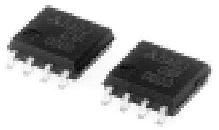
MITSUBISHI Nch POWER MOSFET

FY5ACJ-03F

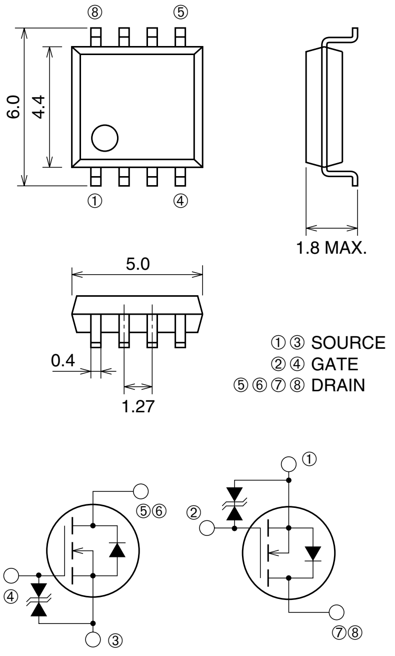
HIGH-SPEED SWITCHING USE

FY5ACJ-03F



- ● 4V DRIVE
- ● V_{DSS} 30V
- ● r_{DS} (ON) (MAX) 27mΩ
- ● I_D 5A

OUTLINE DRAWING **Dimensions in mm**



SOP-8

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	30	V
V_{GSS}	Gate-source voltage	V_{DS} = 0V	±20	V
I_D	Drain current		5	A
I_{DM}	Drain current (Pulsed)		35	A
I_{DA}	Avalanche drain current (Pulsed)	L = 10µH	5	A
I_S	Source current		1.5	A
I_{SM}	Source current (Pulsed)		6.0	A
P_D	Maximum power dissipation		1.6	W
T_{ch}	Channel temperature		–55~+150	°C
T_{stg}	Storage temperature		–55~+150	°C
—	Weight	Typical value	0.07	g

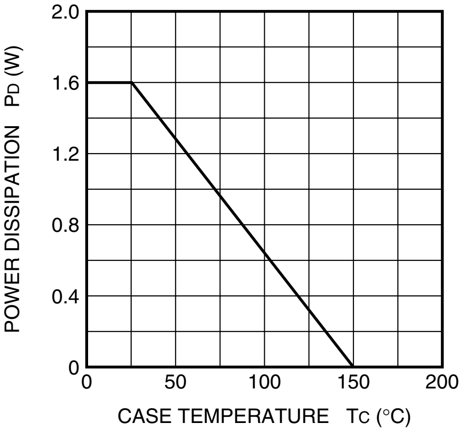
Sep. 2001

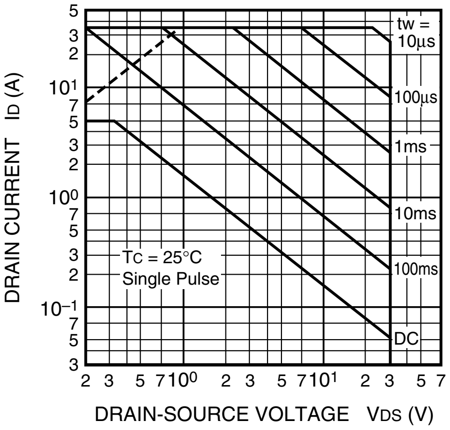
MITSUBISHI
ELECTRIC

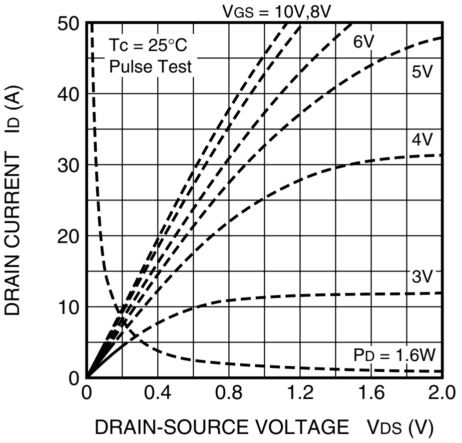
ELECTRICAL CHARACTERISTICS (Tch = 25°C)

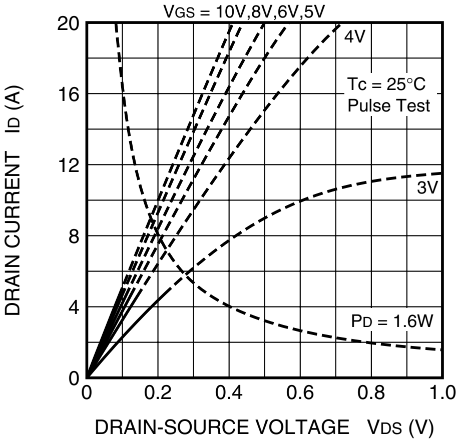
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 1mA, V_{GS} = 0V	30	—	—	V
$V_{(BR)GSS}$	Gate-source breakdown voltage	I_G = ±100µA, V_{DS} = 0V	±20	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±20V, V_{DS} = 0V	—	—	±10	µA
I_{DSS}	Drain-source leakage current	V_{DS} = 30V, 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 = 5A, V_{GS} = 10V	—	21	27	mΩ
$r_{DS(ON)}$	Drain-source on-state resistance	I_D = 2.5A, V_{GS} = 4V	—	34	48	mΩ
$V_{DS(ON)}$	Drain-source on-state voltage	I_D = 5A, V_{GS} = 10V	—	0.105	0.135	V
$\mid y_{fs} \mid$	Forward transfer admittance	I_D = 5A, V_{DS} = 10V	—	10	—	S
C_{iss}	Input capacitance	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz	—	600	—	pF
C_{oss}	Output capacitance		—	200	—	pF
C_{rss}	Reverse transfer capacitance		—	90	—	pF
$t_{d(on)}$	Tum-on delay time	V_{DD} = 15V, I_D = 2.5A, V_{GS} = 10V, R_{GEN} = R_{GS} = 50Ω	—	10	—	ns
t_r	Rise time		—	15	—	ns
$t_{d(off)}$	Tum-off delay time		—	50	—	ns
t_f	Fall time		—	20	—	ns
V_{SD}	Source-drain voltage	I_S = 1.5A, V_{GS} = 0V	—	0.75	1.10	V
$R_{th(ch-a)}$	Thermal resistance	Channel to air	—	—	78.1	°C/W
t_{rr}	Reverse recovery time	I_S = 1.5A, d_{is}/d_t = –50A/µs	—	40	—	ns

PERFORMANCE CURVES

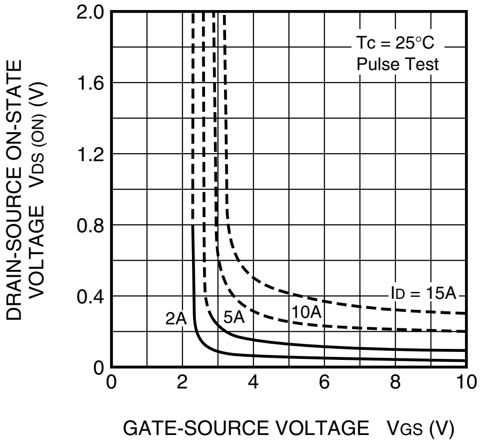

POWER DISSIPATION DERATING CURVE


MAXIMUM SAFE OPERATING AREA

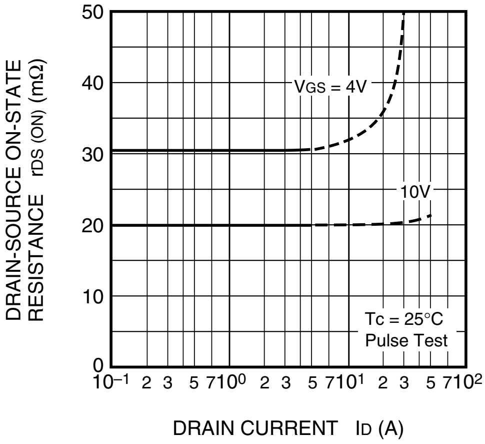

OUTPUT CHARACTERISTICS (TYPICAL)


OUTPUT CHARACTERISTICS (TYPICAL)

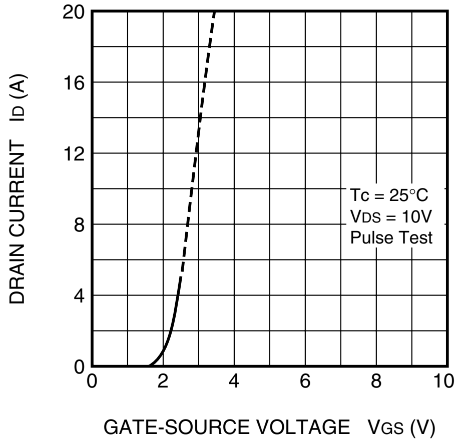
**ON-STATE VOLTAGE VS.
GATE-SOURCE VOLTAGE
(TYPICAL)**



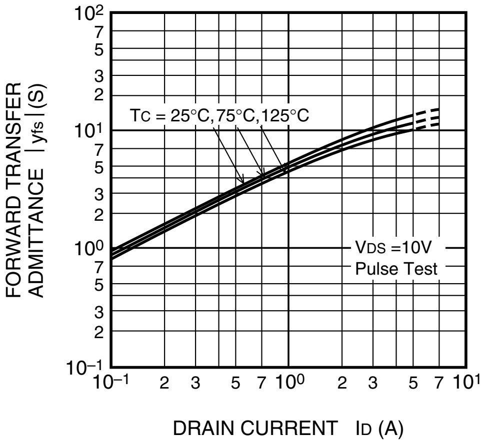
**ON-STATE RESISTANCE VS.
DRAIN CURRENT
(TYPICAL)**



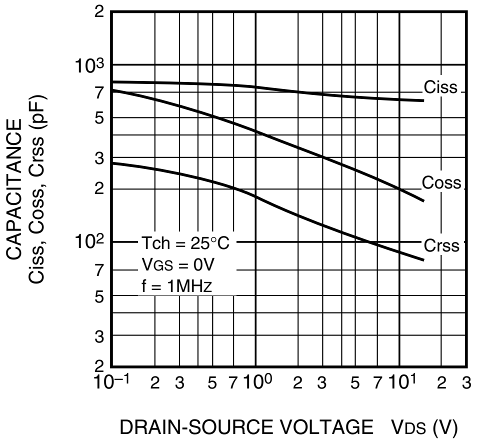
**TRANSFER CHARACTERISTICS
(TYPICAL)**



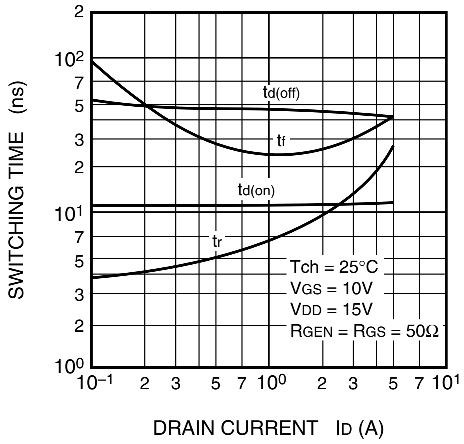
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT
(TYPICAL)**



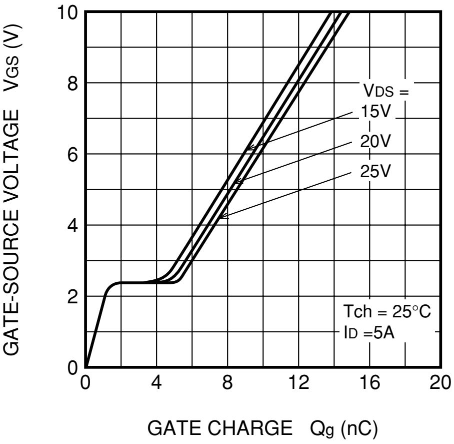
**CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE
(TYPICAL)**



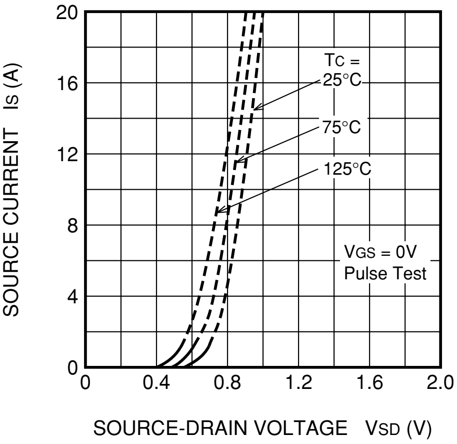
**SWITCHING CHARACTERISTICS
(TYPICAL)**



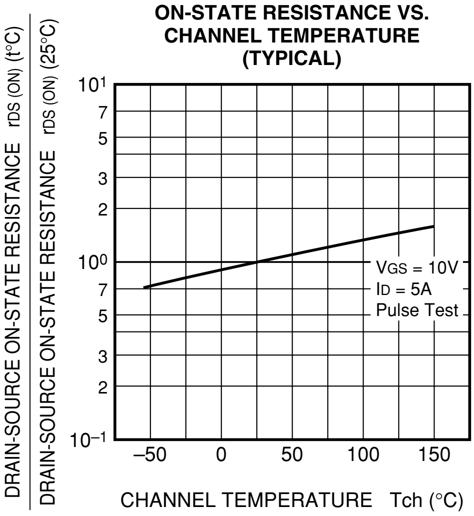
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



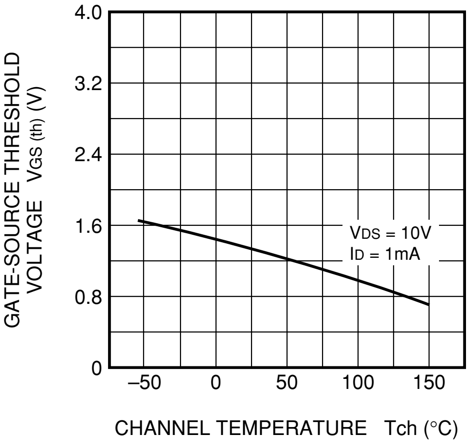
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



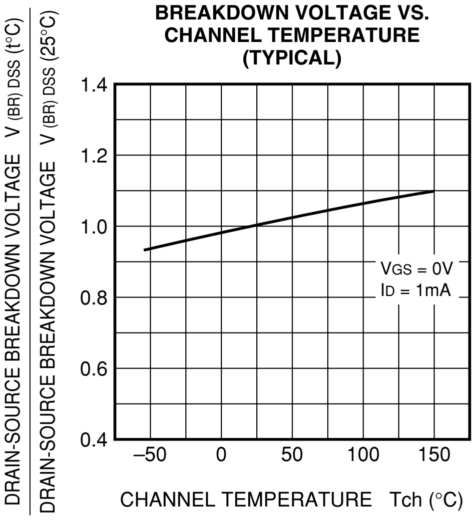
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS