PRELIMINARY

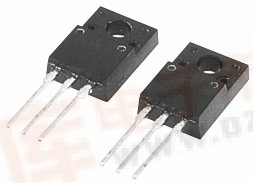
Notice: This is not a final specification.
Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX70KMJ-03

HIGH-SPEED SWITCHING USE

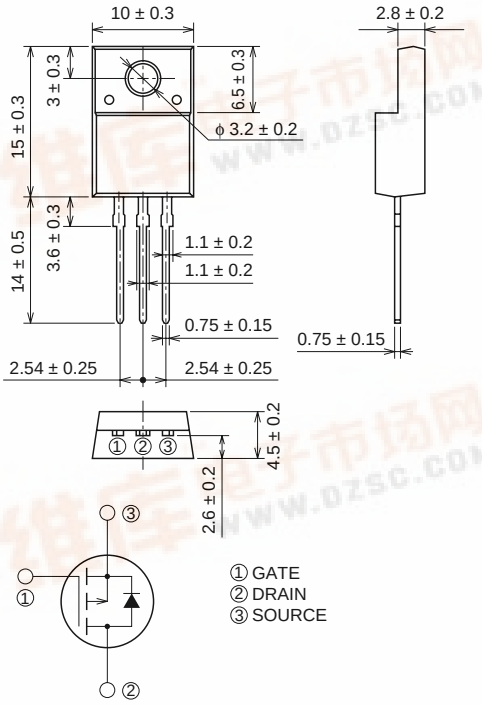
FX70KMJ-03



- 4V DRIVE
- VDSS ..... –30V
- rDS (ON) (MAX) 12.3mΩ
- ID ..... –70A
- Integrated Fast Recovery Diode (TYP.) 70ns
- Viso 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
VDSS	Drain-source voltage	VGS = 0V	–30	V
VGSS	Gate-source voltage	VDS = 0V	±20	V
ID	Drain current		–70	A
IDM	Drain current (Pulsed)		–280	A
IDA	Avalanche drain current (Pulsed)	L = 10µH	–70	A
IS	Source current		–70	A
ISM	Source current (Pulsed)		–280	A
PD	Maximum power dissipation		35	W
Tch	Channel temperature		–55 ~ +150	°C
Tstg	Storage temperature		–55 ~ +150	°C
Viso	Isolation voltage	AC for 1minute, Terminal to case	2000	V
—	Weight	Typical value	2.0	g

FX70KMJ-03

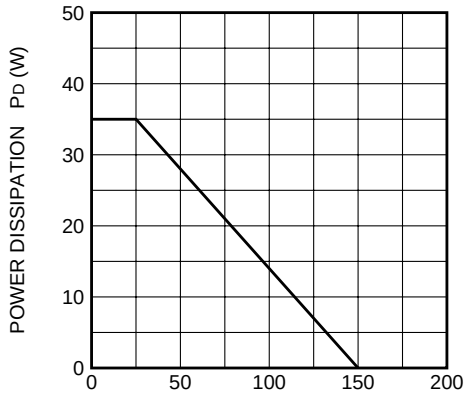
HIGH-SPEED SWITCHING USE

ELECTRICAL CHARACTERISTICS (Tch = 25°C)

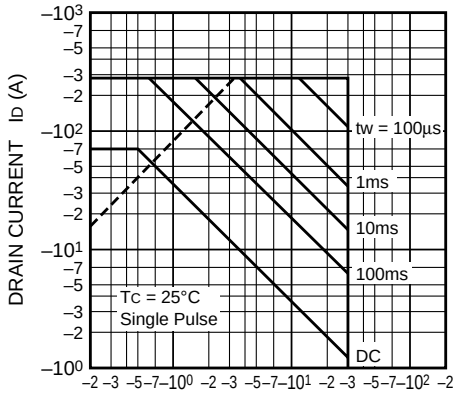
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)\ DSS}$	Drain-source breakdown voltage	I_D = –1mA, V_{DS} = 0V	–30	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±20V, V_{DS} = 0V	—	—	±0.1	µA
I_{DSS}	Drain-source leakage current	V_{DS} = –30V, V_{GS} = 0V	—	—	–0.1	mA
$V_{GS\ (th)}$	Gate-source threshold voltage	I_D = –1mA, V_{DS} = –10V	–1.3	–1.8	–2.3	V
$r_{DS\ (ON)}$	Drain-source on-state resistance	I_D = –35A, V_{GS} = –10V	—	10.0	12.3	mΩ
$r_{DS\ (ON)}$	Drain-source on-state resistance	I_D = –26A, V_{GS} = –4V	—	19	25	mΩ
$V_{DS\ (ON)}$	Drain-source on-state voltage	I_D = –35A, V_{GS} = –10V	—	–0.35	–0.43	V
$\lvert y_{fs} \rvert$	Forward transfer admittance	I_D = –35A, V_{DS} = –10V	—	55.8	—	S
C_{iss}	Input capacitance	V_{DS} = –10V, V_{GS} = 0V, f = 1MHz	—	11140	—	pF
C_{oss}	Output capacitance		—	2300	—	pF
C_{rss}	Reverse transfer capacitance		—	1000	—	pF
$t_{d\ (on)}$	Turn-on delay time	V_{DD} = –15V, I_D = –35A, V_{GS} = –10V, R_{GEN} = R_{GS} = 50Ω	—	85	—	ns
t_r	Rise time		—	228	—	ns
$t_{d\ (off)}$	Turn-off delay time		—	751	—	ns
t_f	Fall time		—	360	—	ns
V_{SD}	Source-drain voltage	I_S = –35A, V_{GS} = 0V	—	–1.0	–1.5	V
$R_{th\ (ch-c)}$	Thermal resistance	Channel to case	—	—	3.57	°C/W
t_{rr}	Reverse recovery time	I_S = –35A, dis/dt = 50A/µs	—	70	—	ns

PERFORMANCE CURVES

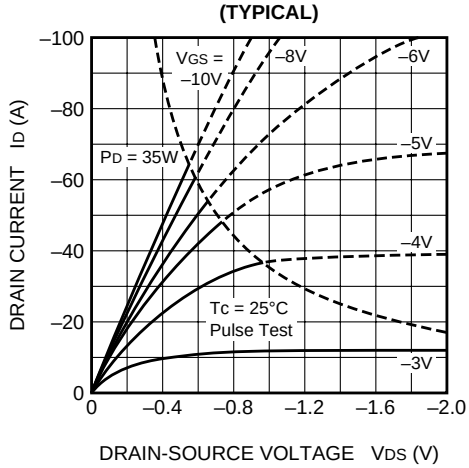
POWER DISSIPATION DERATING CURVE



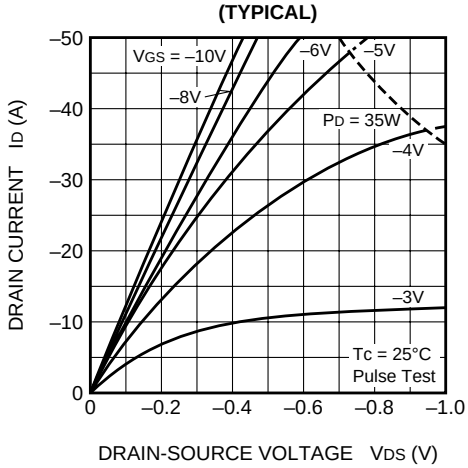
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)

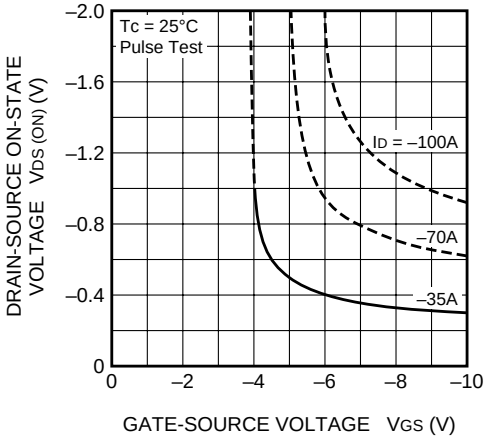


OUTPUT CHARACTERISTICS (TYPICAL)

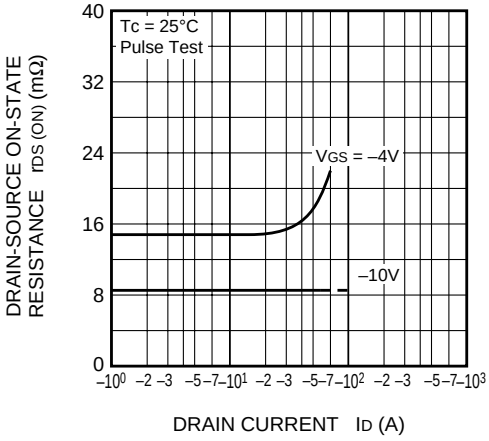


MITSUBISHI ELECTRIC

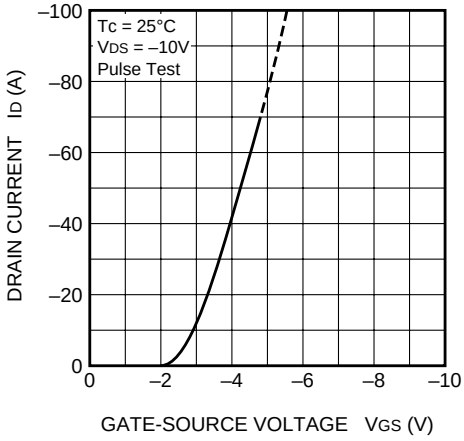
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



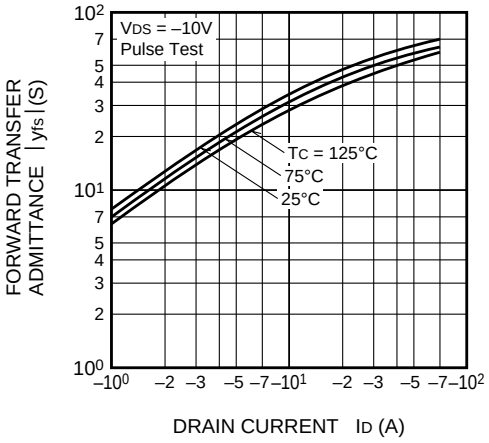
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



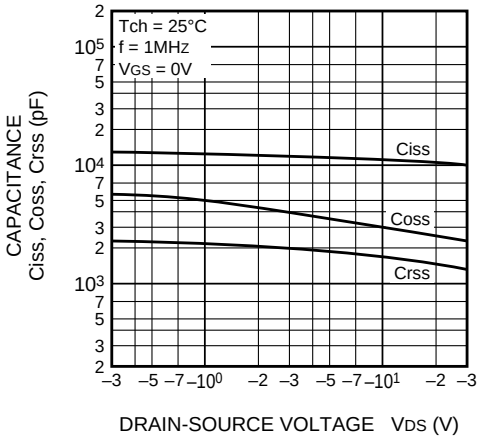
TRANSFER CHARACTERISTICS (TYPICAL)



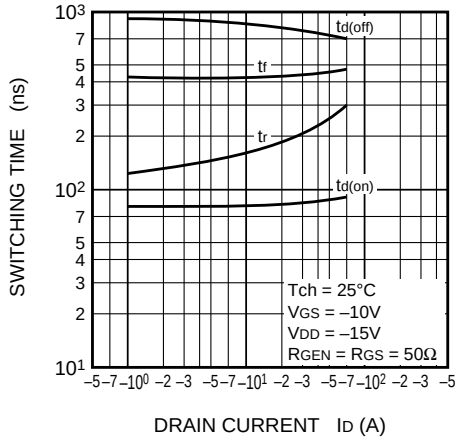
FORWARD TRANSFER ADMITTANCE VS.DRAIN CURRENT (TYPICAL)



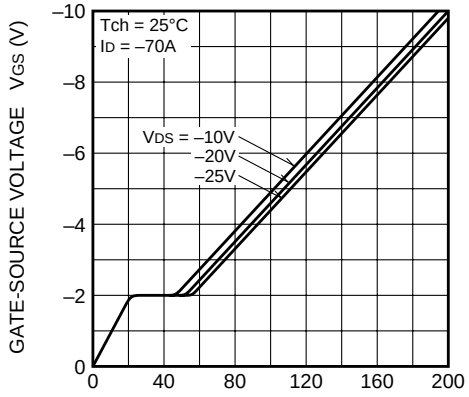
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



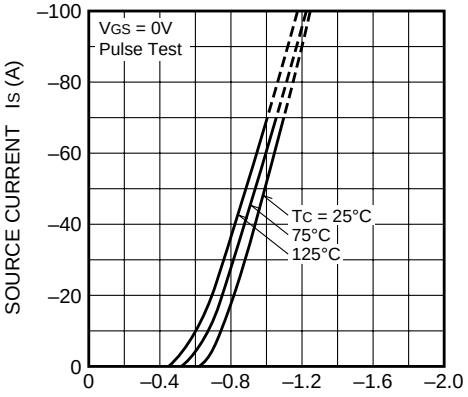
SWITCHING CHARACTERISTICS (TYPICAL)



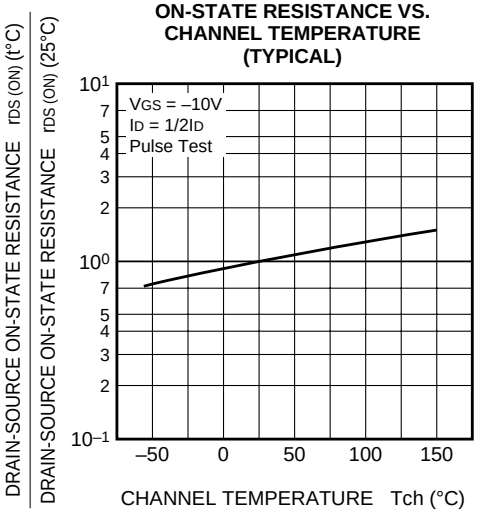
GATE-SOURCE VOLTAGE VS.GATE CHARGE (TYPICAL)



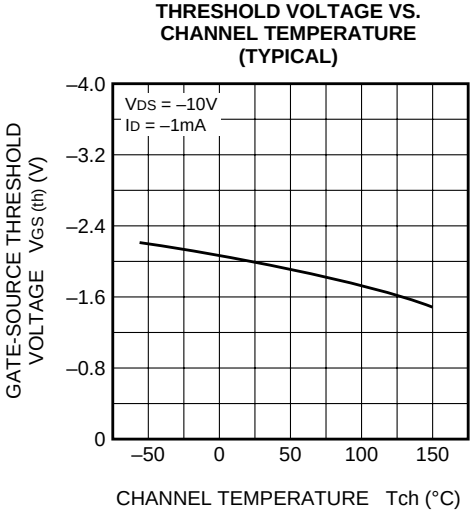
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



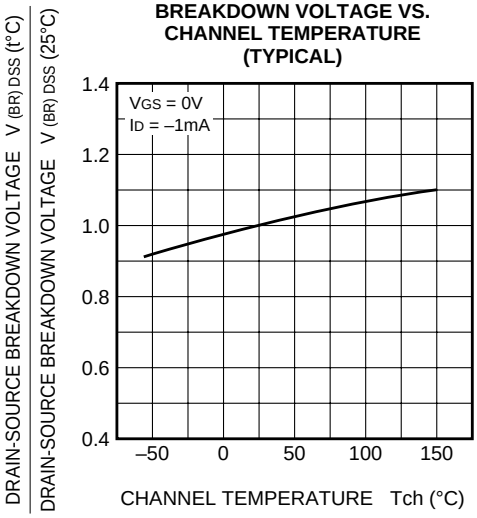
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS