MITSUBISHI Nch POWER MOSFET

FK20KM-6

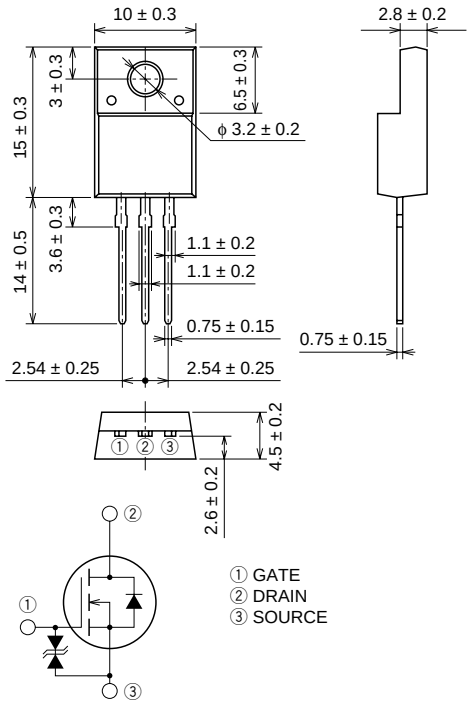
HIGH-SPEED SWITCHING USE

FK20KM-6



- V_{DSS} 300V
- $r_{DS\ (ON)\ (MAX)}$ 0.33Ω
- I_D 20A
- V_{iso} 2000V
- Integrated Fast Recovery Diode (MAX.) 150ns

OUTLINE DRAWING Dimensions in mm



TO-220FN

APPLICATION

Servo motor drive, Robot, UPS, Inverter Fluorecent lamp, etc.

MAXIMUM RATINGS (T_c = 25°C)

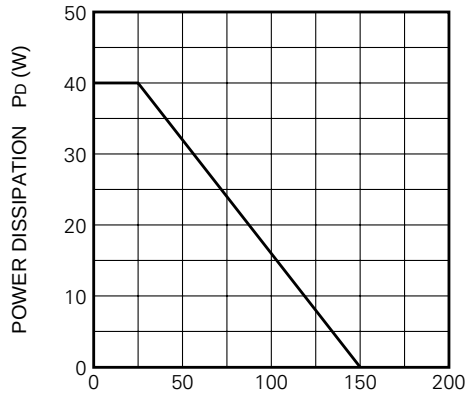
Symbol	Parameter	Conditions	Ratings	Unit
V_{DSS}	Drain-source voltage	V_{GS} = 0V	300	V
V_{GSS}	Gate-source voltage	V_{DS} = 0V	±30	V
I_D	Drain current		20	A
I_{DM}	Drain current (Pulsed)		60	A
I_S	Source current		20	A
I_{SM}	Source current (Pulsed)		60	A
P_D	Maximum power dissipation		40	W
T_{ch}	Channel temperature		–55 ~ +150	°C
T_{stg}	Storage temperature		–55 ~ +150	°C
V_{iso}	Isolation voltage	AC for 1minute, Terminal to case	2000	Vrms
—	Weight	Typical value	2.0	g

ELECTRICAL CHARACTERISTICS (Tch = 25°C)

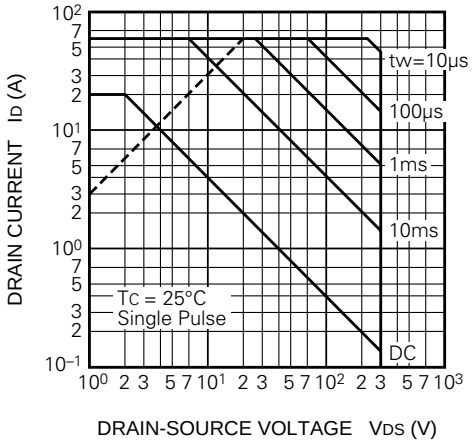
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 1mA, V_{GS} = 0V	300	—	—	V
$V_{(BR)GSS}$	Gate-source breakdown voltage	I_G = ±100µA, V_{DS} = 0V	±30	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±25V, V_{DS} = 0V	—	—	±10	µA
I_{DSS}	Drain-source leakage current	V_{DS} = 300V, V_{GS} = 0V	—	—	1	mA
$V_{GS(th)}$	Gate-source threshold voltage	I_D = 1mA, V_{DS} = 10V	2	3	4	V
$r_{DS(ON)}$	Drain-source on-state resistance	I_D = 10A, V_{GS} = 10V	—	0.25	0.33	Ω
$V_{DS(ON)}$	Drain-source on-state voltage	I_D = 10A, V_{GS} = 10V	—	2.5	3.3	V
$\|y_{fs}\|$	Forward transfer admittance	I_D = 10A, V_{DS} = 10V	8.5	13.0	—	S
C_{iss}	Input capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	—	1400	—	pF
C_{oss}	Output capacitance		—	280	—	pF
C_{rss}	Reverse transfer capacitance		—	55	—	pF
$t_{d(on)}$	Turn-on delay time	V_{DD} = 150V, I_D = 10A, V_{GS} = 10V, R_{GEN} = R_{GS} = 50Ω	—	25	—	ns
t_r	Rise time		—	50	—	ns
$t_{d(off)}$	Turn-off delay time		—	150	—	ns
t_f	Fall time		—	65	—	ns
V_{SD}	Source-drain voltage	I_S = 10A, V_{GS} = 0V	—	1.5	2.0	V
$R_{th(ch-c)}$	Thermal resistance	Channel to case	—	—	3.13	°C/W
t_{rr}	Reverse recovery time	I_S = 20A, di_S/dt = –100A/µs	—	—	150	ns

PERFORMANCE CURVES

POWER DISSIPATION DERATING CURVE

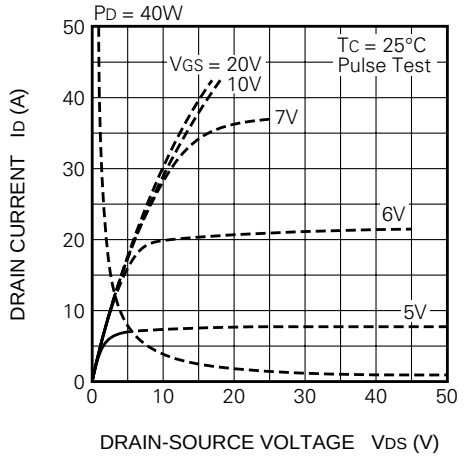


MAXIMUM SAFE OPERATING AREA

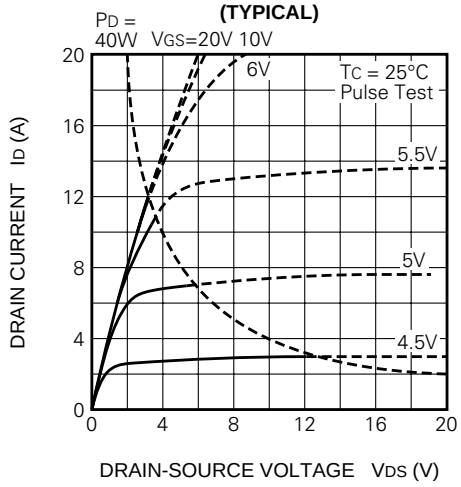


MITSUBISHI ELECTRIC

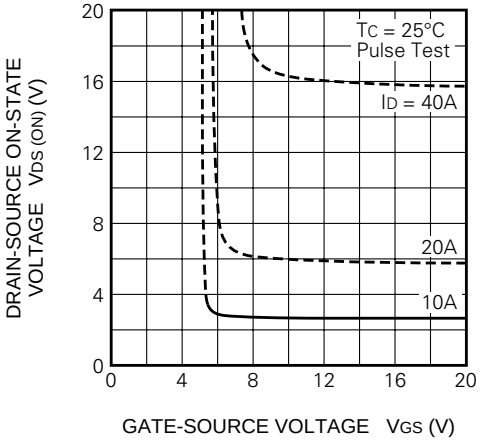
OUTPUT CHARACTERISTICS (TYPICAL)



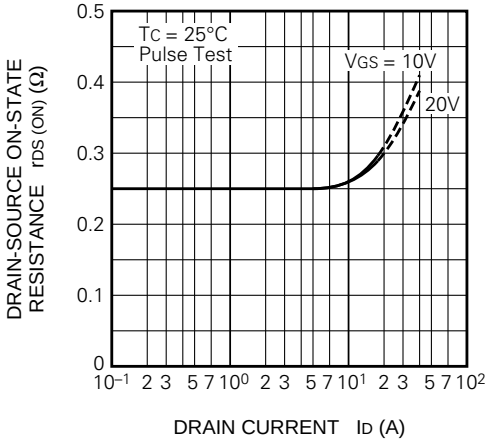
OUTPUT CHARACTERISTICS (TYPICAL)



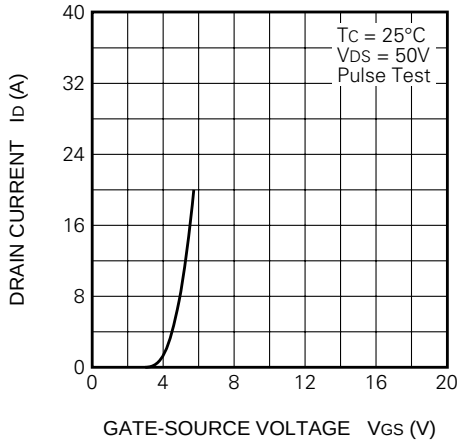
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



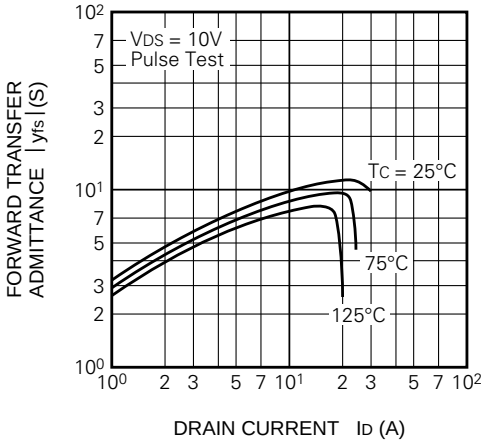
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



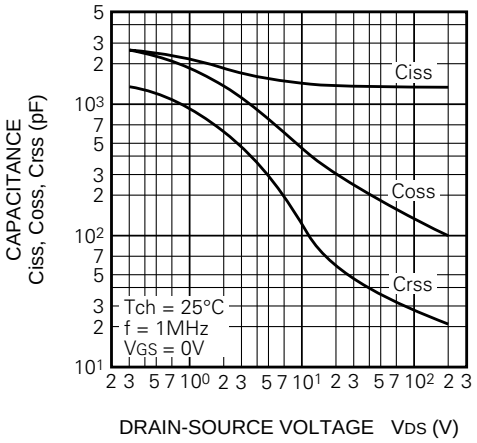
TRANSFER CHARACTERISTICS (TYPICAL)



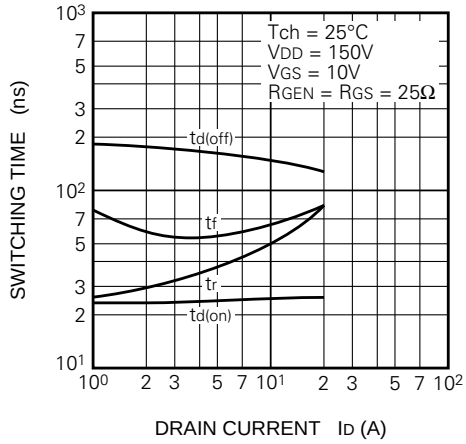
FORWARD TRANSFER ADMITTANCE VS.DRAIN CURRENT (TYPICAL)



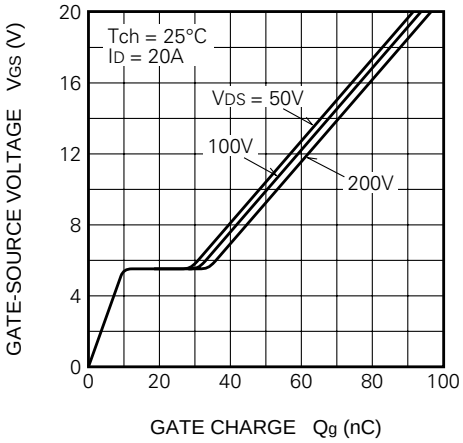
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



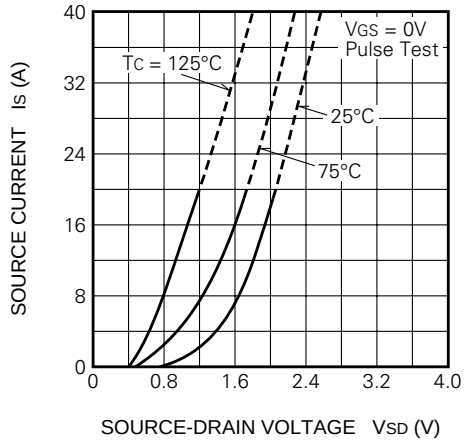
SWITCHING CHARACTERISTICS (TYPICAL)



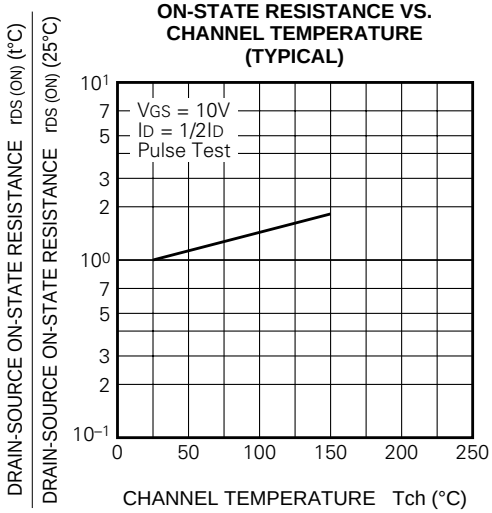
GATE-SOURCE VOLTAGE VS.GATE CHARGE (TYPICAL)



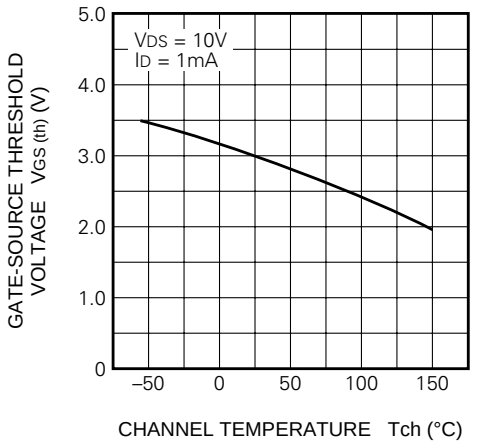
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



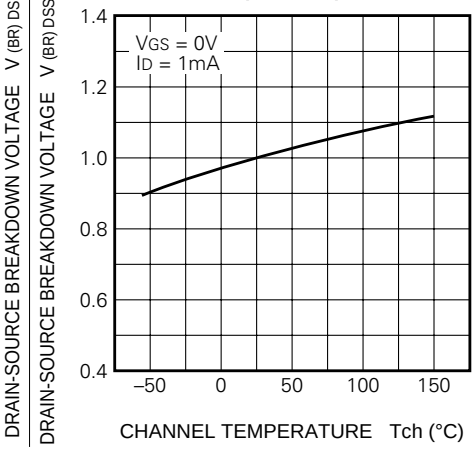
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



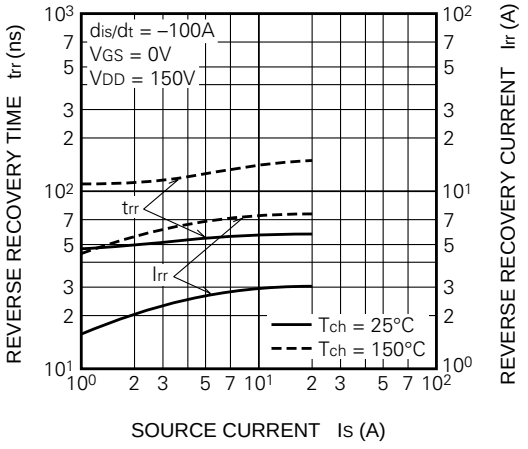
THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



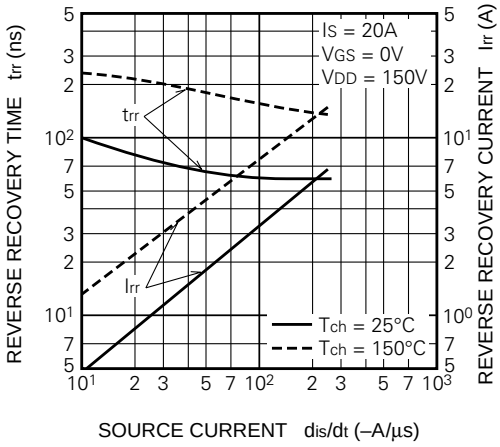
BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



DIODE REVERSE VS. SOURCE CURRENT CHARACTERISTIC (TYPICAL)



DIODE REVERSE VS. SOURCE CURRENT dis/dt CHARACTERISTIC (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

