

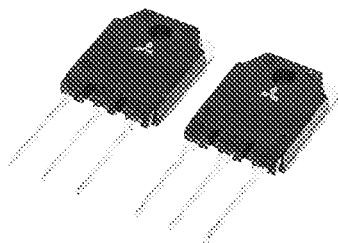
PRELIMINARY
 Notice: This is not a final specification.
 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX70SMJ-03

HIGH-SPEED SWITCHING USE

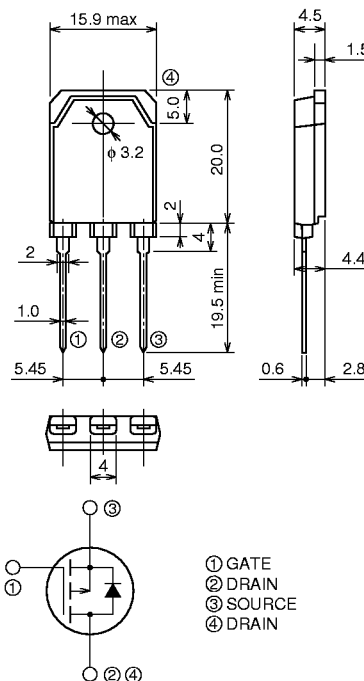
FX70SMJ-03



- 4V DRIVE
- V_{DS} -30V
- $r_{DS(ON)} (MAX)$ 12.3m Ω
- I_D -70A
- 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)

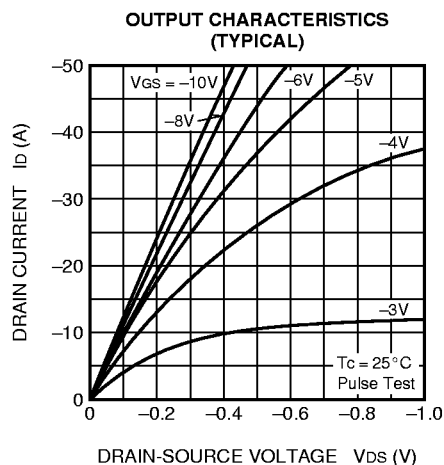
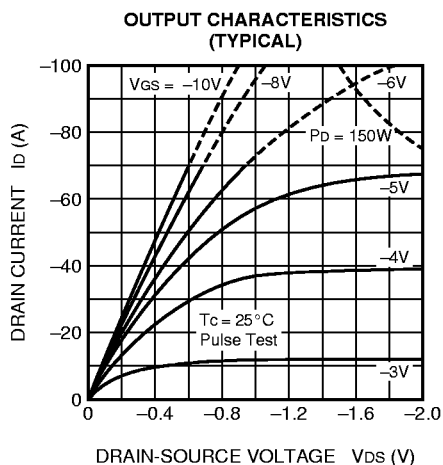
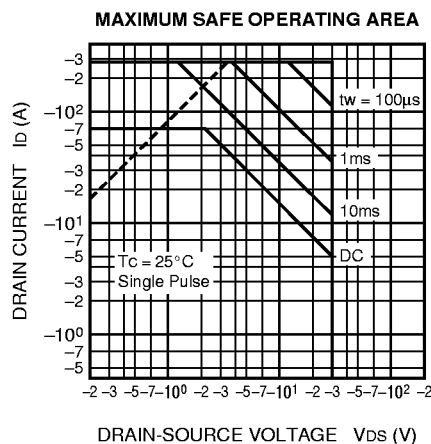
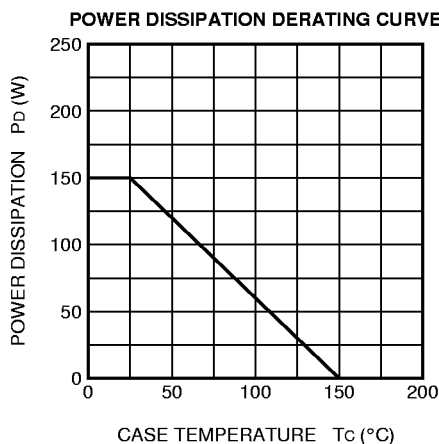
Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	-30	V
V_{GS}	Gate-source voltage	$V_{DS} = 0V$	± 20	V
I_D	Drain current		-70	A
I_{DM}	Drain current (Pulsed)		-280	A
I_{DA}	Avalanche drain current (Pulsed)	$L = 10\mu H$	-70	A
I_S	Source current		-70	A
I_{SM}	Source current (Pulsed)		-280	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

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = -1\text{mA}$, $V_{DS} = 0\text{V}$	-30	—	—	V
I_{GSS}	Gate-source leakage current	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$	—	—	± 0.1	μA
I_{DSS}	Drain-source leakage current	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$	—	—	-0.1	mA
$V_{GS(th)}$	Gate-source threshold voltage	$I_D = -1\text{mA}$, $V_{DS} = -10\text{V}$	-1.3	-1.8	-2.3	V
$r_{DS(ON)}$	Drain-source on-state resistance	$I_D = -35\text{A}$, $V_{GS} = -10\text{V}$	—	10.0	12.3	$\text{m}\Omega$
$r_{DS(ON)}$	Drain-source on-state resistance	$I_D = -26\text{A}$, $V_{GS} = -4\text{V}$	—	19	25	$\text{m}\Omega$
$V_{DS(ON)}$	Drain-source on-state voltage	$I_D = -35\text{A}$, $V_{GS} = -10\text{V}$	—	-0.35	-0.43	V
$ y_{fs} $	Forward transfer admittance	$I_D = -35\text{A}$, $V_{DS} = -10\text{V}$	—	55.8	—	S
C_{iss}	Input capacitance	$V_{DS} = -10\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	—	11140	—	pF
C_{oss}	Output capacitance		—	2300	—	pF
C_{rss}	Reverse transfer capacitance		—	1000	—	pF
$t_d(\text{on})$	Turn-on delay time	$V_{DD} = -15\text{V}$, $I_D = -35\text{A}$, $V_{GS} = -10\text{V}$, $R_{GEN} = R_{GS} = 50\Omega$	—	85	—	ns
t_r	Rise time		—	228	—	ns
$t_d(\text{off})$	Turn-off delay time		—	751	—	ns
t_f	Fall time		—	360	—	ns
V_{SD}	Source-drain voltage	$I_S = -35\text{A}$, $V_{GS} = 0\text{V}$	—	-1.0	-1.5	V
$R_{th(ch-c)}$	Thermal resistance	Channel to case	—	—	0.83	$^{\circ}\text{C/W}$
t_{rr}	Reverse recovery time	$I_S = -35\text{A}$, $di/dt = 50\text{A}/\mu\text{s}$	—	70	—	ns

PERFORMANCE CURVES

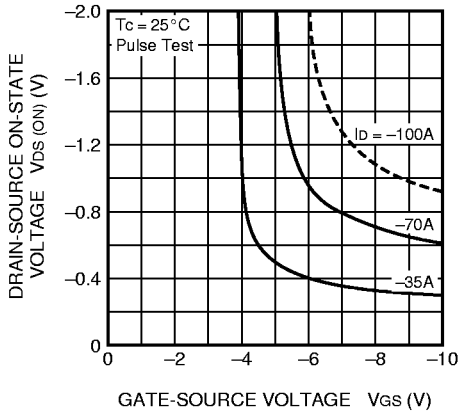


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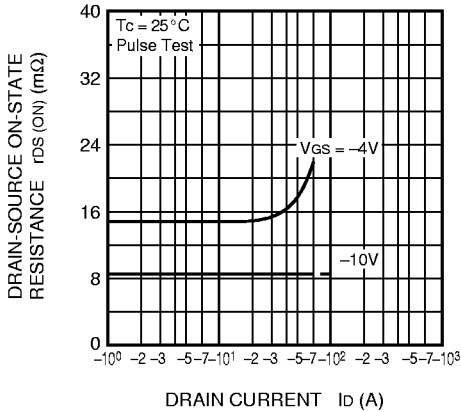
FX70SMJ-03

HIGH-SPEED SWITCHING USE

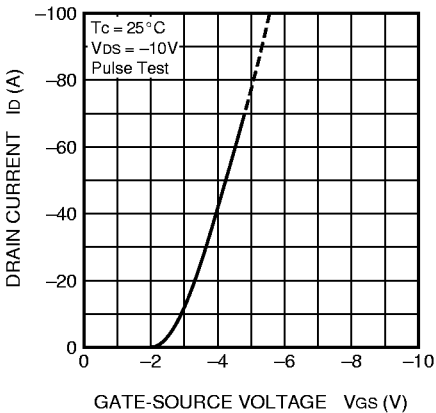
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



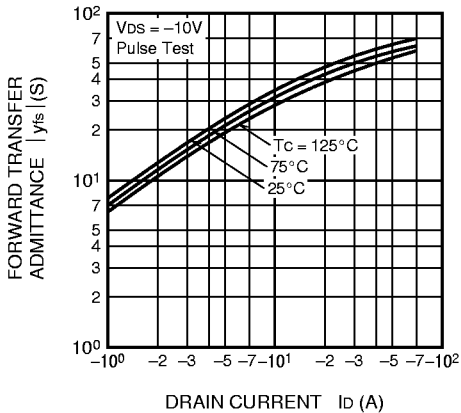
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



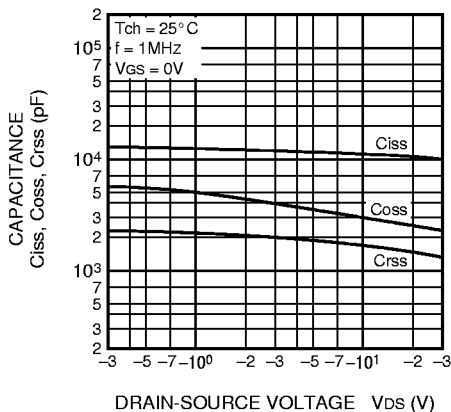
TRANSFER CHARACTERISTICS (TYPICAL)



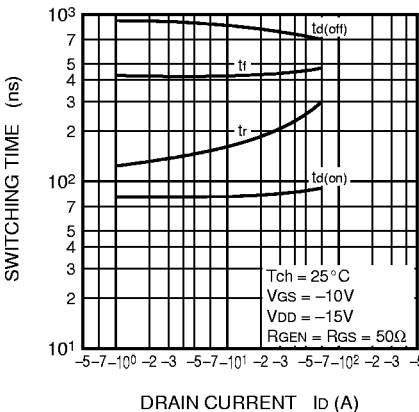
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



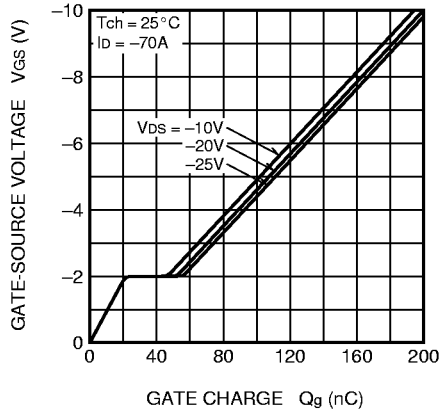
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



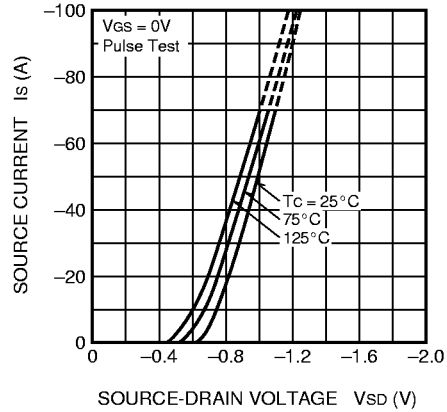
SWITCHING CHARACTERISTICS (TYPICAL)



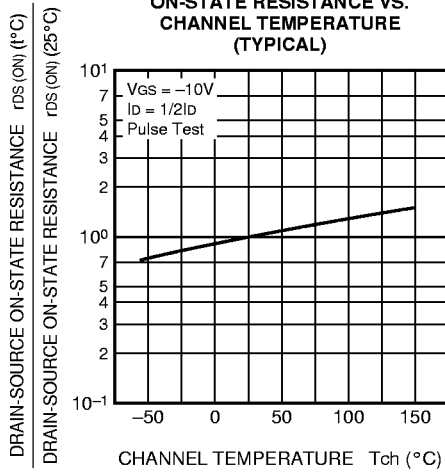
**GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)**



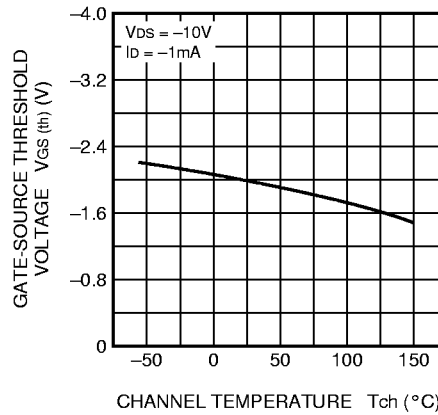
**SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)**



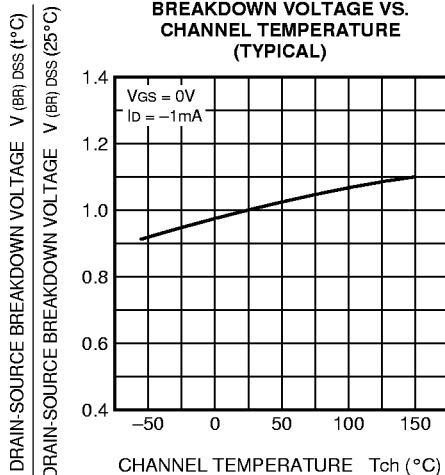
**ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS**

