

PRELIMINARY
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 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX50SMJ-06

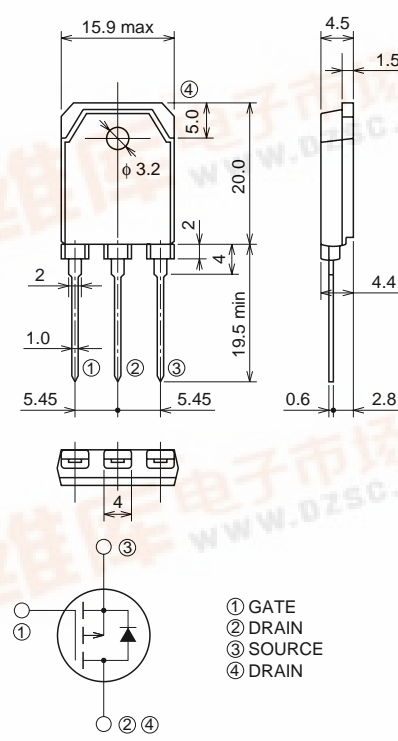
HIGH-SPEED SWITCHING USE

FX50SMJ-06



- 4V DRIVE
- V_{DSS} -60V
- $r_{DS(ON)}(MAX)$ 18.9m Ω
- I_D -50A
- Integrated Fast Recovery Diode (TYP.) 70ns

OUTLINE DRAWING Dimensions in mm



① GATE
 ② DRAIN
 ③ SOURCE
 ④ DRAIN

TO-3P

APPLICATION

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

MAXIMUM RATINGS (Tc = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DSS}	Drain-source voltage	$V_{GS} = 0V$	-60	V
V_{GSS}	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)	$L = 50\mu H$	-50	A
I_S	Source current		-50	A
I_{SM}	Source current (Pulsed)		-200	A
P_D	Maximum power dissipation		150	W
T_{ch}	Channel temperature		-55 ~ +150	°C
T_{stg}	Storage temperature		-55 ~ +150	°C
—	Weight	Typical value	4.8	g



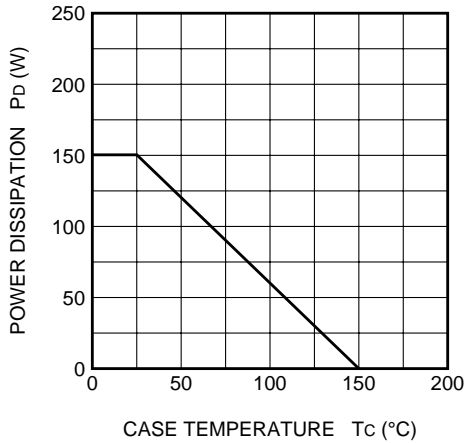
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ELECTRICAL CHARACTERISTICS (Tch = 25°C)

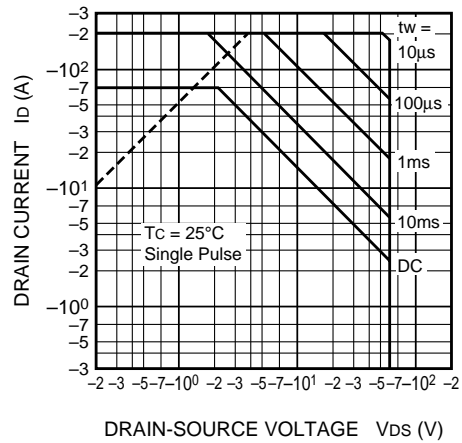
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V(BR)DSS	Drain-source breakdown voltage	Id = -1mA, VGS = 0V	-60	—	—	V
IGSS	Gate-source leakage current	VGS = ±20V, VDS = 0V	—	—	±0.1	μA
IDSS	Drain-source leakage current	VDS = -60V, VGS = 0V	—	—	-0.1	mA
VGS(th)	Gate-source threshold voltage	Id = -1mA, VDS = -10V	-1.3	-1.8	-2.3	V
rDS(ON)	Drain-source on-state resistance	Id = -25A, VGS = -10V	—	15.0	18.9	mΩ
rDS(ON)	Drain-source on-state resistance	Id = -25A, VGS = -4V	—	23	32	mΩ
VDS(ON)	Drain-source on-state voltage	Id = -25A, VGS = -10V	—	-0.38	-0.47	V
yfs	Forward transfer admittance	Id = -25A, VDS = -10V	—	49.1	—	S
Ciss	Input capacitance	VDS = -10V, VGS = 0V, f = 1MHz	—	11610	—	pF
Coss	Output capacitance		—	1355	—	pF
Crss	Reverse transfer capacitance		—	687	—	pF
td(on)	Turn-on delay time	VDD = -30V, Id = -25A, VGS = -10V, RGEN = RGS = 50Ω	—	73	—	ns
tr	Rise time		—	137	—	ns
td(off)	Turn-off delay time		—	822	—	ns
tf	Fall time		—	320	—	ns
VSD	Source-drain voltage	Is = -25A, VGS = 0V	—	-1.0	-1.5	V
Rth(ch-c)	Thermal resistance	Channel to case	—	—	0.83	°C/W
trr	Reverse recovery time	Is = -50A, dis/dt = 100A/μs	—	70	—	ns

PERFORMANCE CURVES

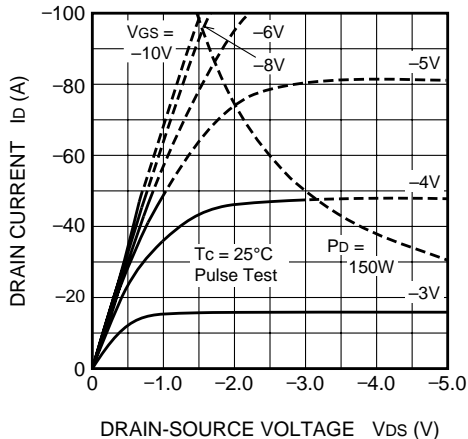
POWER DISSIPATION DERATING CURVE



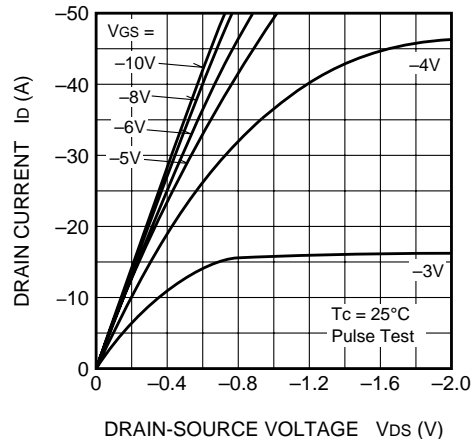
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)



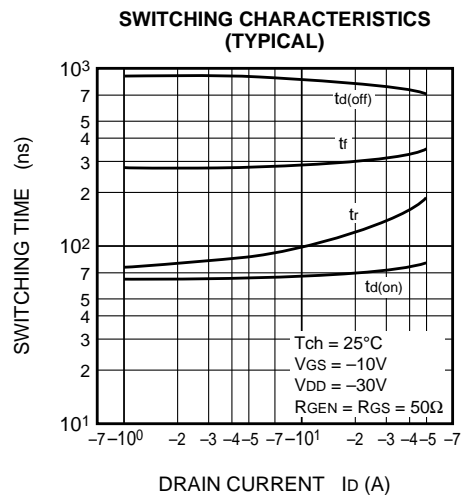
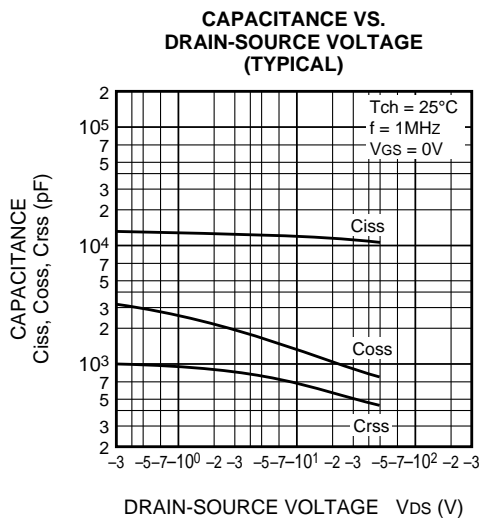
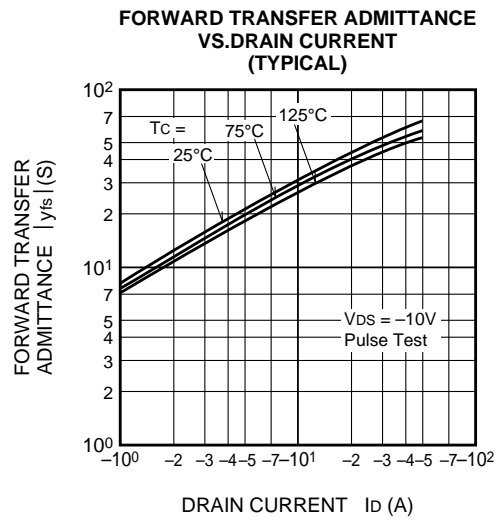
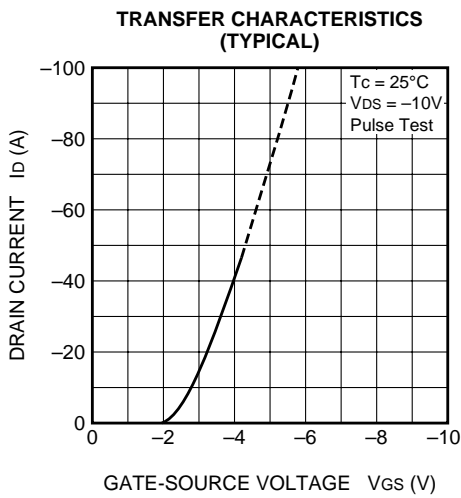
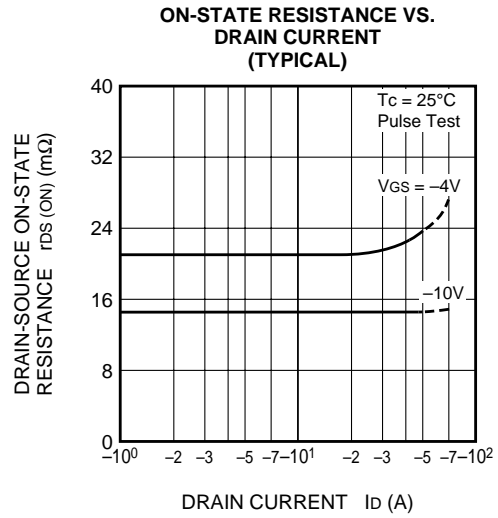
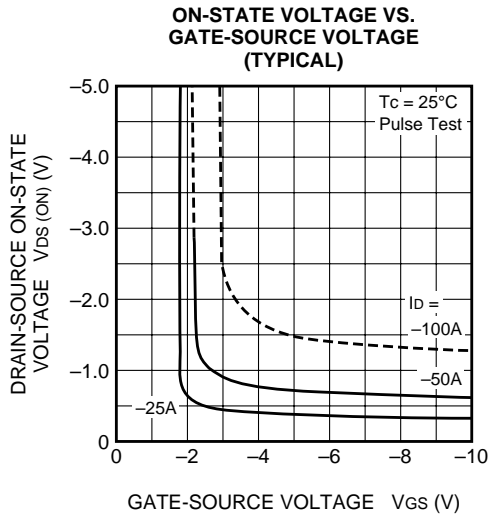
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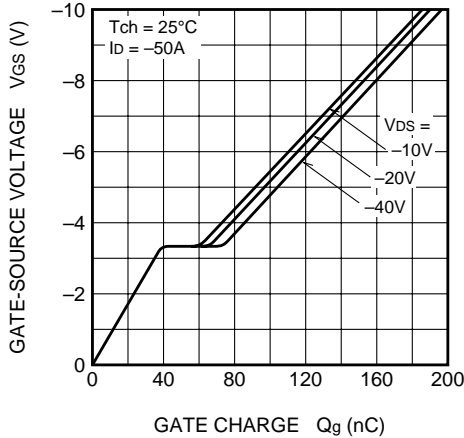
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FX50SMJ-06

HIGH-SPEED SWITCHING USE

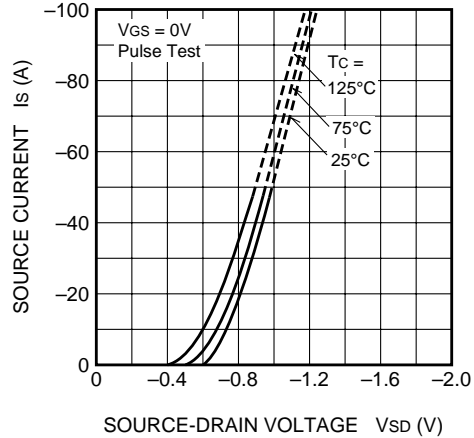


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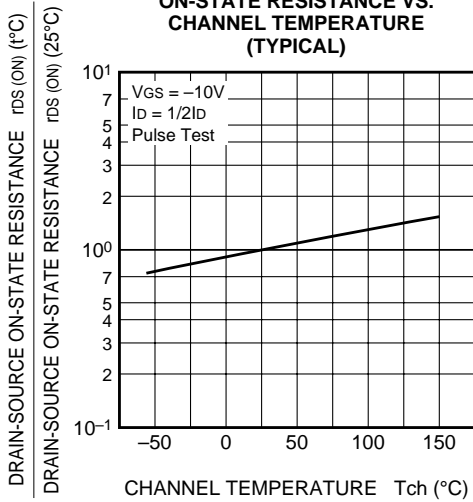
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



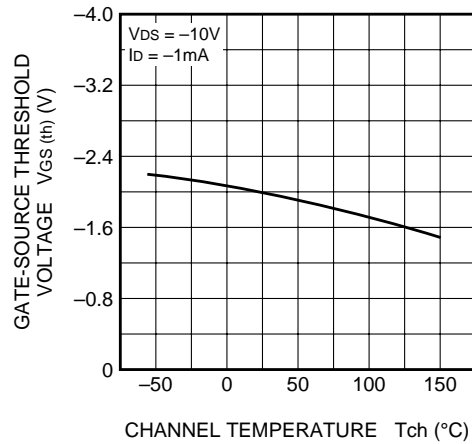
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



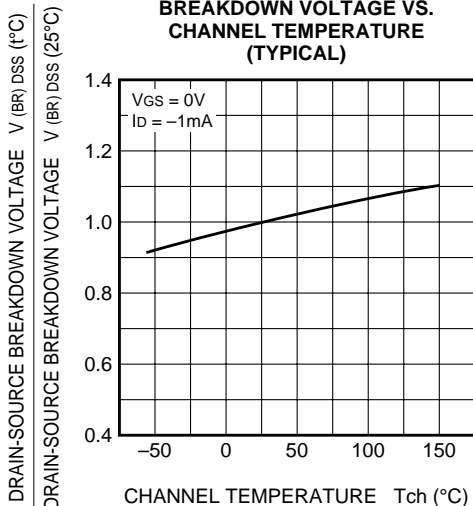
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

