

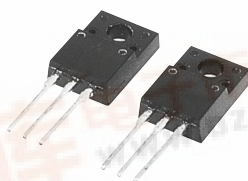
PRELIMINARY
Notice: This is not a final specification.
Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX50KMJ-03

HIGH-SPEED SWITCHING USE

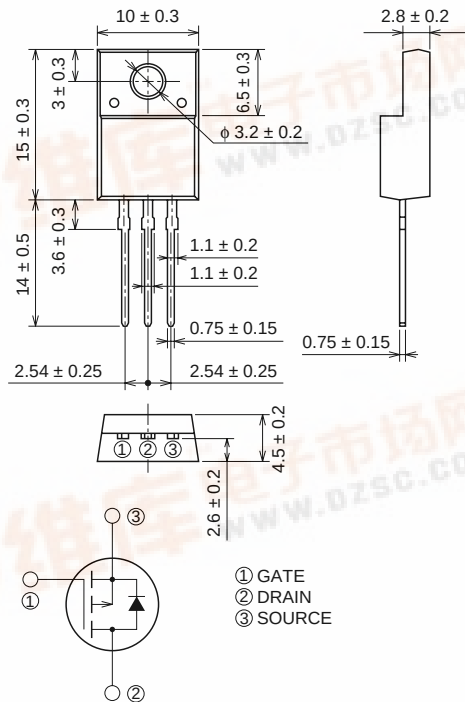
FX50KMJ-03



- 4V DRIVE
- V_{DS} -30V
- $r_{DS(ON)}(MAX)$ 35m Ω
- I_D -50A
- Integrated Fast Recovery Diode (TYP.) 55ns
- 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)

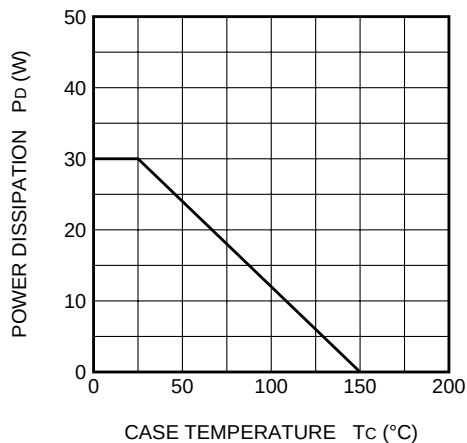
Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	-30	V
V_{GS}	Gate-source voltage	$V_{DS} = 0V$	±20	V
I_D	Drain current		-50	A
I_{DM}	Drain current (Pulsed)		-200	A
I_{DA}	Avalanche drain current (Pulsed)	$L = 10\mu H$	-50	A
I_S	Source current		-50	A
I_{SM}	Source current (Pulsed)		-200	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

ELECTRICAL CHARACTERISTICS (Tch = 25°C)

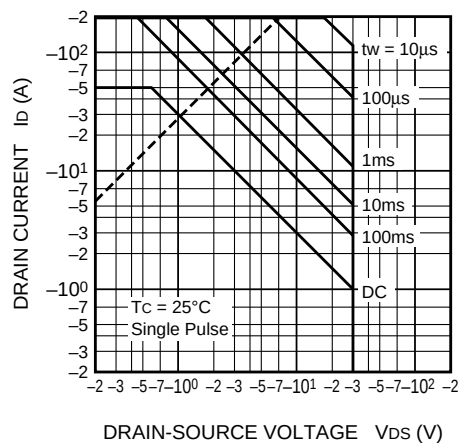
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V(BR)DSS	Drain-source breakdown voltage	Id = -1mA, VDs = 0V	-30	—	—	V
IGSS	Gate-source leakage current	VGS = ±20V, VDS = 0V	—	—	±0.1	μA
IDSS	Drain-source leakage current	VDS = -30V, VGS = 0V	—	—	-0.1	mA
VGS(th)	Gate-source threshold voltage	Id = -1mA, VDS = -10V	-1.3	-1.8	-2.3	V
rDS(ON)	Drain-source on-state resistance	Id = -25A, VGS = -10V	—	28	35	mΩ
rDS(ON)	Drain-source on-state resistance	Id = -9A, VGS = -4V	—	54	72	mΩ
VDs(ON)	Drain-source on-state voltage	Id = -25A, VGS = -10V	—	-0.70	-0.88	V
yfs	Forward transfer admittance	Id = -25A, VDS = -10V	—	23	—	S
Ciss	Input capacitance	VDS = -10V, VGS = 0V, f = 1MHz	—	4270	—	pF
Coss	Output capacitance		—	695	—	pF
Crss	Reverse transfer capacitance		—	342	—	pF
td(on)	Turn-on delay time	VDD = -15V, Id = -25A, VGS = -10V, RGEN = RGS = 50Ω	—	21	—	ns
tr	Rise time		—	103	—	ns
td(off)	Turn-off delay time		—	223	—	ns
tf	Fall time		—	122	—	ns
VSD	Source-drain voltage	Is = -25A, VGS = 0V	—	-1.0	-1.5	V
Rth(ch-c)	Thermal resistance	Channel to case	—	—	4.17	°C/W
trr	Reverse recovery time	Is = -25A, dis/dt = 50A/μs	—	55	—	ns

PERFORMANCE CURVES

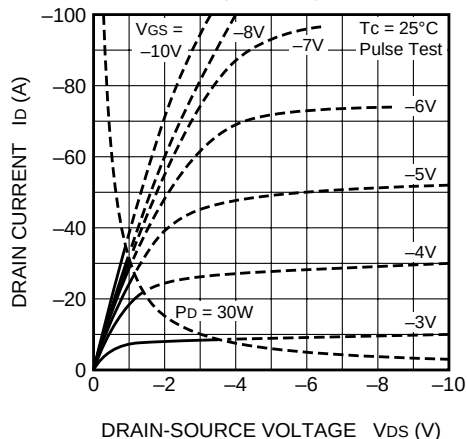
POWER DISSIPATION DERATING CURVE



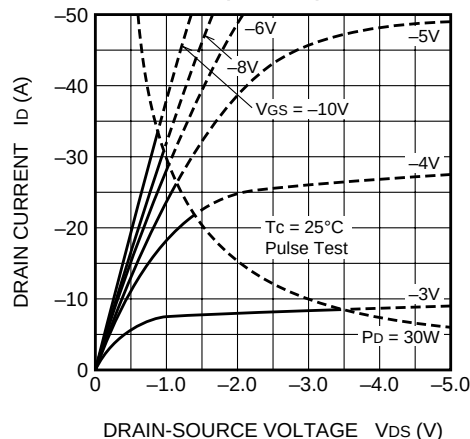
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)



OUTPUT CHARACTERISTICS (TYPICAL)



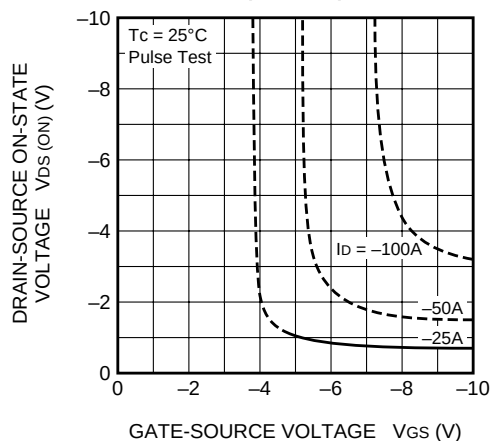
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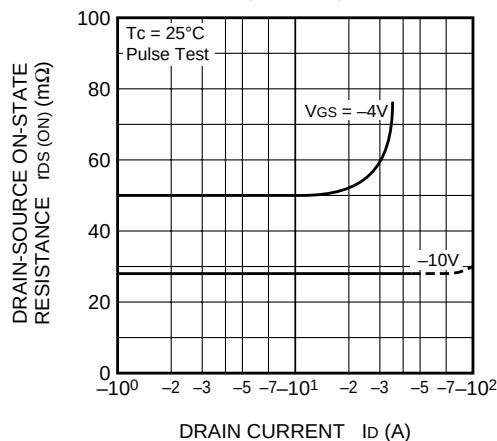
FX50KMJ-03

HIGH-SPEED SWITCHING USE

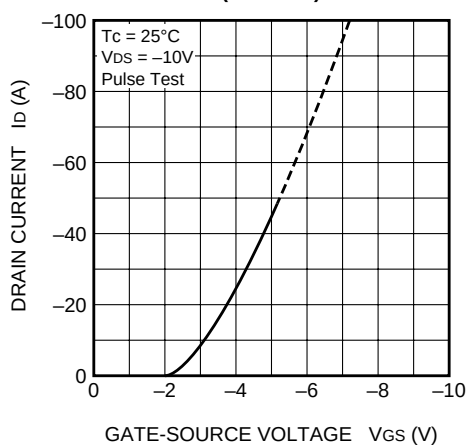
**ON-STATE VOLTAGE VS.
GATE-SOURCE VOLTAGE
(TYPICAL)**



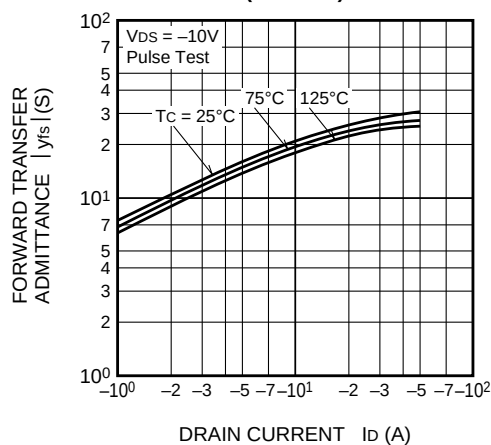
**ON-STATE RESISTANCE VS.
DRAIN CURRENT
(TYPICAL)**



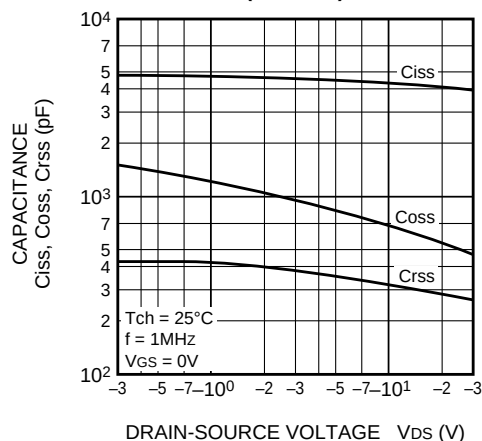
**TRANSFER CHARACTERISTICS
(TYPICAL)**



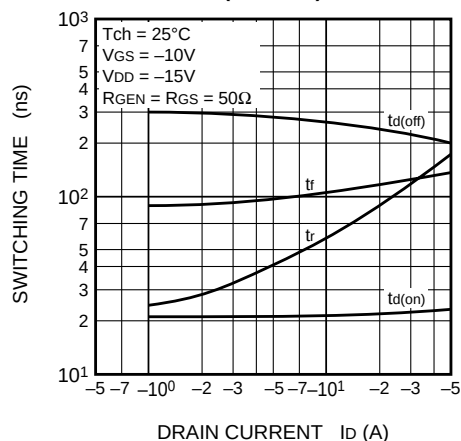
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT
(TYPICAL)**



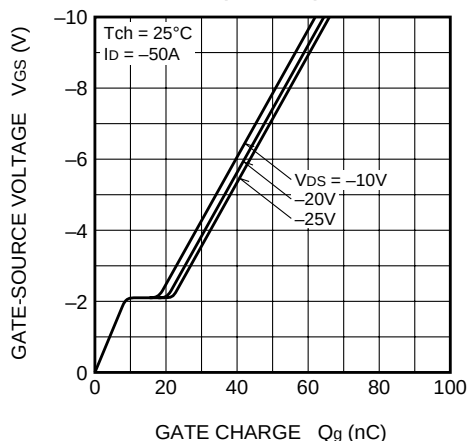
**CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE
(TYPICAL)**



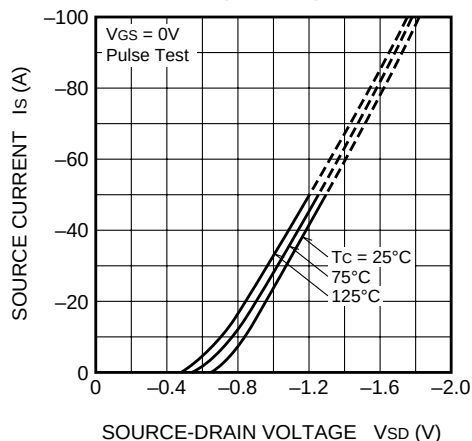
**SWITCHING CHARACTERISTICS
(TYPICAL)**



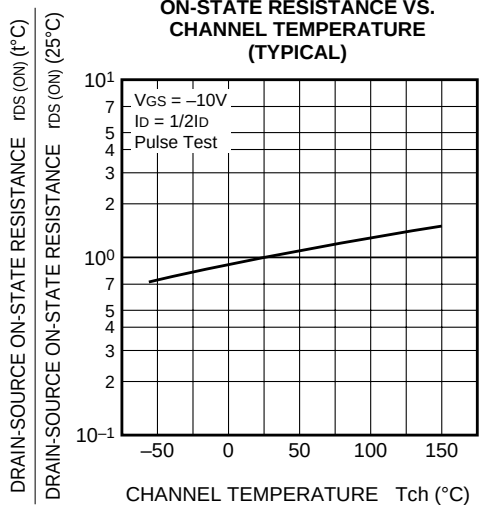
**GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)**



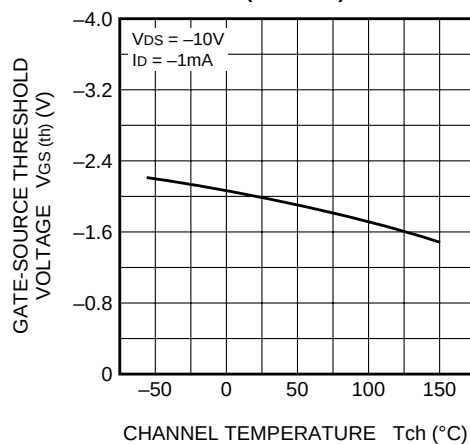
**SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)**



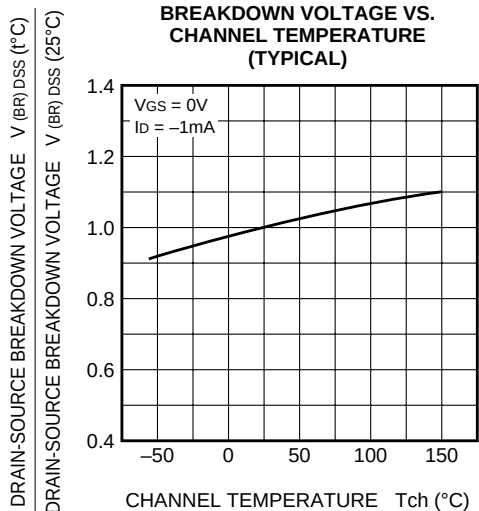
**ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS**

