

# FS100SMJ-03

HIGH-SPEED SWITCHING USE

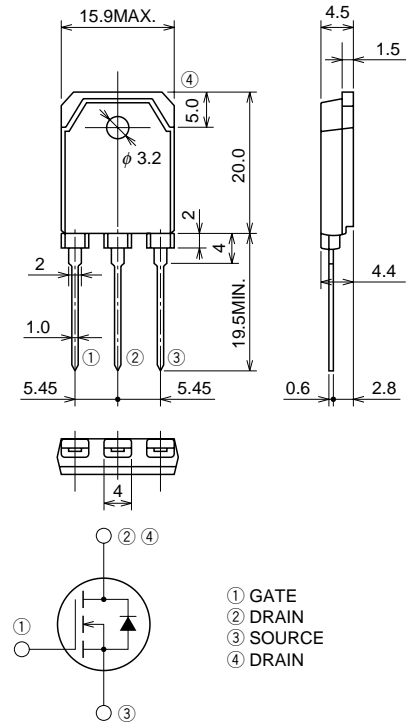
## FS100SMJ-03



- 4V DRIVE
- $V_{DSS}$  ..... 30V
- $r_{DS(ON)}$  (MAX) ..... 4.7m $\Omega$
- $I_D$  ..... 100A
- Integrated Fast Recovery Diode (TYP.) ..... 100ns

## OUTLINE DRAWING

Dimensions in mm



TO-3P

## APPLICATION

Motor control, Lamp control, Solenoid control  
DC-DC converter, etc.

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

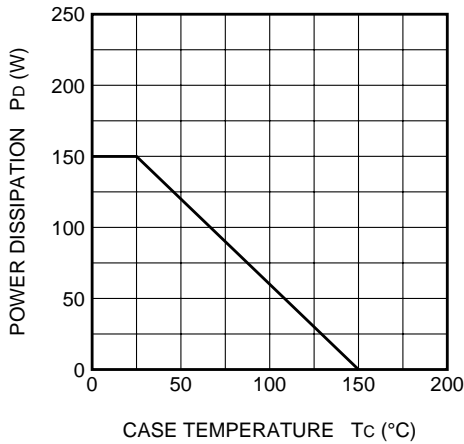
Symbol	Parameter	Conditions	Ratings	Unit
$V_{DSS}$	Drain-source voltage	$V_{GS} = 0V$	30	V
$V_{GSS}$	Gate-source voltage	$V_{DS} = 0V$	$\pm 20$	V
$I_D$	Drain current		100	A
$I_{DM}$	Drain current (Pulsed)		400	A
$I_{DA}$	Avalanche drain current (Pulsed)	$L = 30\mu H$	100	A
$I_S$	Source current		100	A
$I_{SM}$	Source current (Pulsed)		400	A
$P_D$	Maximum power dissipation		150	W
$T_{ch}$	Channel temperature		-55 ~ +150	°C
$T_{stg}$	Storage temperature		-55 ~ +150	°C
—	Weight	Typical value	4.8	g

**ELECTRICAL CHARACTERISTICS** (Tch = 25°C)

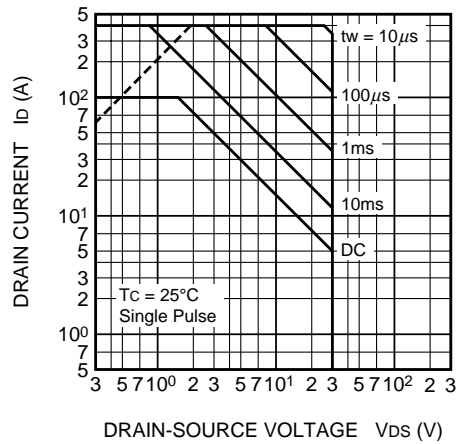
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V (BR) DSS	Drain-source breakdown voltage	ID = 1mA, VGS = 0V	30	—	—	V
IGSS	Gate-source leakage current	VGS = ±20V, VDS = 0V	—	—	±0.1	μA
IDSS	Drain-source leakage current	VDS = 30V, VGS = 0V	—	—	0.1	mA
VGS (th)	Gate-source threshold voltage	ID = 1mA, VDS = 10V	1.0	1.5	2.0	V
rDS (ON)	Drain-source on-state resistance	ID = 50A, VGS = 10V	—	3.5	4.7	mΩ
rDS (ON)	Drain-source on-state resistance	ID = 50A, VGS = 4V	—	4.7	8.0	mΩ
VDS (ON)	Drain-source on-state voltage	ID = 50A, VGS = 10V	—	0.175	0.235	V
yfs	Forward transfer admittance	ID = 50A, VDS = 10V	—	80	—	S
Ciss	Input capacitance	VDS = 10V, VGS = 0V, f = 1MHz	—	8000	—	pF
Coss	Output capacitance		—	2250	—	pF
Crss	Reverse transfer capacitance		—	1300	—	pF
td (on)	Turn-on delay time	VDD = 15V, ID = 50A, VGS = 10V, RGEN = RGS = 50Ω	—	55	—	ns
tr	Rise time		—	190	—	ns
td (off)	Turn-off delay time		—	800	—	ns
tf	Fall time		—	470	—	ns
VSD	Source-drain voltage	IS = 50A, VGS = 0V	—	1.0	1.5	V
Rth (ch-c)	Thermal resistance	Channel to case	—	—	0.83	°C/W
trr	Reverse recovery time	IS = 50A, dis/dt = -50A/μs	—	100	—	ns

**PERFORMANCE CURVES**

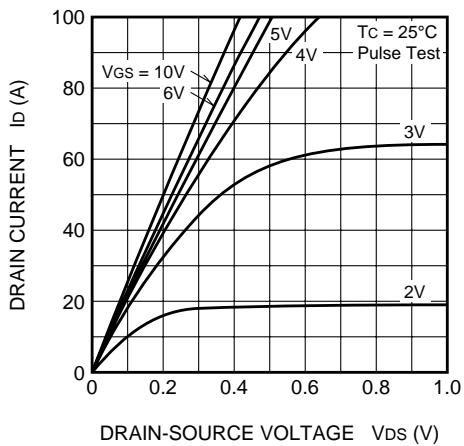
**POWER DISSIPATION DERATING CURVE**



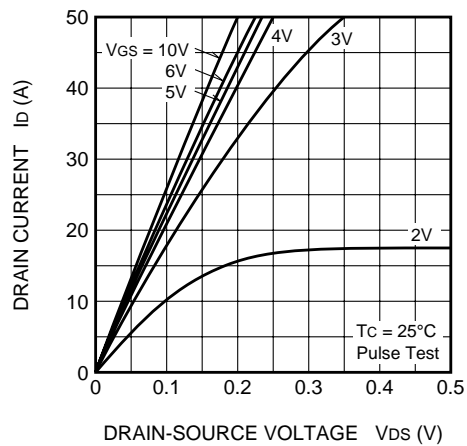
**MAXIMUM SAFE OPERATING AREA**



**OUTPUT CHARACTERISTICS (TYPICAL)**

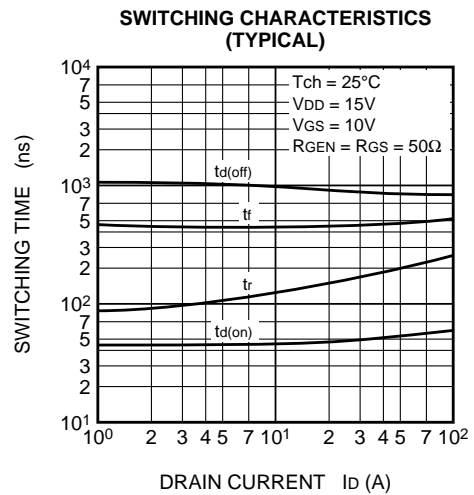
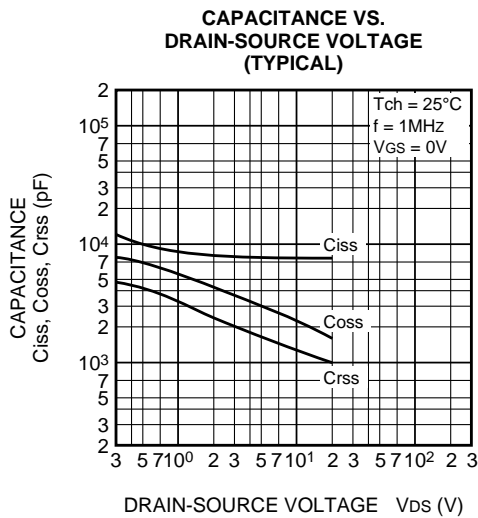
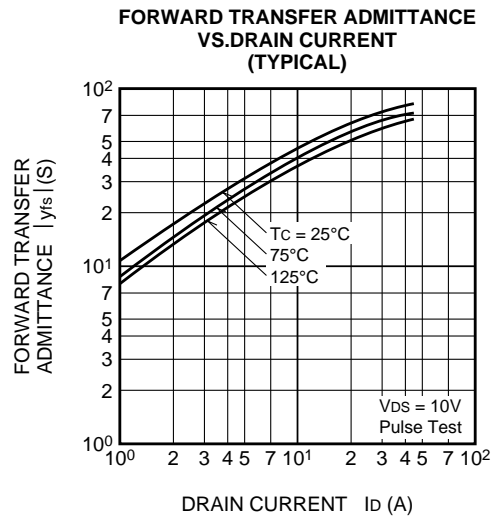
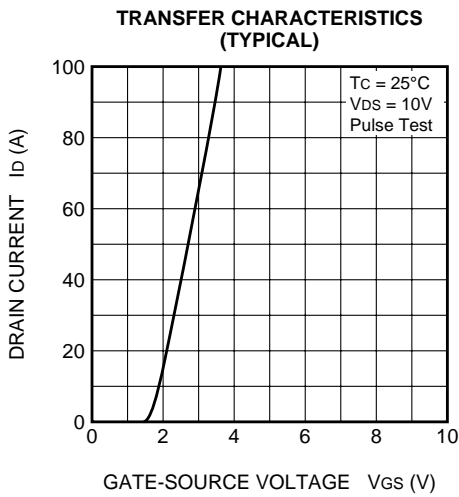
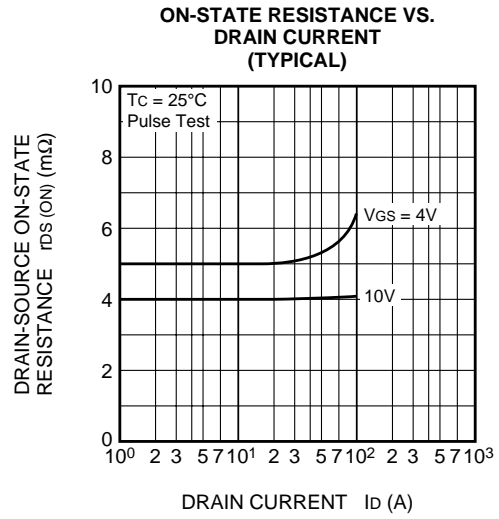
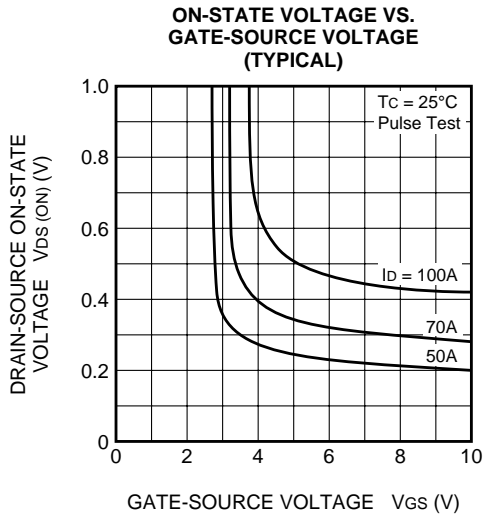


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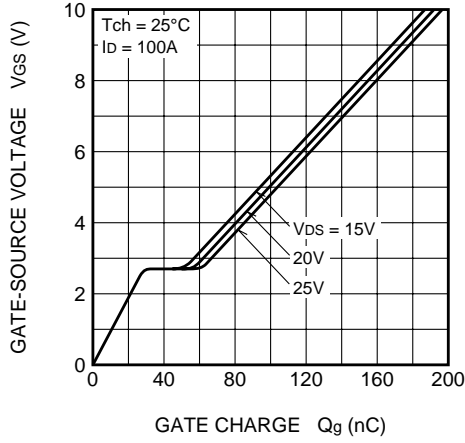


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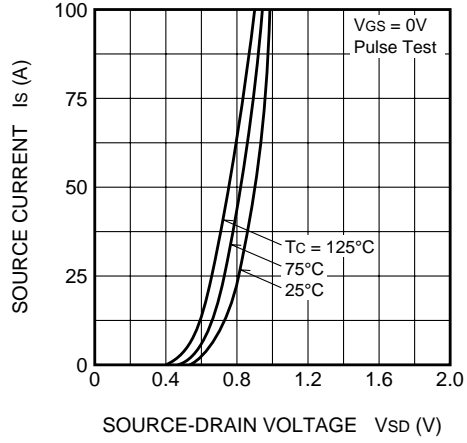
HIGH-SPEED SWITCHING USE



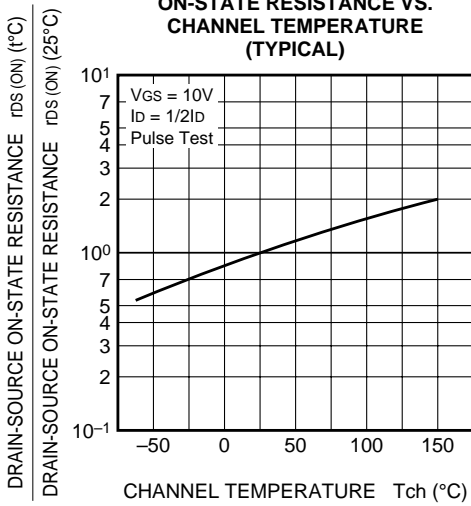
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



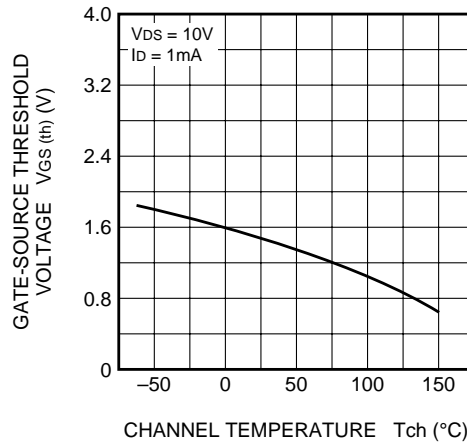
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



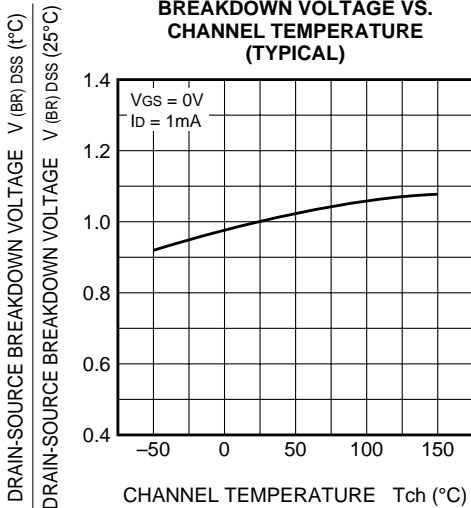
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

