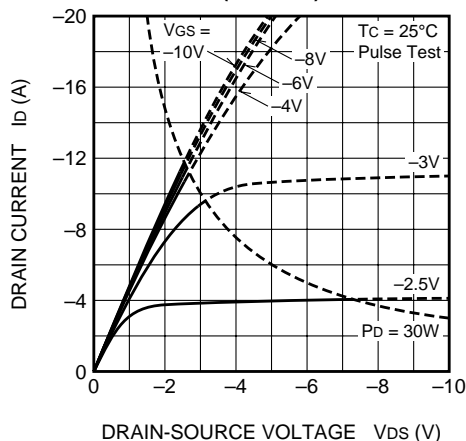
**POWER DISSIPATION DERATING CURVE**



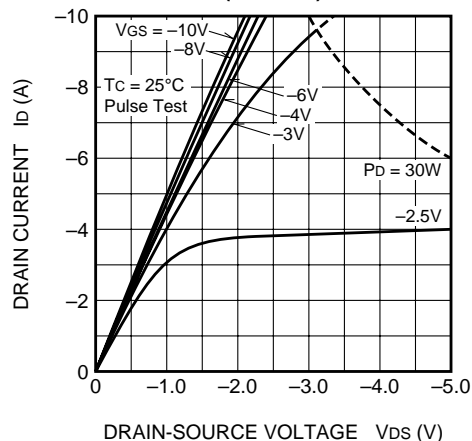
**MAXIMUM SAFE OPERATING AREA**



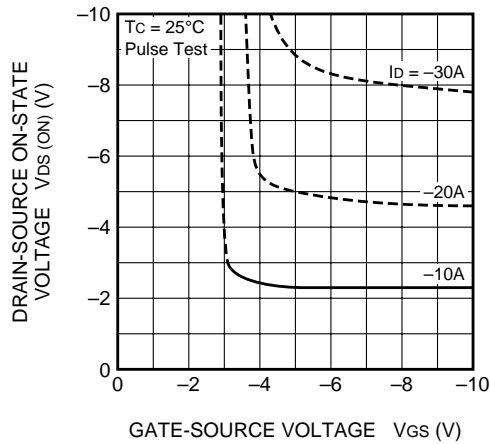
**OUTPUT CHARACTERISTICS (TYPICAL)**



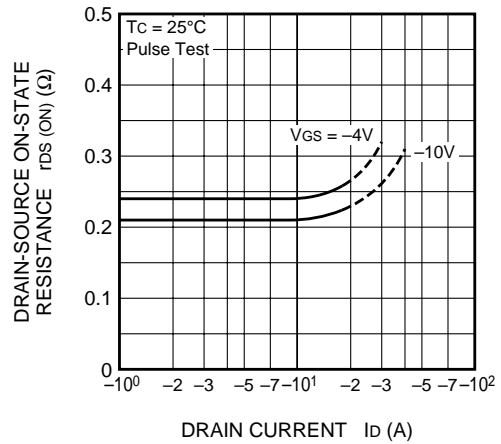
**OUTPUT CHARACTERISTICS (TYPICAL)**



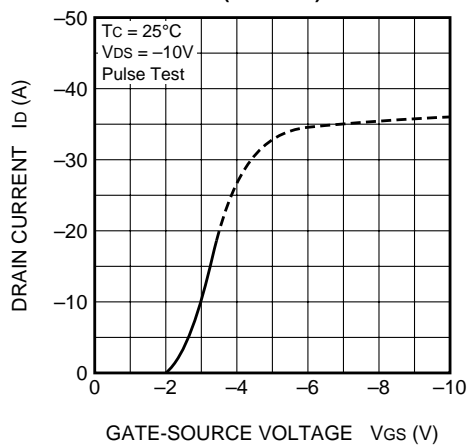
**ON-STATE VOLTAGE VS.  
GATE-SOURCE VOLTAGE  
(TYPICAL)**



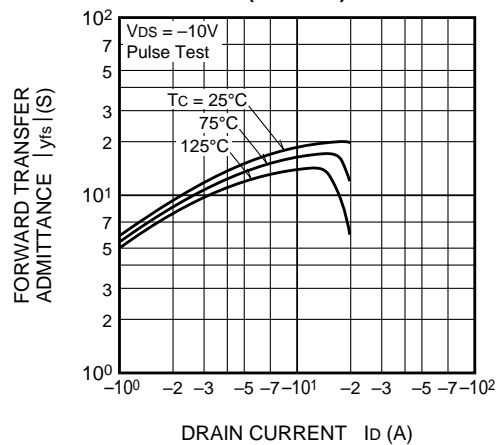
**ON-STATE RESISTANCE VS.  
DRAIN CURRENT  
(TYPICAL)**



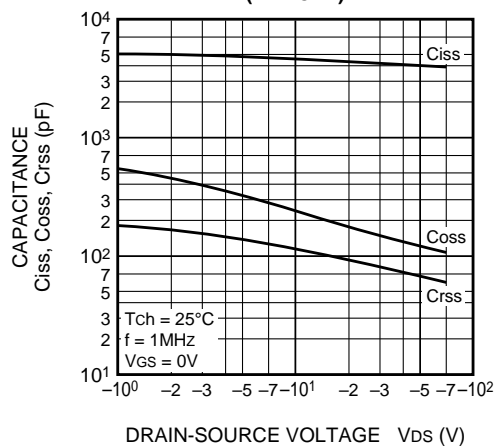
**TRANSFER CHARACTERISTICS  
(TYPICAL)**



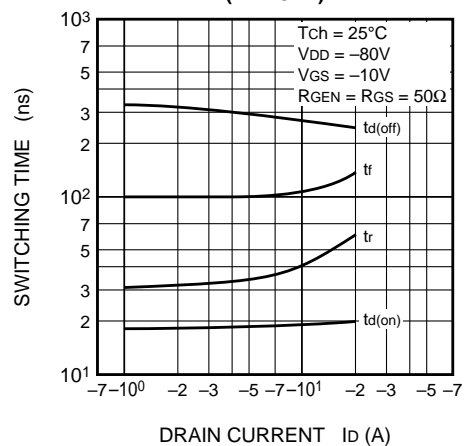
**FORWARD TRANSFER ADMITTANCE  
VS. DRAIN CURRENT  
(TYPICAL)**



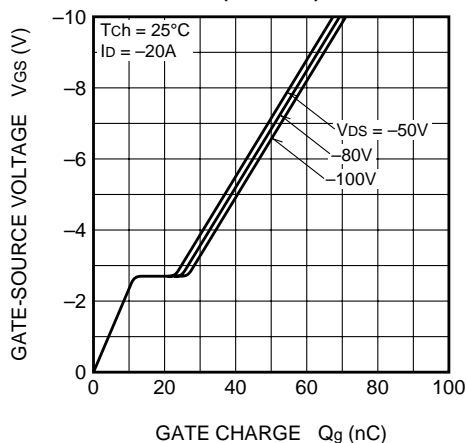
**CAPACITANCE VS.  
DRAIN-SOURCE VOLTAGE  
(TYPICAL)**



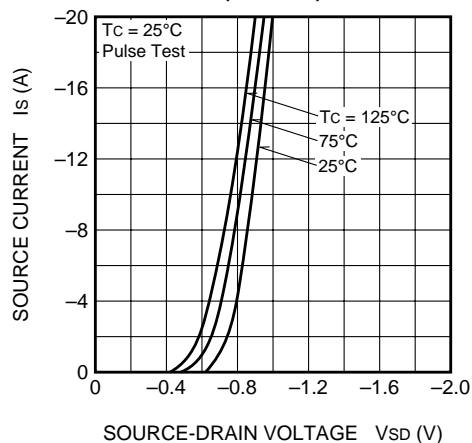
**SWITCHING CHARACTERISTICS  
(TYPICAL)**



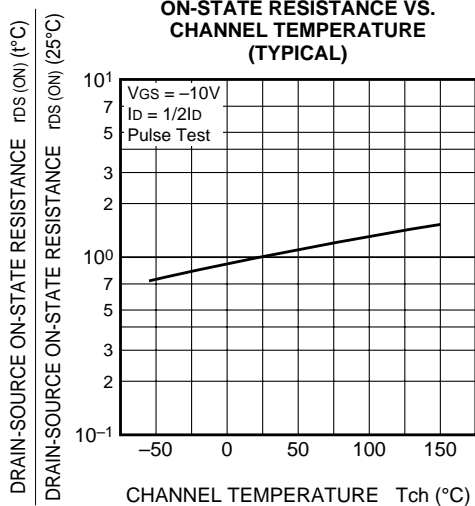
**GATE-SOURCE VOLTAGE  
VS. GATE CHARGE  
(TYPICAL)**



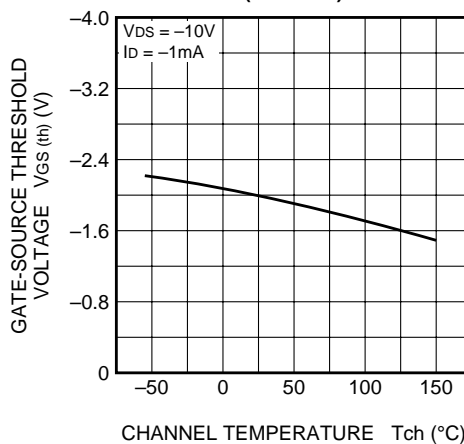
**SOURCE-DRAIN DIODE  
FORWARD CHARACTERISTICS  
(TYPICAL)**



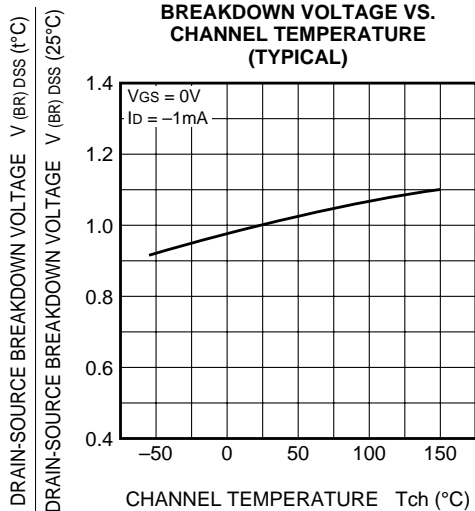
**ON-STATE RESISTANCE VS.  
CHANNEL TEMPERATURE  
(TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE  
CHARACTERISTICS**

