

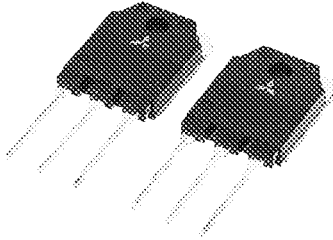
PRELIMINARY
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 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX50SMJ-06

HIGH-SPEED SWITCHING USE

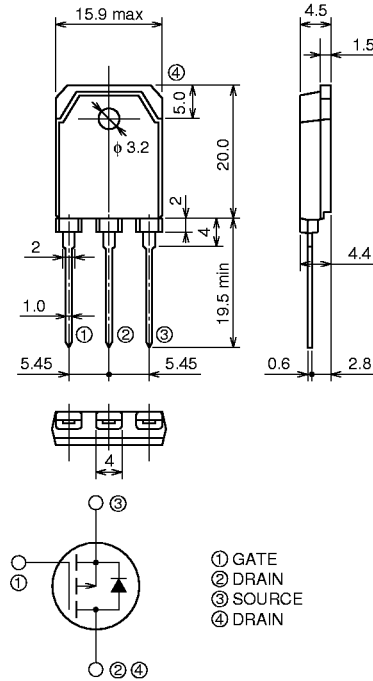
FX50SMJ-06



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

OUTLINE DRAWING

Dimensions in mm



TO-3P

APPLICATION

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

MAXIMUM RATINGS (T_c = 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 = 50μH	-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

Jan.1999

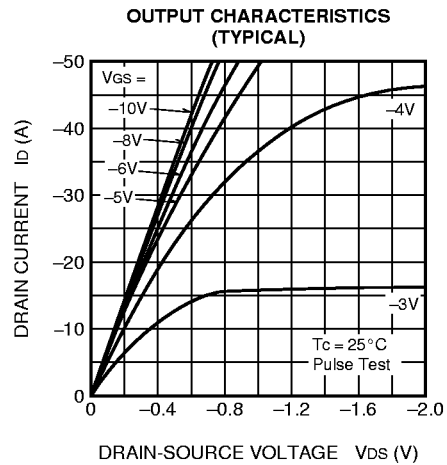
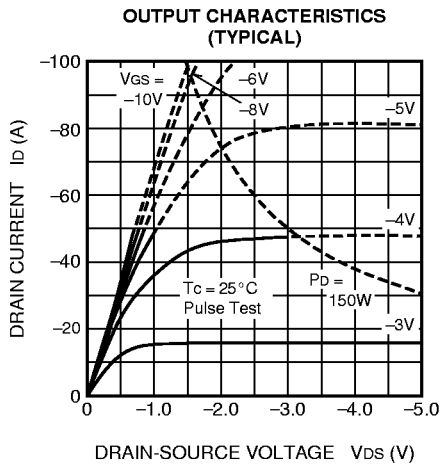
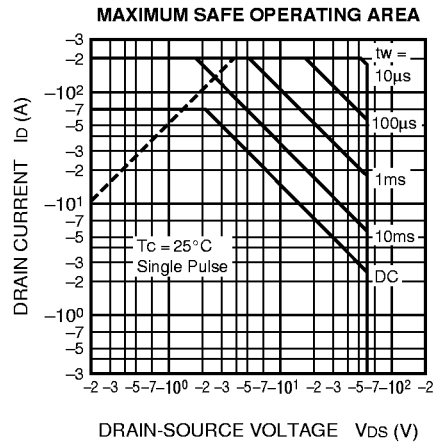
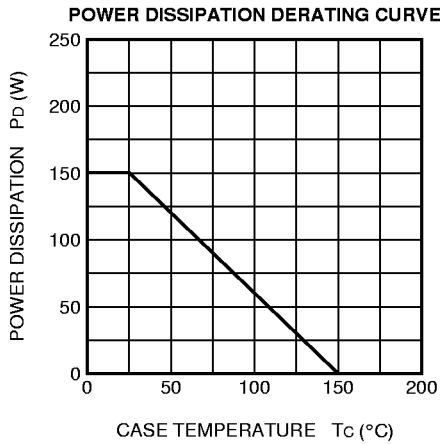


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ELECTRICAL CHARACTERISTICS ($T_{ch} = 25^\circ\text{C}$)

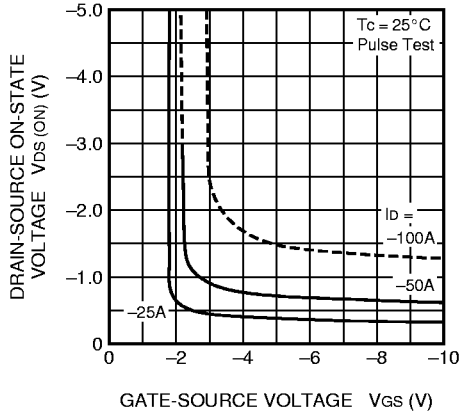
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V(BR)DSS	Drain-source breakdown voltage	$I_D = -1\text{mA}, V_{GS} = 0\text{V}$	-60	—	—	V
IGSS	Gate-source leakage current	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$	—	—	± 0.1	μA
IDSS	Drain-source leakage current	$V_{DS} = -60\text{V}, V_{GS} = 0\text{V}$	—	—	-0.1	mA
VGS(th)	Gate-source threshold voltage	$I_D = -1\text{mA}, V_{DS} = -10\text{V}$	-1.3	-1.8	-2.3	V
rDS(ON)	Drain-source on-state resistance	$I_D = -25\text{A}, V_{GS} = -10\text{V}$	—	15.0	18.9	$\text{m}\Omega$
rDS(ON)	Drain-source on-state resistance	$I_D = -25\text{A}, V_{GS} = -4\text{V}$	—	23	32	$\text{m}\Omega$
VDS(ON)	Drain-source on-state voltage	$I_D = -25\text{A}, V_{GS} = -10\text{V}$	—	-0.38	-0.47	V
yfs	Forward transfer admittance	$I_D = -25\text{A}, V_{DS} = -10\text{V}$	—	49.1	—	S
Ciss	Input capacitance	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	—	11610	—	pF
Coss	Output capacitance		—	1355	—	pF
Crss	Reverse transfer capacitance		—	687	—	pF
td(on)	Turn-on delay time	$V_{DD} = -30\text{V}, I_D = -25\text{A}, V_{GS} = -10\text{V}, R_{GEN} = R_{GS} = 50\Omega$	—	73	—	ns
tr	Rise time		—	137	—	ns
td(off)	Turn-off delay time		—	822	—	ns
tf	Fall time		—	320	—	ns
VSD	Source-drain voltage	$I_S = -25\text{A}, V_{GS} = 0\text{V}$	—	-1.0	-1.5	V
Rth(ch-c)	Thermal resistance	Channel to case	—	—	0.83	$^\circ\text{C/W}$
trr	Reverse recovery time	$I_S = -50\text{A}, \text{dis}/\text{dt} = 100\text{A}/\mu\text{s}$	—	70	—	ns

PERFORMANCE CURVES

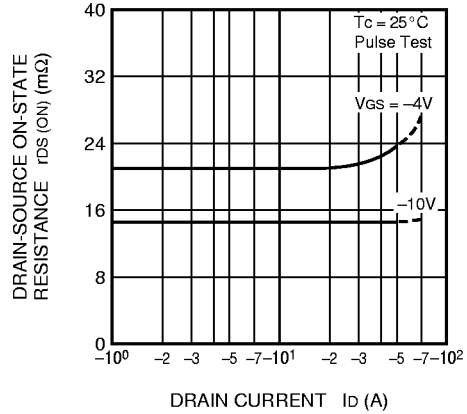


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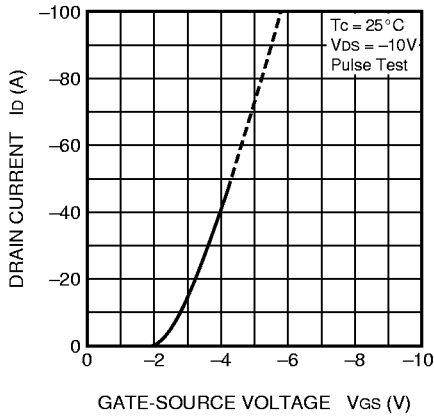
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



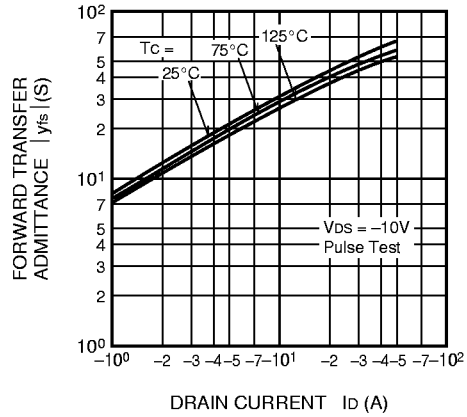
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



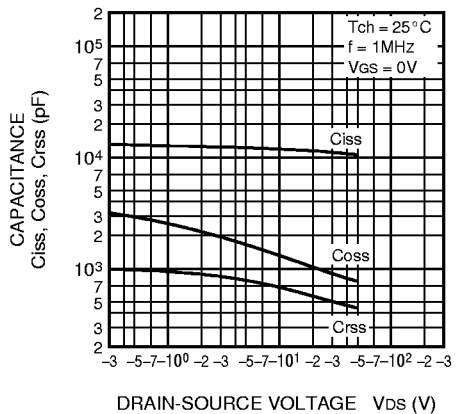
TRANSFER CHARACTERISTICS (TYPICAL)



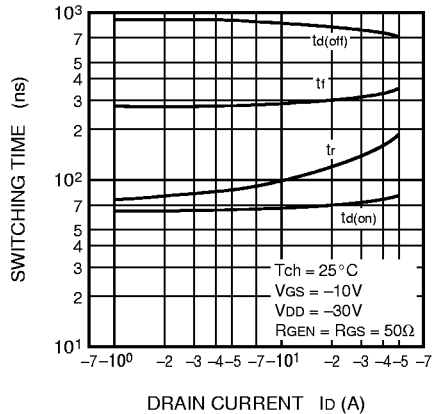
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)

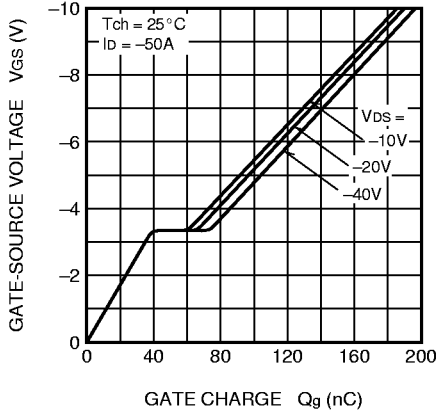


SWITCHING CHARACTERISTICS (TYPICAL)

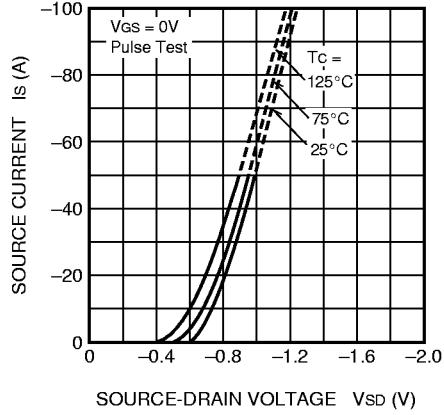


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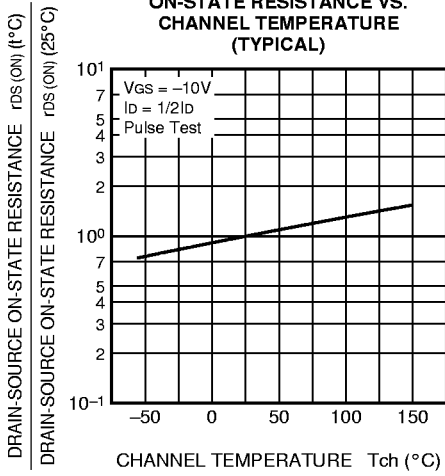
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



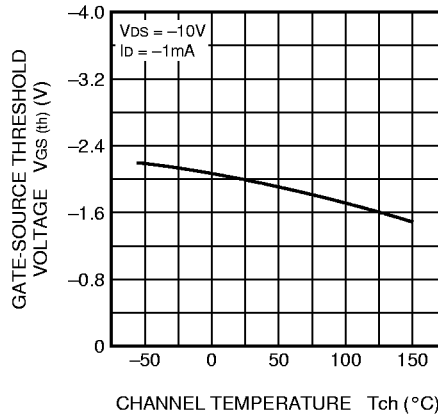
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



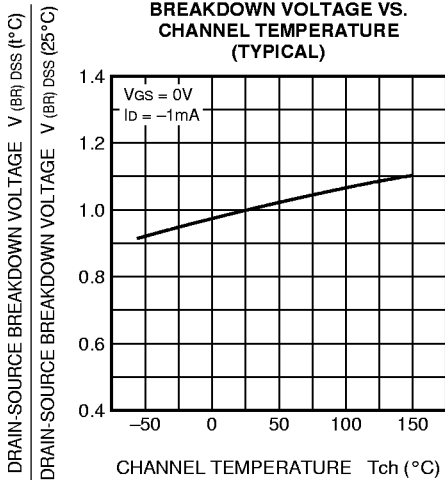
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

