MITSUBISHI Pch POWER MOSFET

FX6KMJ-2

HIGH-SPEED SWITCHING USE

FX6KMJ-2

- 4V DRIVE
- V_{DSS} .... −100V
- rDS (ON) (MAX) 0.58Ω
- I_D .... −6A
- Integrated Fast Recovery Diode (TYP.) 80ns
- V_{iso} 2000V

OUTLINE DRAWING Dimensions in mm

① GATE
② DRAIN
③ SOURCE

TO-220FN

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		−6	A
I_{DM}	Drain current (Pulsed)		−24	A
I_{DA}	Avalanche drain current (Pulsed)	L = 100µH	−6	A
I_S	Source current		−6	A
I_{SM}	Source current (Pulsed)		−24	A
P_D	Maximum power dissipation		20	W
T_{ch}	Channel temperature		−55 ~ +150	°C
T_{stg}	Storage temperature		−55 ~ +150	°C
V_{iso}	Isolation voltage	AC for 1minute, Terminal to case	2000	V
—	Weight	Typical value	2.0	g

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PRELIMINARY

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

ELECTRICAL CHARACTERISTICS (Tch = 25°C)
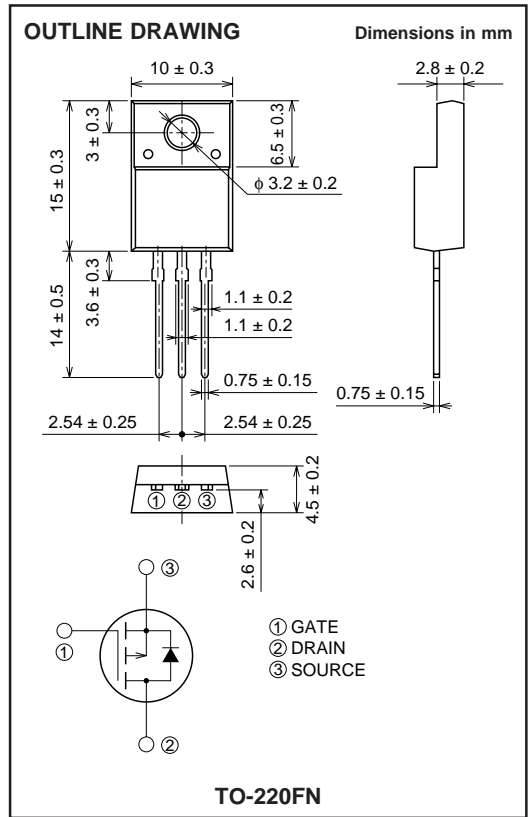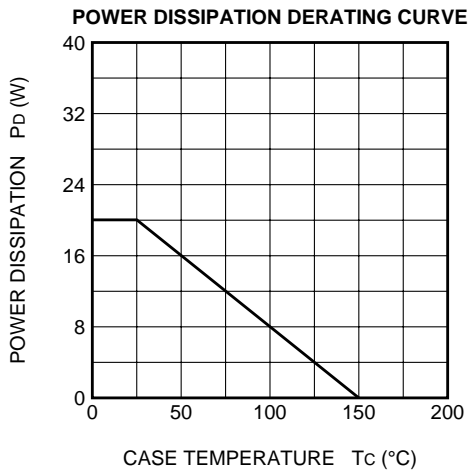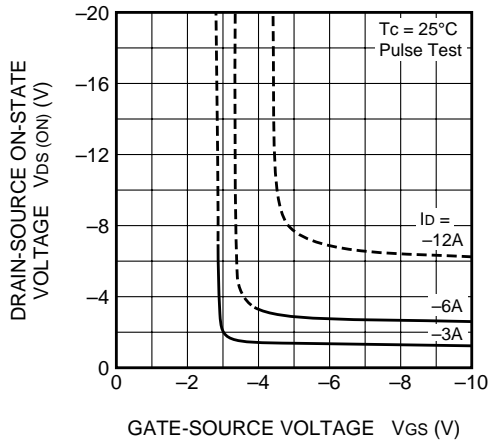
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V (BR) DSS	Drain-source breakdown voltage	$I_D = -1mA$, $V_{GS} = 0V$	−100	—	—	V
IGSS	Gate-source leakage current	$V_{GS} = \pm20V$, $V_{DS} = 0V$	—	—	±0.1	µA
IDSS	Drain-source leakage current	$V_{DS} = -100V$, $V_{GS} = 0V$	—	—	−0.1	mA
VGS (th)	Gate-source threshold voltage	$I_D = -1mA$, $V_{DS} = -10V$	−1.0	−1.5	−2.0	V
rDS (ON)	Drain-source on-state resistance	$I_D = -3A$, $V_{GS} = -10V$	—	0.46	0.58	Ω
rDS (ON)	Drain-source on-state resistance	$I_D = -3A$, $V_{GS} = -4V$	—	0.55	0.72	Ω
VDS (ON)	Drain-source on-state voltage	$I_D = -3A$, $V_{GS} = -10V$	—	−1.38	−1.74	V
|yfs|	Forward transfer admittance	$I_D = -3A$, $V_{DS} = -5V$	—	4.7	—	S
Ciss	Input capacitance		—	1110	—	pF
Coss	Output capacitance	$V_{DS} = -10V$, $V_{GS} = 0V$, $f = 1MHz$	—	108	—	pF
Crss	Reverse transfer capacitance		—	44	—	pF
td (on)	Turn-on delay time		—	9	—	ns
tr	Rise time		—	8	—	ns
td (off)	Turn-off delay time	$V_{DD} = -50V$, $I_D = -3A$, $V_{GS} = -10V$, $R_{GEN} = R_{GS} = 50\Omega$	—	72	—	ns
tf	Fall time		—	33	—	ns
VSD	Source-drain voltage	$I_S = -3A$, $V_{GS} = 0V$	—	−1.0	−1.5	V
Rth (ch-c)	Thermal resistance	Channel to case	—	—	6.25	°C/W
trr	Reverse recovery time	$I_S = -6A$, $dis/dt = 100A/\mu s$	—	80	—	ns

PERFORMANCE CURVES
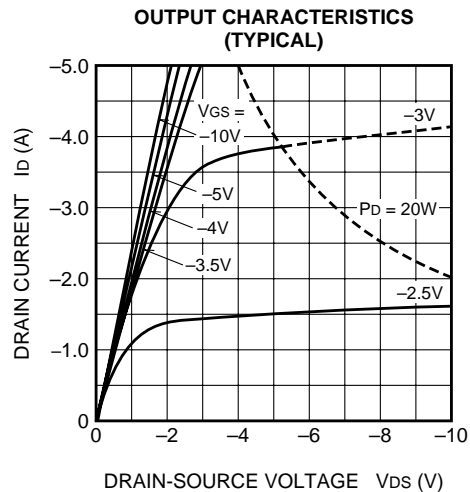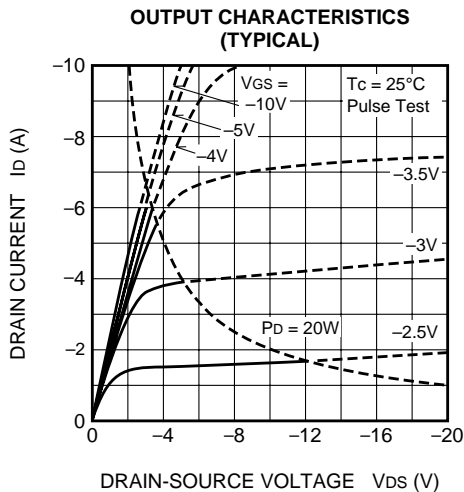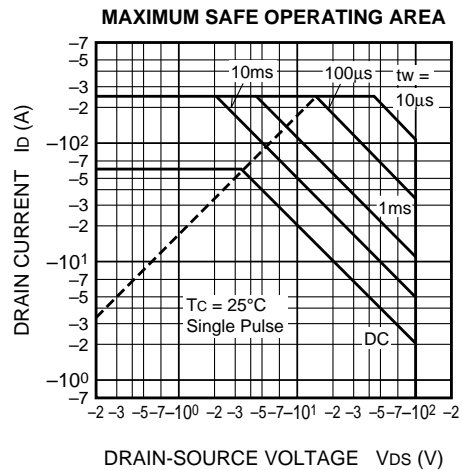
POWER DISSIPATION DERATING CURVE

MAXIMUM SAFE OPERATING AREA

OUTPUT CHARACTERISTICS (TYPICAL)

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

Tc = 25°C
Pulse Test
ID = −12A
−6A
−3A

DRAIN-SOURCE ON-STATE VOLTAGE $V_{DS\,(ON)}$ (V)
GATE-SOURCE VOLTAGE V_{GS} (V)

ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)

V_{GS} = −4V
−10V
Tc = 25°C
Pulse Test

DRAIN-SOURCE ON-STATE RESISTANCE $r_{DS\,(ON)}$ (Ω)
DRAIN CURRENT I_D (A)
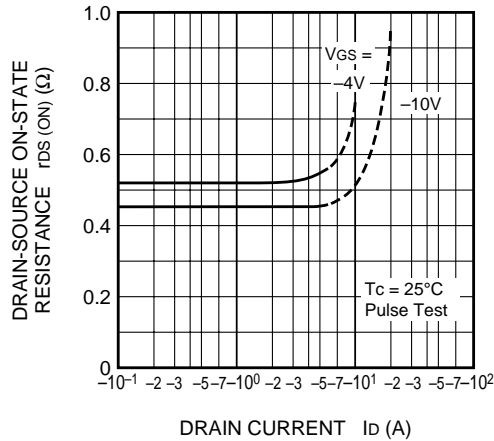
TRANSFER CHARACTERISTICS (TYPICAL)

Tc = 25°C
V_{DS} = −10V
Pulse Test

DRAIN CURRENT I_D (A)
GATE-SOURCE VOLTAGE V_{GS} (V)
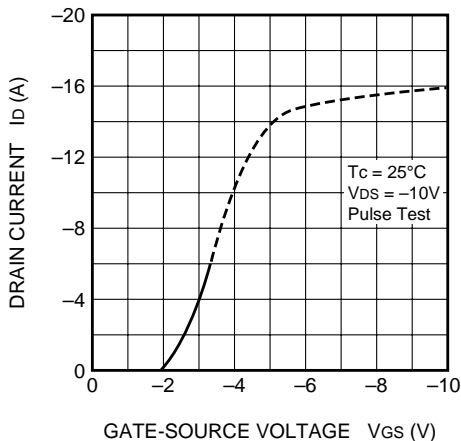
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)

T_C = 25°C   75°C   125°C
V_{DS} = −5V
Pulse Test

FORWARD TRANSFER ADMITTANCE $|y_{fs}|$ (S)
DRAIN CURRENT I_D (A)
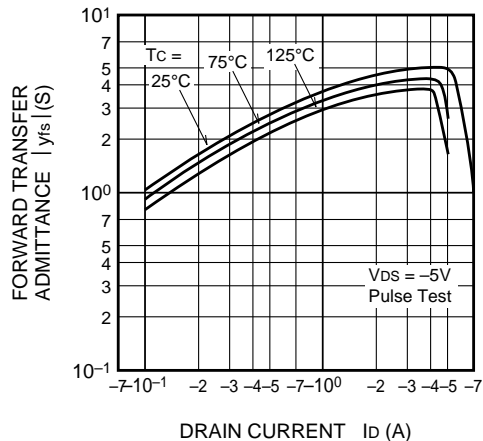
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)

Ciss
Tch = 25°C
f = 1MHz
V_{GS} = 0V
Coss
Crss

CAPACITANCE Ciss, Coss, Crss (pF)
DRAIN-SOURCE VOLTAGE V_{DS} (V)
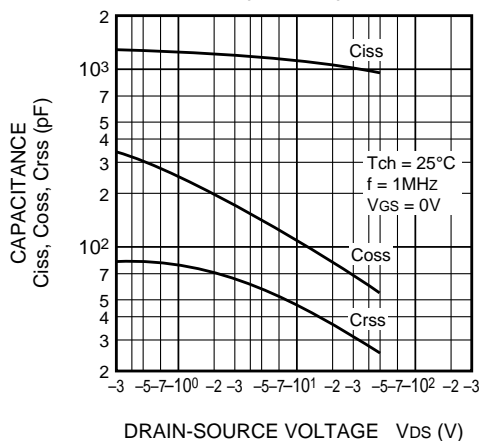
SWITCHING CHARACTERISTICS (TYPICAL)
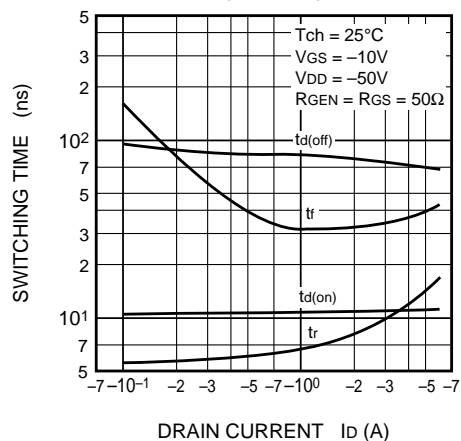
Tch = 25°C
V_{GS} = −10V
V_{DD} = −50V
R_{GEN} = R_{GS} = 50Ω
td(off)
tf
td(on)
tr

SWITCHING TIME (ns)
DRAIN CURRENT I_D (A)

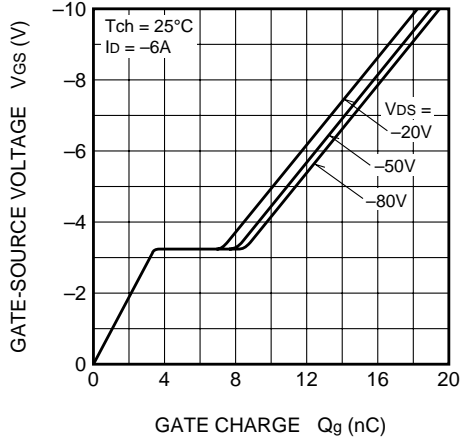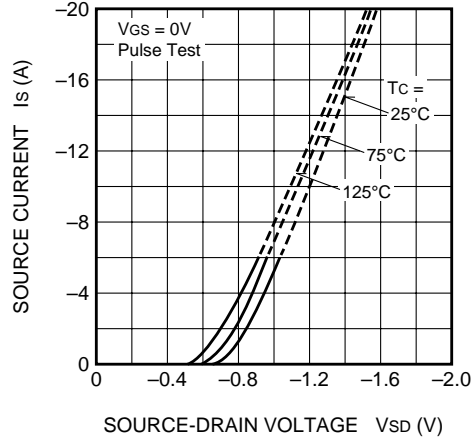**MITSUBISHI ELECTRIC**

PRELIMINARY
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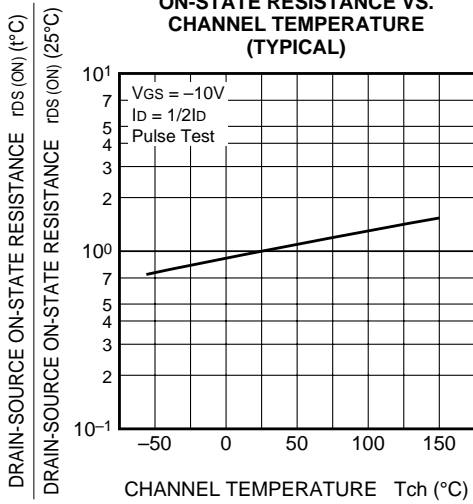Some parametric limits are subject to change.

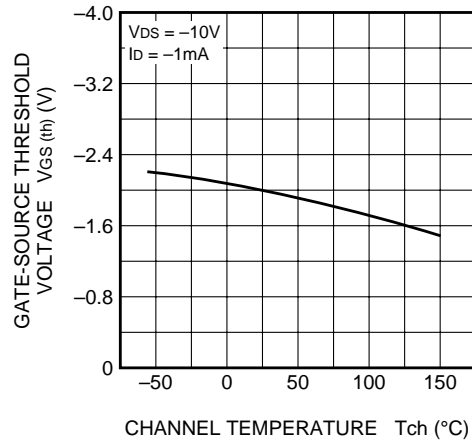### GATE-SOURCE VOLTAGE VS.GATE CHARGE (TYPICAL)

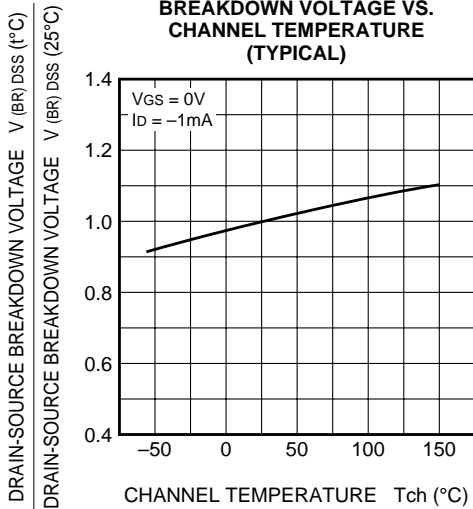### SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)

ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)

THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)

BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)

TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

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