

# FS5UM-10

HIGH-SPEED SWITCHING USE

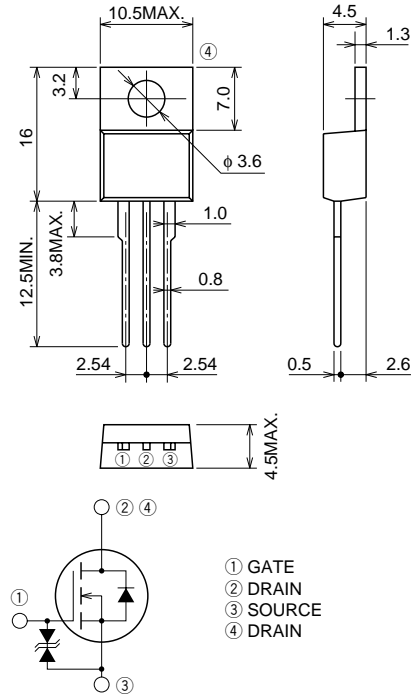
## FS5UM-10



- $V_{DS}$  ..... 500V
- $r_{DS(ON)} (MAX)$  .....  $1.8\Omega$
- $I_D$  ..... 5A

## OUTLINE DRAWING

Dimensions in mm



TO-220

## APPLICATION

SMPS, DC-DC Converter, battery charger, power supply of printer, copier, HDD, FDD, TV, VCR, personal computer etc.

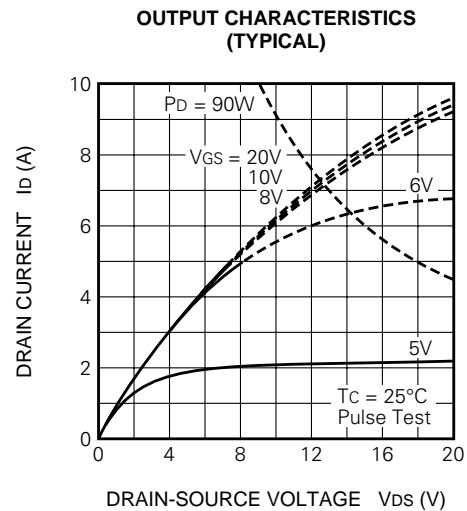
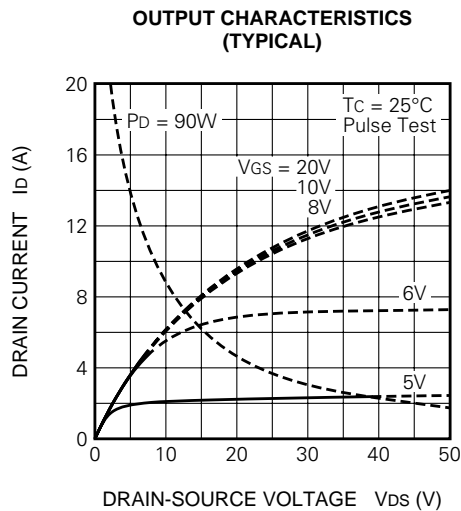
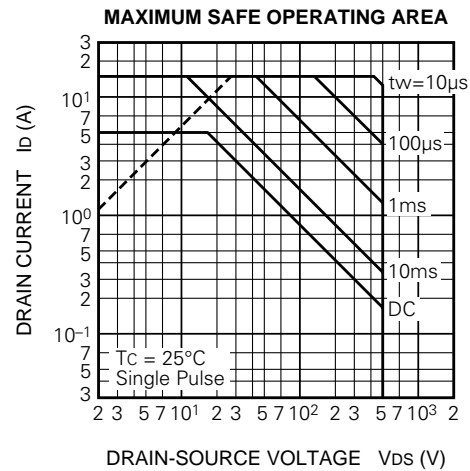
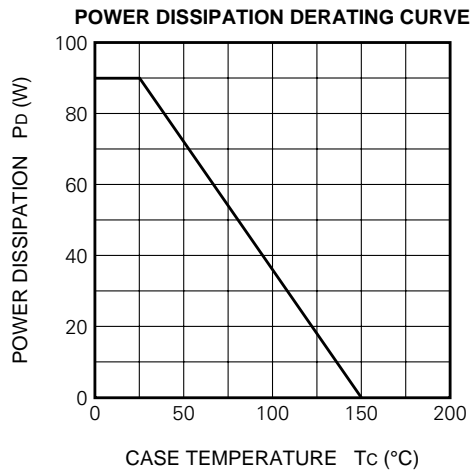
## MAXIMUM RATINGS (T<sub>c</sub> = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
$V_{DS}$	Drain-source voltage	$V_{GS} = 0V$	500	V
$V_{GS}$	Gate-source voltage	$V_{DS} = 0V$	$\pm 30$	V
$I_D$	Drain current		5	A
$I_{DM}$	Drain current (Pulsed)		15	A
$P_D$	Maximum power dissipation		90	W
$T_{ch}$	Channel temperature		-55 ~ +150	°C
$T_{stg}$	Storage temperature		-55 ~ +150	°C
—	Weight	Typical value	2.0	g

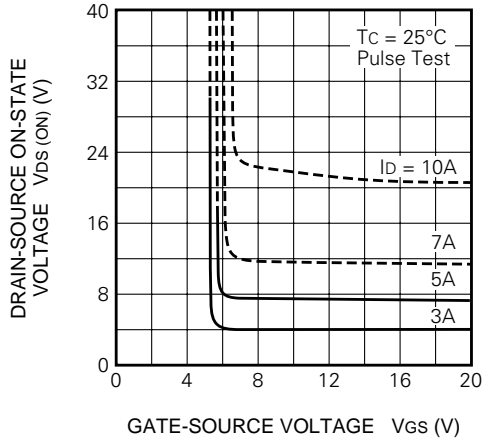
ELECTRICAL CHARACTERISTICS (T<sub>ch</sub> = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V (BR) DSS	Drain-source breakdown voltage	I <sub>D</sub> = 1mA, V <sub>GS</sub> = 0V	500	—	—	V
V (BR) GSS	Gate-source breakdown voltage	I <sub>G</sub> = ±100μA, V <sub>DS</sub> = 0V	±30	—	—	V
I <sub>GSS</sub>	Gate-source leakage current	V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V	—	—	±10	μA
I <sub>DSS</sub>	Drain-source leakage current	V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V	—	—	1	mA
V <sub>GS</sub> (th)	Gate-source threshold voltage	I <sub>D</sub> = 1mA, V <sub>DS</sub> = 10V	2	3	4	V
r <sub>DS</sub> (ON)	Drain-source on-state resistance	I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V	—	1.4	1.8	Ω
V <sub>DS</sub> (ON)	Drain-source on-state voltage	I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V	—	2.8	3.6	V
y <sub>fs</sub>	Forward transfer admittance	I <sub>D</sub> = 2A, V <sub>DS</sub> = 10V	1.8	3.0	—	S
C <sub>iss</sub>	Input capacitance	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz	—	600	—	pF
C <sub>oss</sub>	Output capacitance		—	80	—	pF
C <sub>rss</sub>	Reverse transfer capacitance		—	12	—	pF
t <sub>d</sub> (on)	Turn-on delay time	V <sub>DD</sub> = 200V, I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = R <sub>GS</sub> = 50Ω	—	15	—	ns
t <sub>r</sub>	Rise time		—	15	—	ns
t <sub>d</sub> (off)	Turn-off delay time		—	60	—	ns
t <sub>f</sub>	Fall time		—	30	—	ns
V <sub>SD</sub>	Source-drain voltage	I <sub>S</sub> = 2A, V <sub>GS</sub> = 0V	—	1.5	2.0	V
R <sub>th</sub> (ch-c)	Thermal resistance	Channel to case	—	—	1.39	°C/W

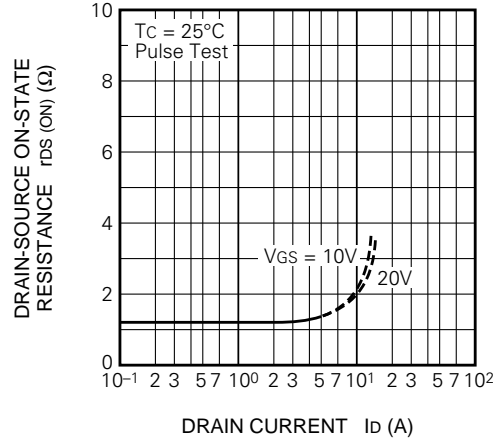
PERFORMANCE CURVES



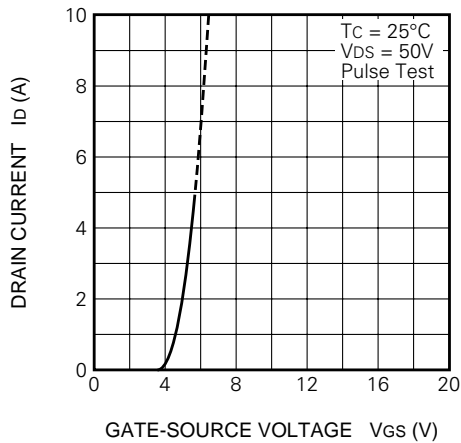
ON-STATE VOLTAGE VS.  
GATE-SOURCE VOLTAGE  
(TYPICAL)



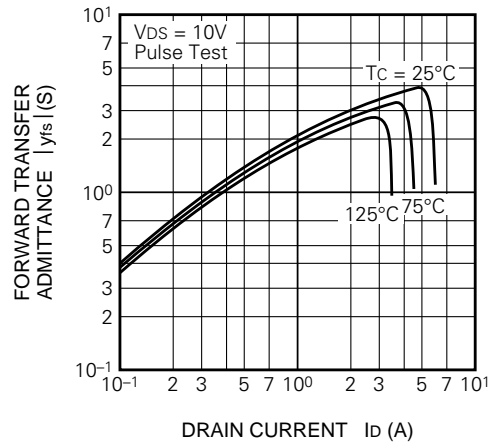
ON-STATE RESISTANCE VS.  
DRAIN CURRENT  
(TYPICAL)



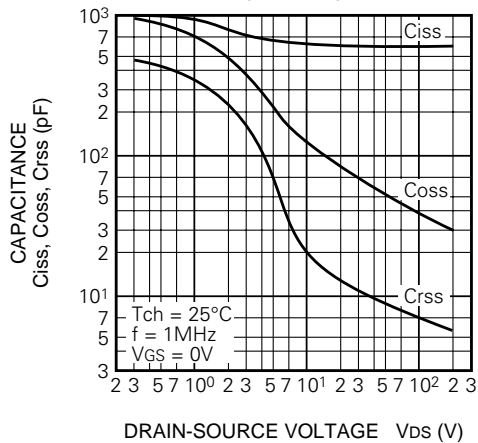
TRANSFER CHARACTERISTICS  
(TYPICAL)



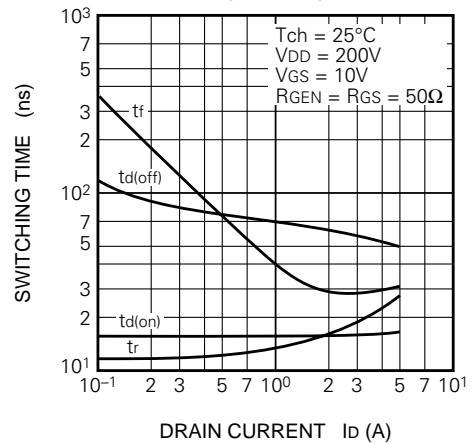
FORWARD TRANSFER ADMITTANCE  
VS. DRAIN CURRENT  
(TYPICAL)



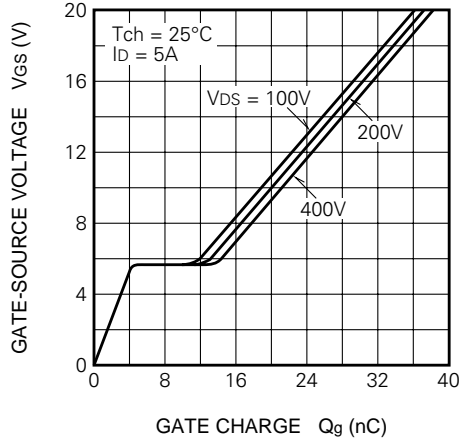
CAPACITANCE VS.  
DRAIN-SOURCE VOLTAGE  
(TYPICAL)



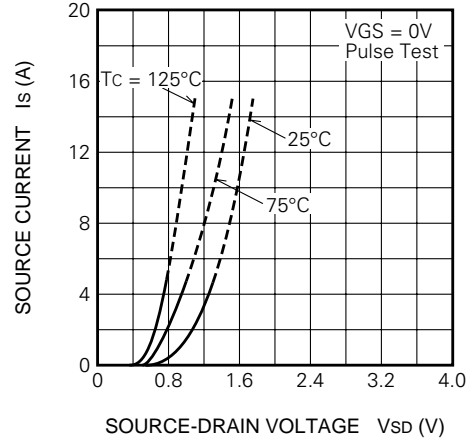
SWITCHING CHARACTERISTICS  
(TYPICAL)



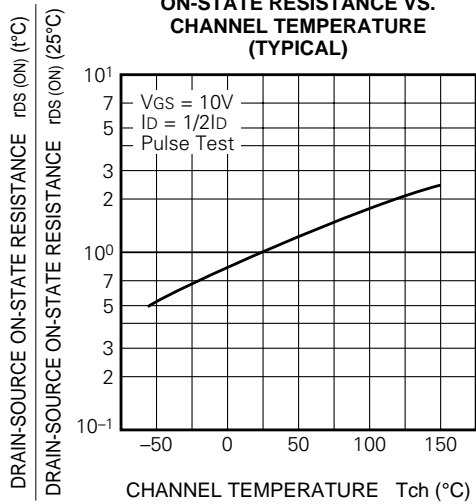
**GATE-SOURCE VOLTAGE  
VS. GATE CHARGE  
(TYPICAL)**



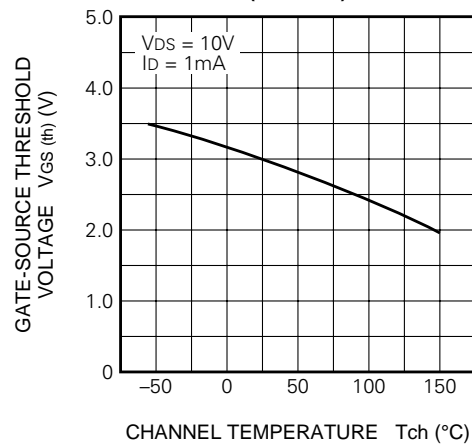
**SOURCE-DRAIN DIODE  
FORWARD CHARACTERISTICS  
(TYPICAL)**



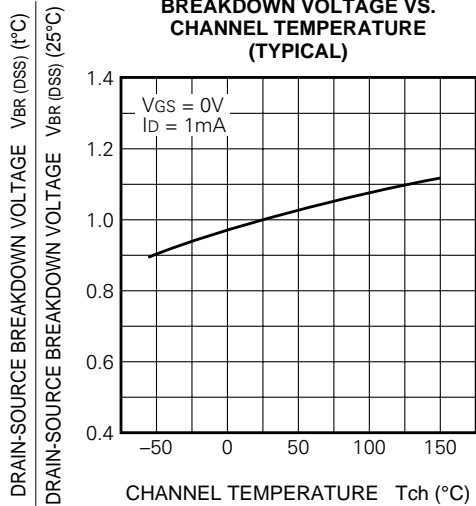
**ON-STATE RESISTANCE VS.  
CHANNEL TEMPERATURE  
(TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE  
CHARACTERISTICS**

