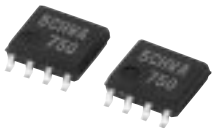
MITSUBISHI Nch POWER MOSFET

FY5ACH-03A

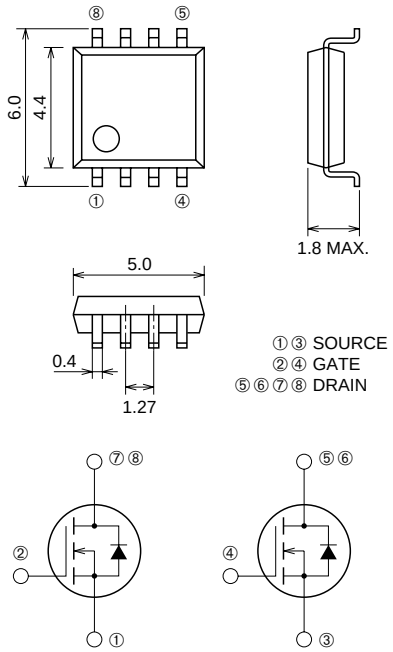
HIGH-SPEED SWITCHING USE

FY5ACH-03A



- 2.5V DRIVE
- V_{DSS} 30V
- $r_{DS\ (ON)\ (MAX)}$ 50mΩ
- 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	±10	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		1.7	A
I_{SM}	Source current (Pulsed)		6.8	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

MITSUBISHI ELECTRIC

FY5ACH-03A

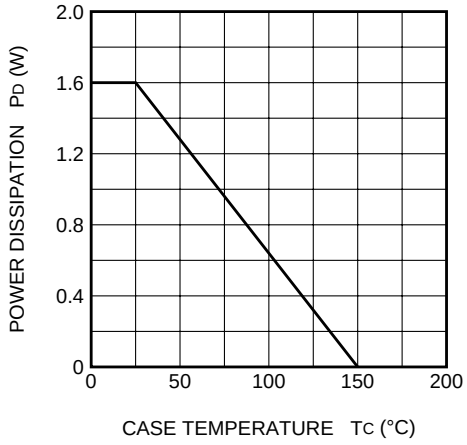
HIGH-SPEED SWITCHING USE

ELECTRICAL CHARACTERISTICS (Tch = 25°C)

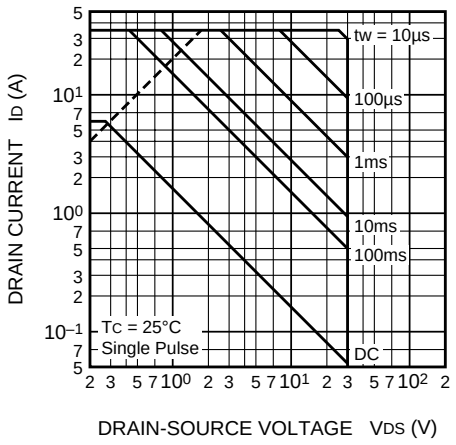
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 1mA, V_{DS} = 0V	30	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±10V, V_{DS} = 0V	—	—	±0.1	µA
I_{DSS}	Drain-source leakage current	V_{DS} = 30V, V_{GS} = 0V	—	—	0.1	mA
$V_{GS(th)}$	Gate-source threshold voltage	I_D = 1mA, V_{DS} = 10V	0.5	0.9	1.3	V
$r_{DS(ON)}$	Drain-source on-state resistance	I_D = 5A, V_{GS} = 4V	—	40	50	mΩ
$r_{DS(ON)}$	Drain-source on-state resistance	I_D = 2.5A, V_{GS} = 2.5V	—	52	80	mΩ
$V_{DS(ON)}$	Drain-source on-state voltage	I_D = 5A, V_{GS} = 4V	—	0.20	0.25	V
$\lvert y_{fs} \rvert$	Forward transfer admittance	I_D = 5A, V_{DS} = 10V	—	11	—	S
C_{iss}	Input capacitance	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz	—	750	—	pF
C_{oss}	Output capacitance		—	180	—	pF
C_{rss}	Reverse transfer capacitance		—	80	—	pF
$t_{d(on)}$	Turn-on delay time	V_{DD} = 15V, I_D = 2.5A, V_{GS} = 4V, R_{GEN} = R_{GS} = 50Ω	—	18	—	ns
t_r	Rise time		—	45	—	ns
$t_{d(off)}$	Turn-off delay time		—	52	—	ns
t_f	Fall time		—	44	—	ns
V_{SD}	Source-drain voltage	I_S = 1.7A, V_{GS} = 0V	—	0.75	1.1	V
$R_{th(ch-a)}$	Thermal resistance	Channel to ambient	—	—	78.1	°C/W
t_{rr}	Reverse recovery time	I_S = 1.7A, dis/dt = –50A/µs	—	100	—	ns

PERFORMANCE CURVES

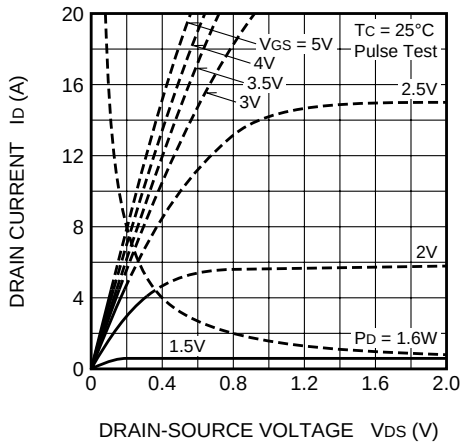
POWER DISSIPATION DERATING CURVE



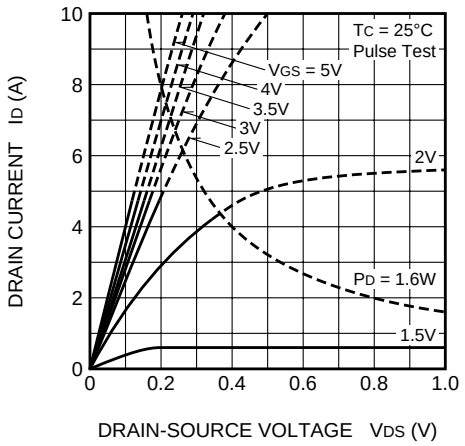
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)

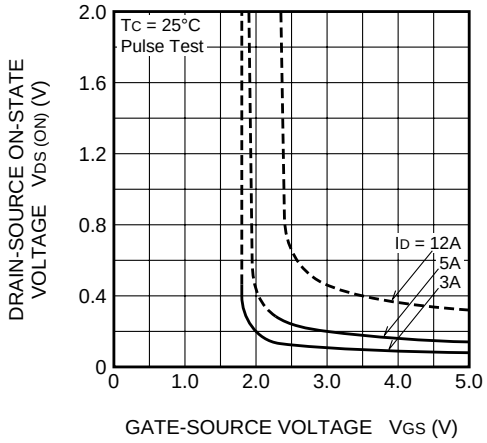


OUTPUT CHARACTERISTICS (TYPICAL)

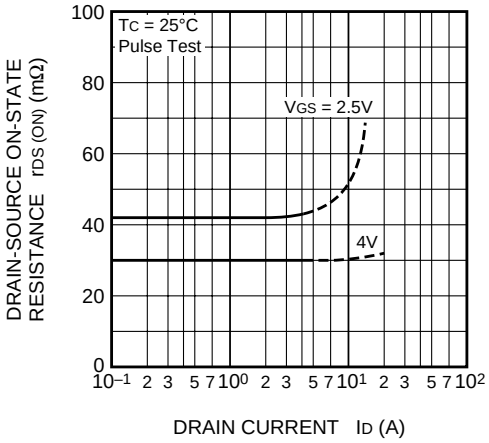


MITSUBISHI ELECTRIC

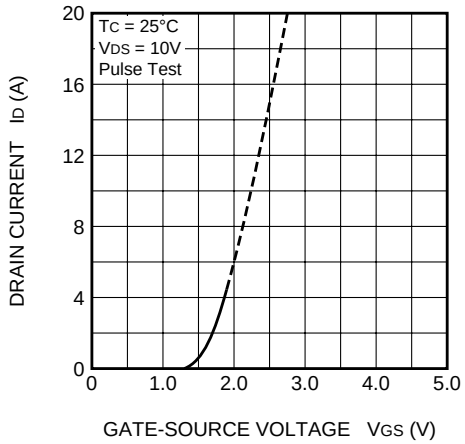
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



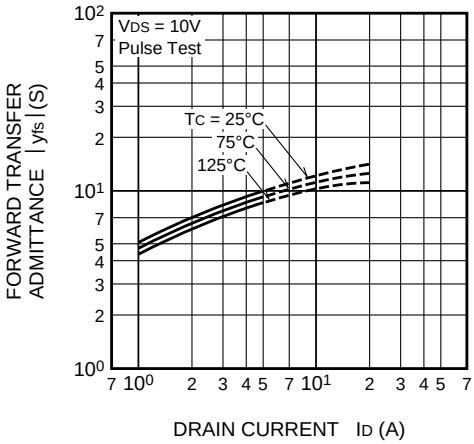
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



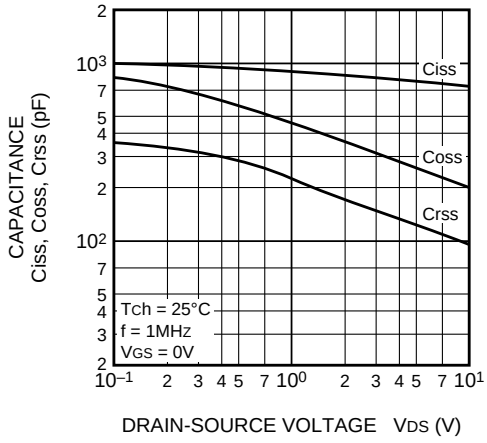
TRANSFER CHARACTERISTICS (TYPICAL)



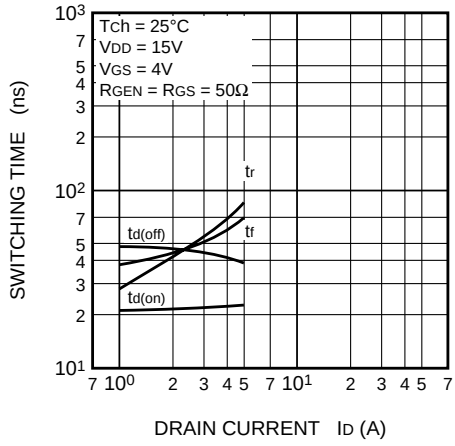
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



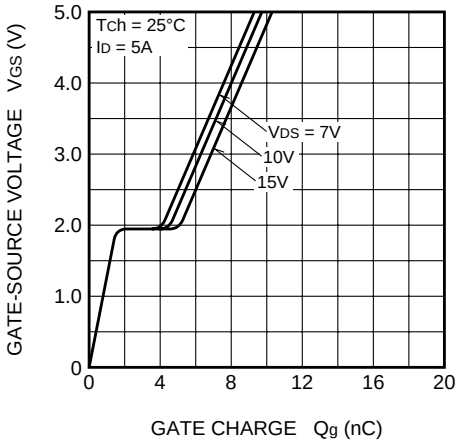
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



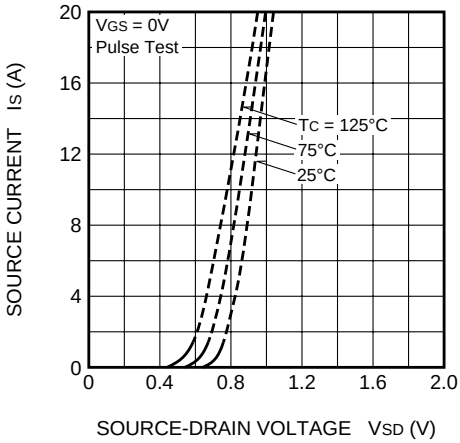
SWITCHING CHARACTERISTICS (TYPICAL)



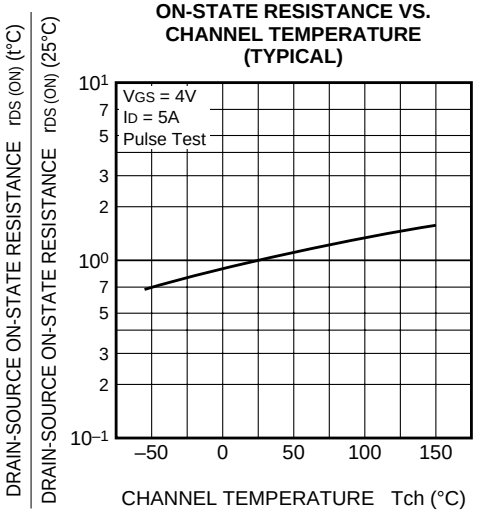
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



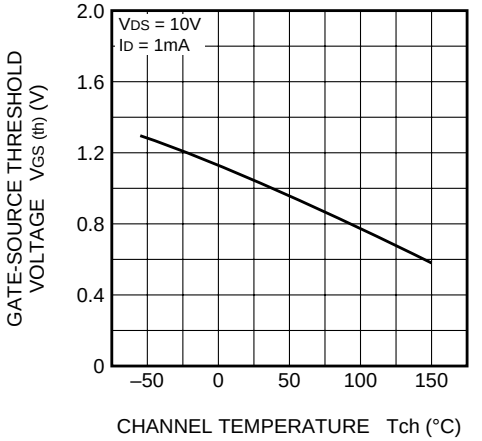
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



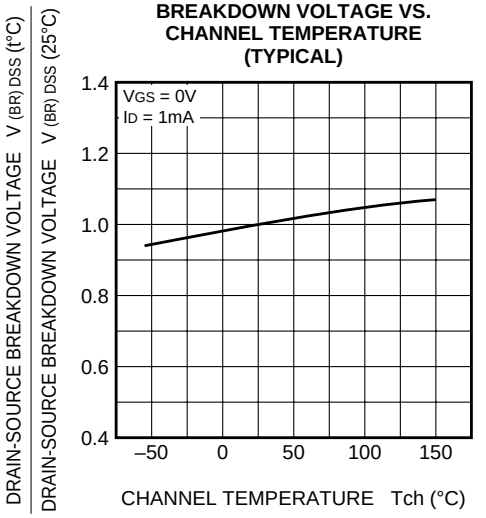
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS