

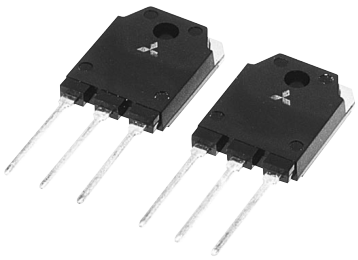
PRELIMINARY
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 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX50SMJ-2

HIGH-SPEED SWITCHING USE

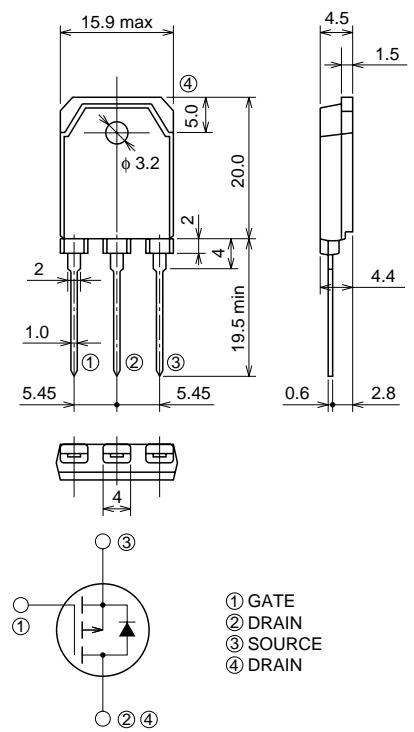
FX50SMJ-2



- 4V DRIVE
- V_{DSS} -100V
- $r_{DS(ON)}$ (MAX) $50m\Omega$
- I_D -50A
- Integrated Fast Recovery Diode (TYP.) 100ns

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	$V_{GS} = 0V$	-100	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)	$L = 30\mu H$	-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

Jan.1999

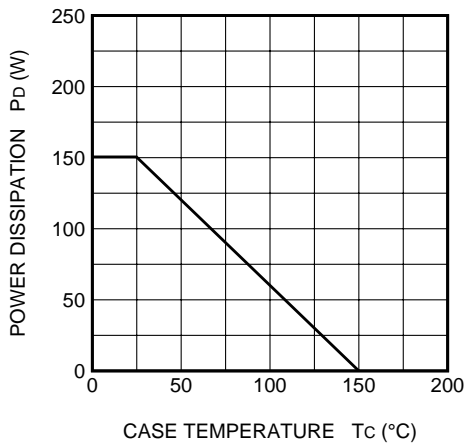
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ELECTRICAL CHARACTERISTICS (T_{ch} = 25°C)

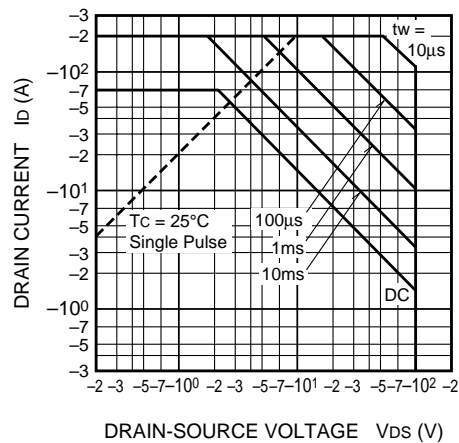
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V (BR) DSS	Drain-source breakdown voltage	I _D = -1mA, V _{GS} = 0V	-100	—	—	V
I _{GSS}	Gate-source leakage current	V _{GS} = ±20V, V _{DS} = 0V	—	—	±0.1	μA
I _{DSS}	Drain-source leakage current	V _{DS} = -100V, V _{GS} = 0V	—	—	-0.1	mA
V _{GS} (th)	Gate-source threshold voltage	I _D = -1mA, V _{DS} = -10V	-1.0	-1.5	-2.0	V
r _{DS} (ON)	Drain-source on-state resistance	I _D = -25A, V _{GS} = -10V	—	39	50	mΩ
r _{DS} (ON)	Drain-source on-state resistance	I _D = -25A, V _{GS} = -4V	—	47	61	mΩ
V _{DS} (ON)	Drain-source on-state voltage	I _D = -25A, V _{GS} = -10V	—	-0.98	-1.25	V
y _{fs}	Forward transfer admittance	I _D = -25A, V _{DS} = -10V	—	49.2	—	S
C _{iss}	Input capacitance	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz	—	11130	—	pF
C _{oss}	Output capacitance		—	896	—	pF
C _{rss}	Reverse transfer capacitance		—	480	—	pF
t _d (on)	Turn-on delay time		—	57	—	ns
t _r	Rise time	V _{DD} = -50V, I _D = -25A, V _{GS} = -10V, R _{GEN} = R _{GS} = 50Ω	—	118	—	ns
t _d (off)	Turn-off delay time		—	828	—	ns
t _f	Fall time		—	380	—	ns
V _{SD}	Source-drain voltage		I _S = -25A, V _{GS} = 0V	—	-1.0	-1.5
R _{th} (ch-c)	Thermal resistance	Channel to case	—	—	0.83	°C/W
t _{rr}	Reverse recovery time	I _S = -50A, dis/dt = 100A/μs	—	100	—	ns

PERFORMANCE CURVES

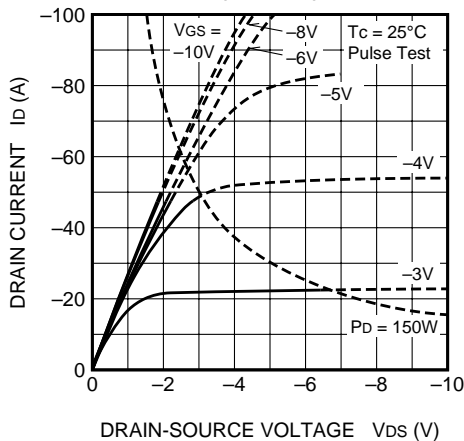
POWER DISSIPATION DERATING CURVE



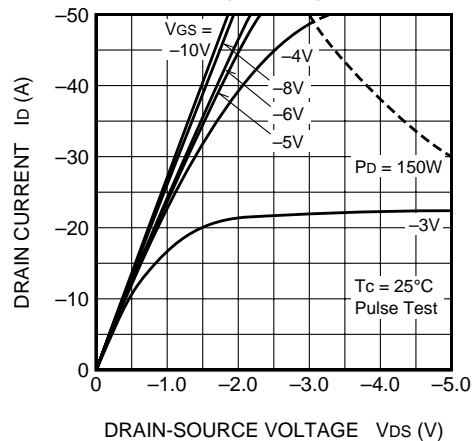
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)

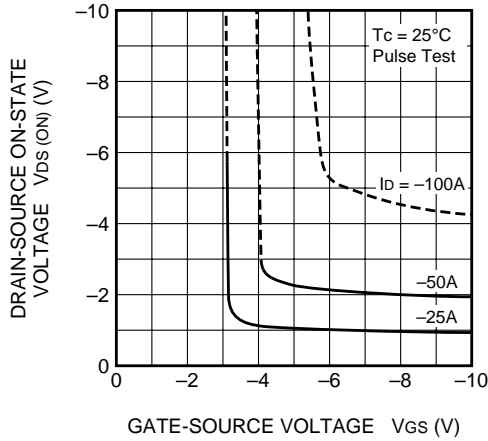


OUTPUT CHARACTERISTICS (TYPICAL)

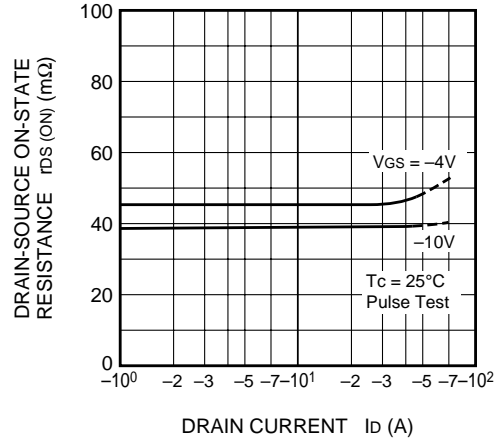


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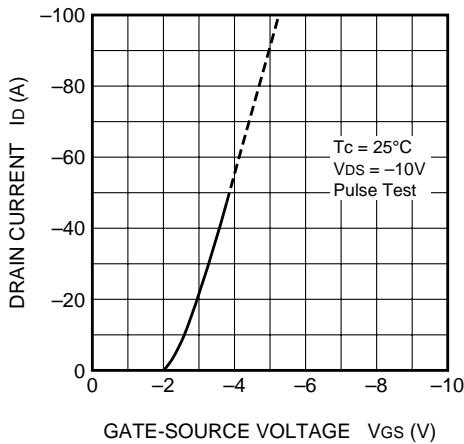
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



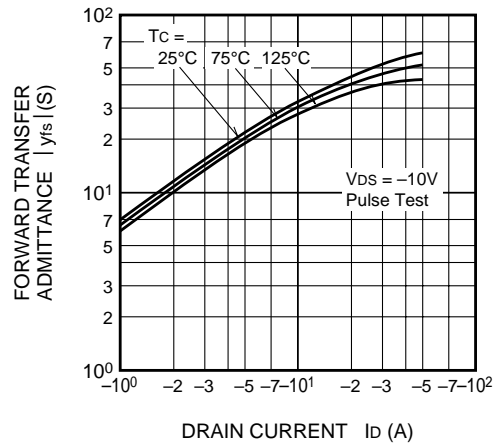
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



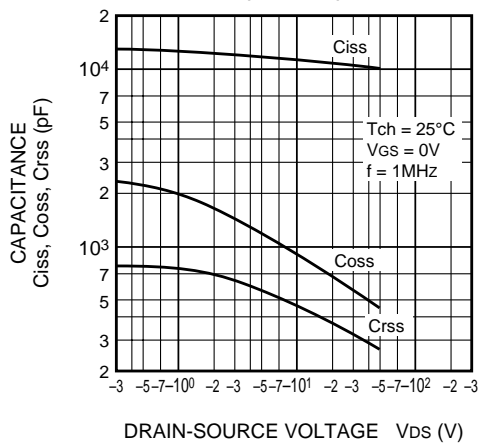
TRANSFER CHARACTERISTICS (TYPICAL)



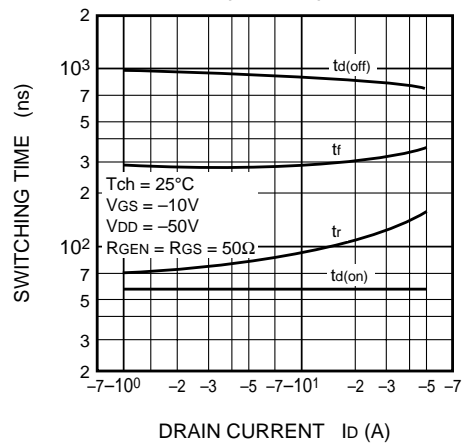
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)

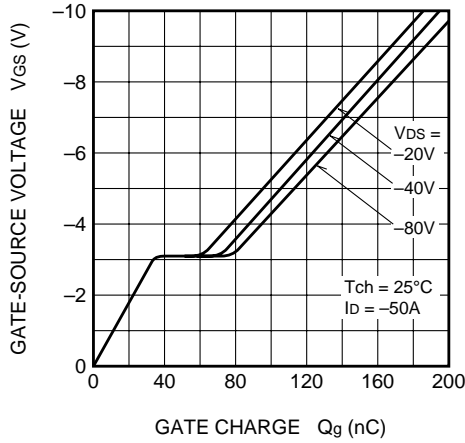


SWITCHING CHARACTERISTICS (TYPICAL)

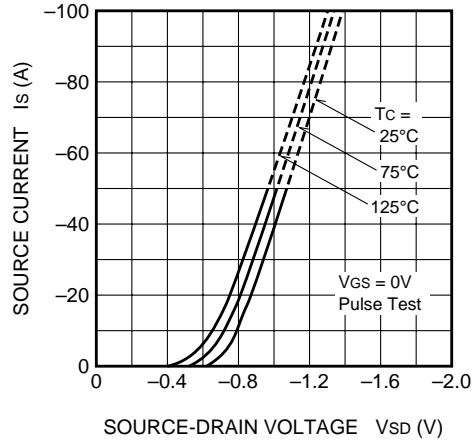


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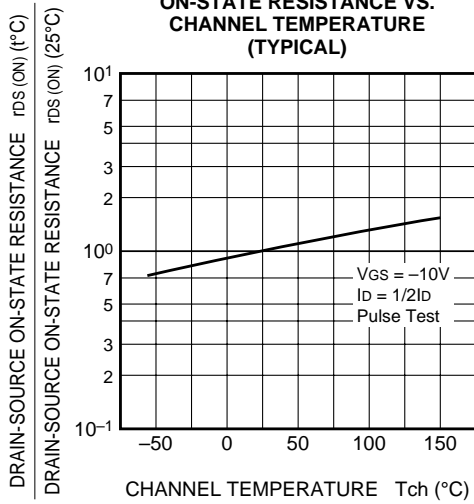
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



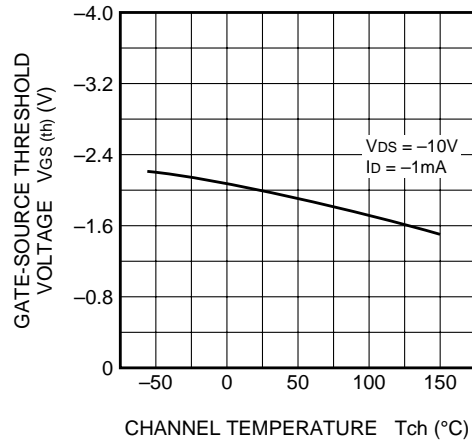
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



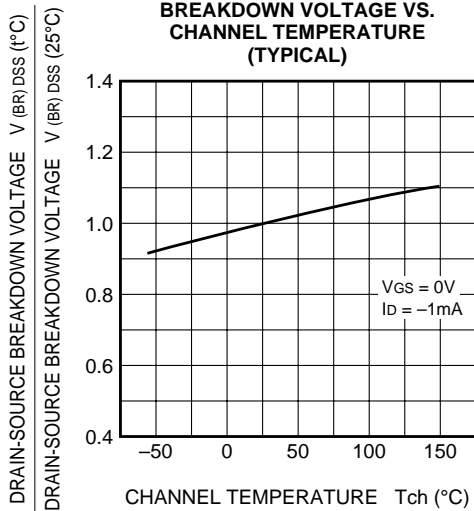
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

