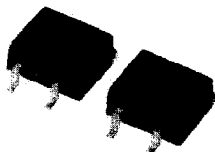


# FS50VSH-03

HIGH-SPEED SWITCHING USE

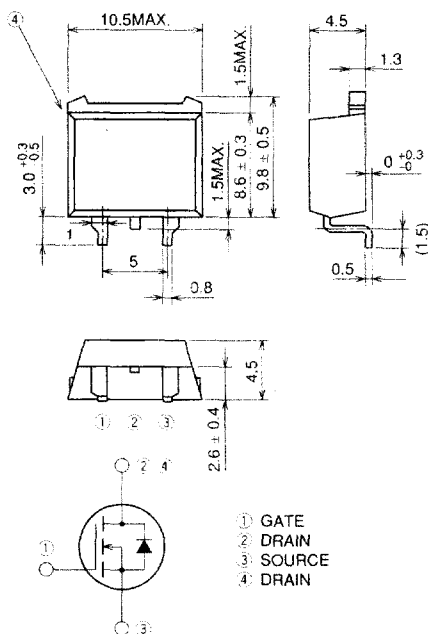
## FS50VSH-03



- 2.5V DRIVE
- V<sub>DSS</sub> ..... 30V
- r<sub>DS (ON)</sub> (MAX) ..... 22mΩ
- I<sub>D</sub> ..... 50A
- Integrated Fast Recovery Diode (TYP.) ..... 60ns

## OUTLINE DRAWING

Dimensions in mm



TO-220S

## 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 <sub>DSS</sub>	Drain-source voltage	V <sub>GS</sub> = 0V	30	V
V <sub>GSS</sub>	Gate-source voltage	V <sub>DS</sub> = 0V	±10	V
I <sub>D</sub>	Drain current		50	A
I <sub>DM</sub>	Drain current (Pulsed)		200	A
I <sub>DA</sub>	Avalanche drain current (Pulsed)	L = 30μH	50	A
I <sub>S</sub>	Source current		50	A
I <sub>SM</sub>	Source current (Pulsed)		200	A
P <sub>D</sub>	Maximum power dissipation		45	W
T <sub>ch</sub>	Channel temperature		-55 ~ +150	°C
T <sub>stg</sub>	Storage temperature		-55 ~ +150	°C
—	Weight	Typical value	1.2	g

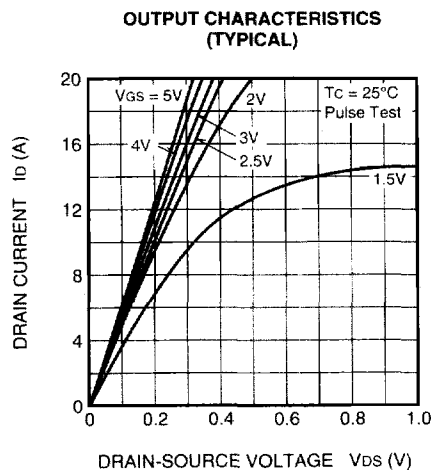
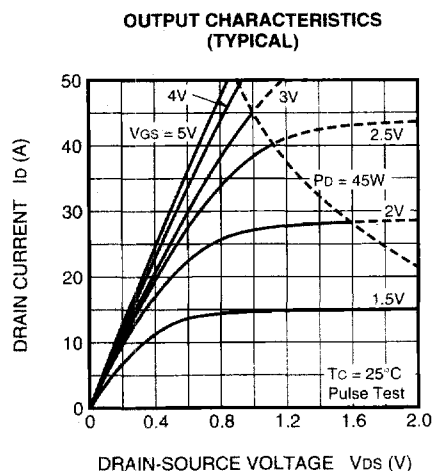
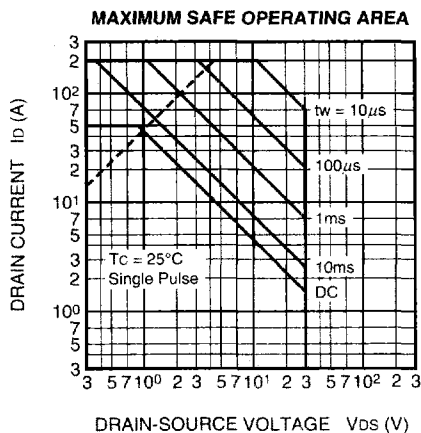
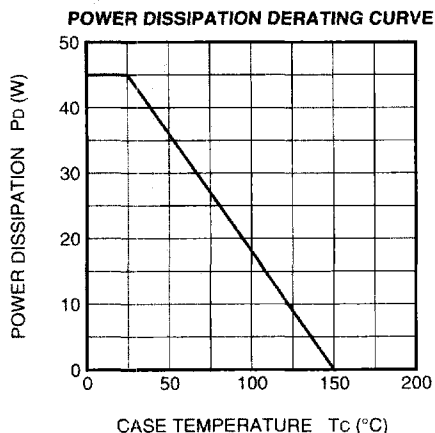
# FS50VSH-03

## HIGH-SPEED SWITCHING USE

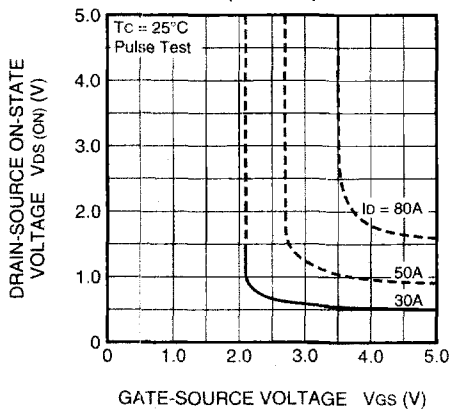
### ELECTRICAL CHARACTERISTICS (Tch = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V (BR) DSS	Drain-source breakdown voltage	ID = 1mA, VDS = 0V	30	—	—	V
IGSS	Gate leakage current	VGS = ±10V, VDS = 0V	—	—	±0.1	μA
IDSS	Drain current	VDS = 30V, VGS = 0V	—	—	0.1	mA
VGS (th)	Gate-source threshold voltage	ID = 1mA, VDS = 10V	0.6	0.9	1.2	V
rDS (ON)	Drain-source on-state resistance	ID = 25A, VGS = 4V	—	17	22	mΩ
rDS (ON)	Drain-source on-state resistance	ID = 25A, VGS = 2.5V	—	21	33	mΩ
VDS (ON)	Drain-source on-state voltage	ID = 25A, VGS = 4V	—	0.425	0.55	V
Yfs	Forward transfer admittance	ID = 25A, VDS = 10V	—	40	—	S
Ciss	Input capacitance	VDS = 10V, VGS = 0V, f = 1MHz	—	2300	—	pF
Coss	Output capacitance		—	500	—	pF
Crss	Reverse transfer capacitance		—	260	—	pF
td (on)	Turn-on delay time	VDD = 15V, ID = 25A, VGS = 4V, RGEN = RGS = 50Ω	—	35	—	ns
tr	Rise time		—	170	—	ns
td (off)	Turn-off delay time		—	200	—	ns
tf	Fall time		—	230	—	ns
VSD	Source-drain voltage	IS = 25A, VGS = 0V	—	1.0	1.5	V
Rth (ch-c)	Thermal resistance	Channel to case	—	—	2.78	°C/W
trr	Reverse recovery time	IS = 25A, dis/dt = -50A/μs	—	60	—	ns

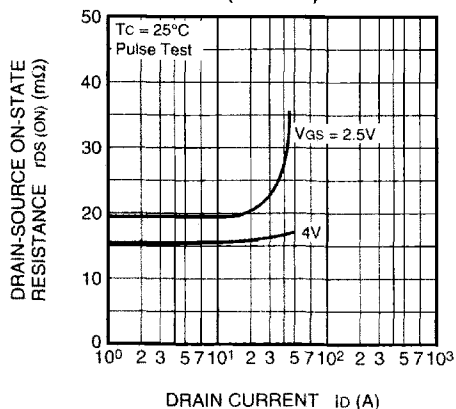
### PERFORMANCE CURVES



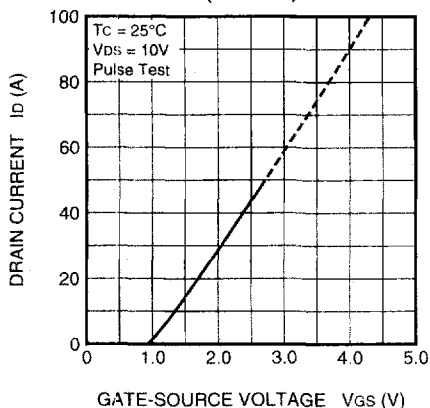
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



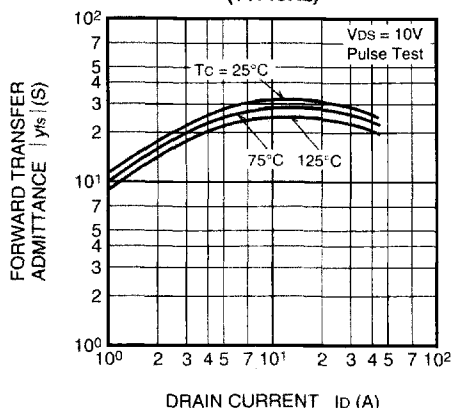
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



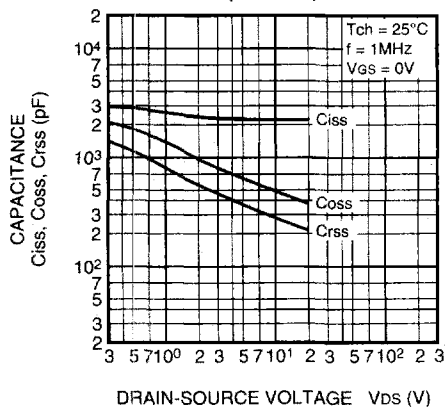
TRANSFER CHARACTERISTICS (TYPICAL)



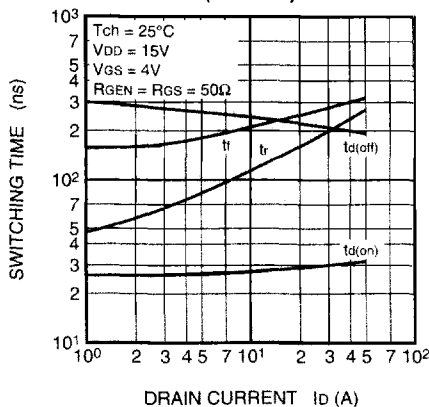
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



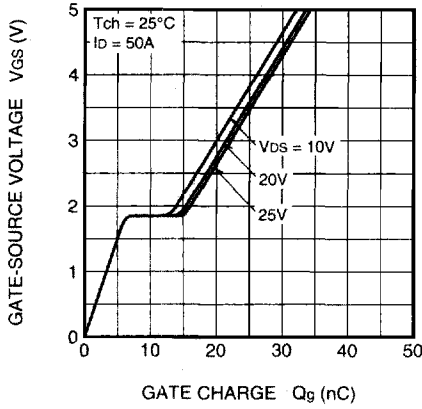
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



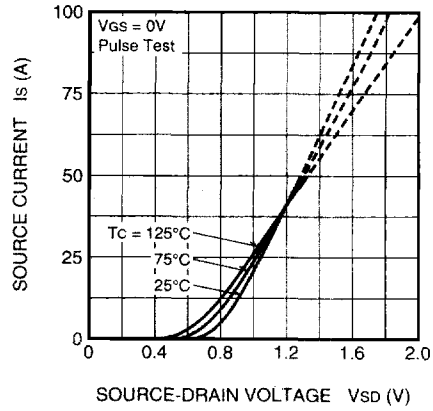
SWITCHING CHARACTERISTICS (TYPICAL)



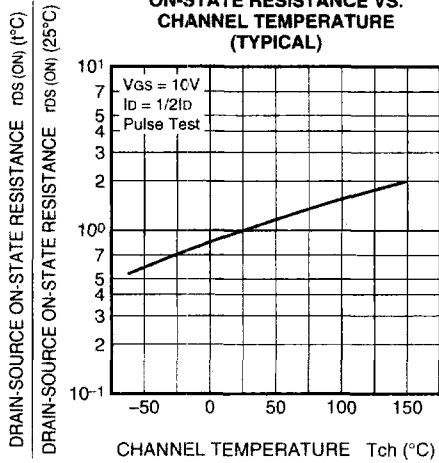
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



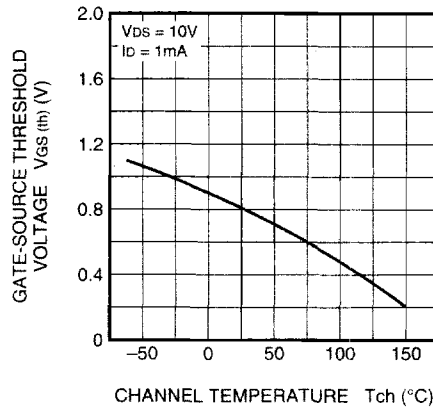
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



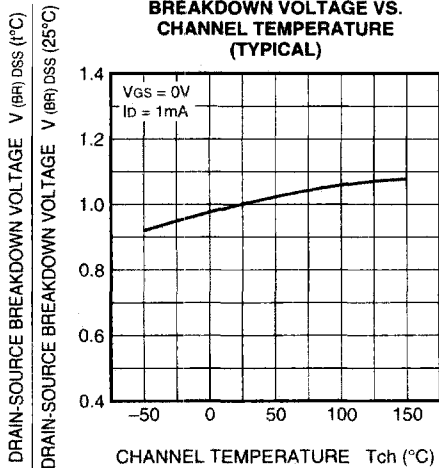
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

