

FS50SM-3

HIGH-SPEED SWITCHING USE

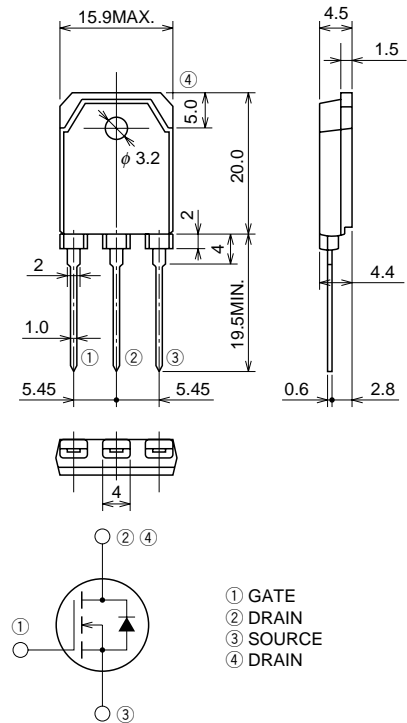
FS50SM-3



- 10V DRIVE
- V_{DS} 150V
- $r_{DS(ON)}$ (MAX) 31m Ω
- I_D 50A
- Integrated Fast Recovery Diode (TYP.) 130ns

OUTLINE DRAWING

Dimensions in mm



TO-3P

APPLICATION

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

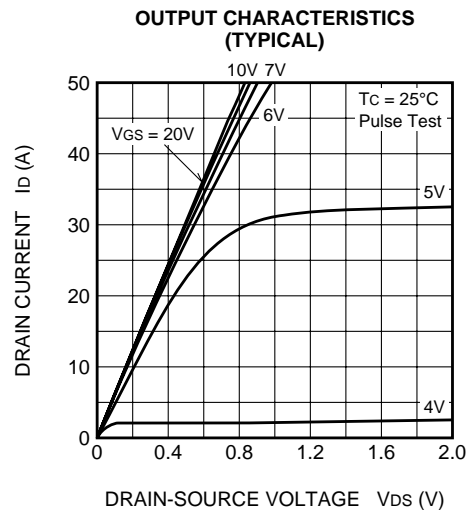
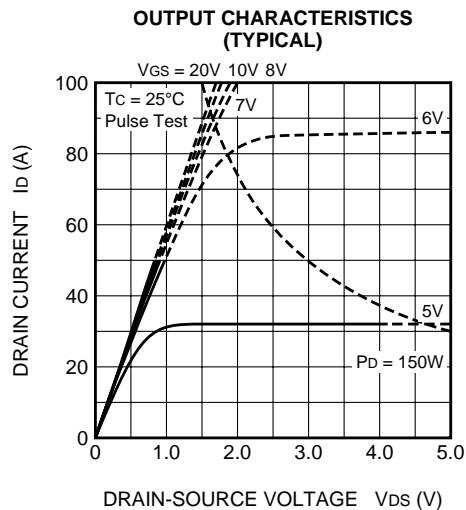
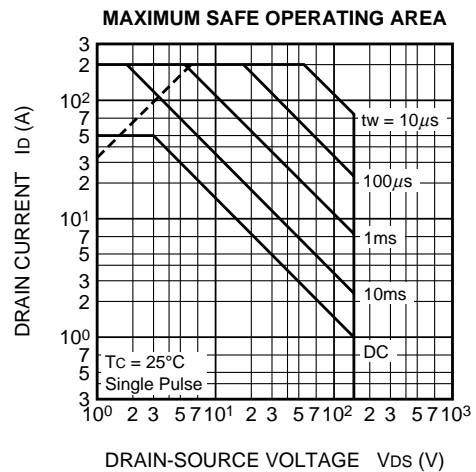
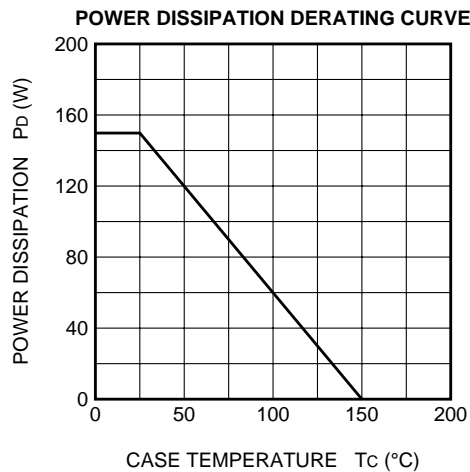
MAXIMUM RATINGS (T_c = 25°C)

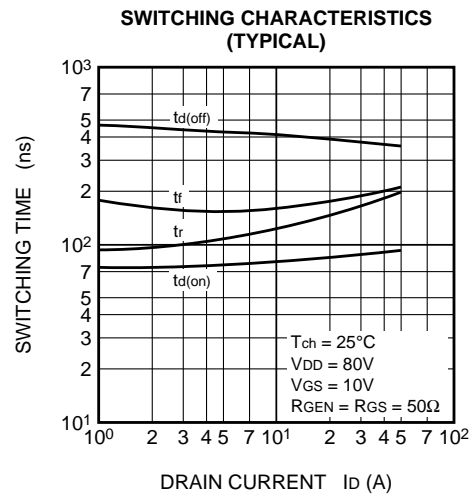
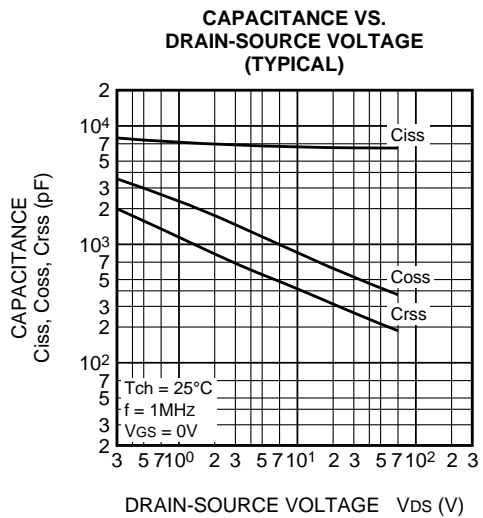
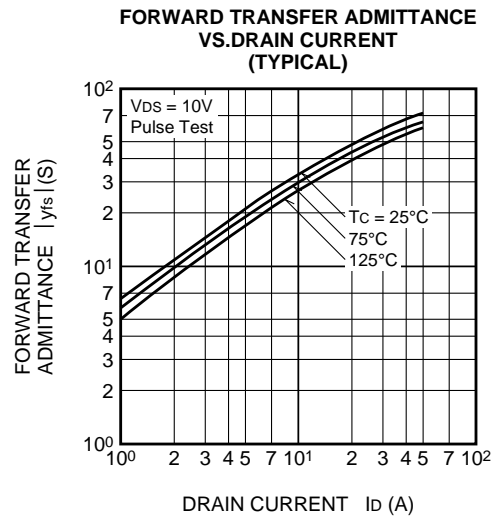
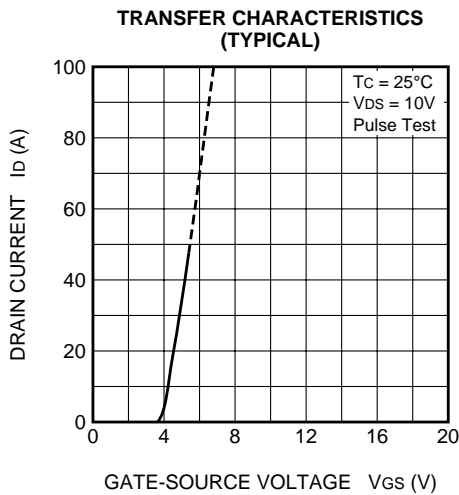
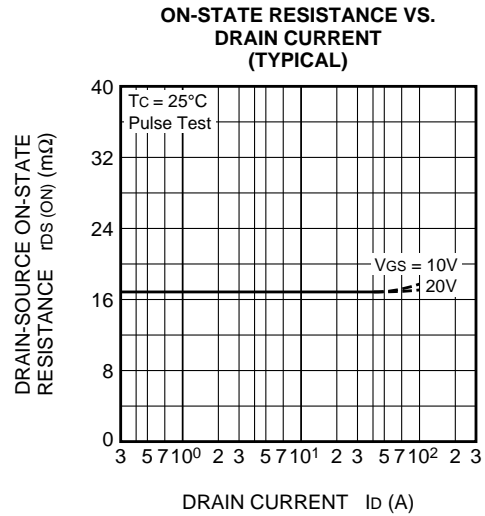
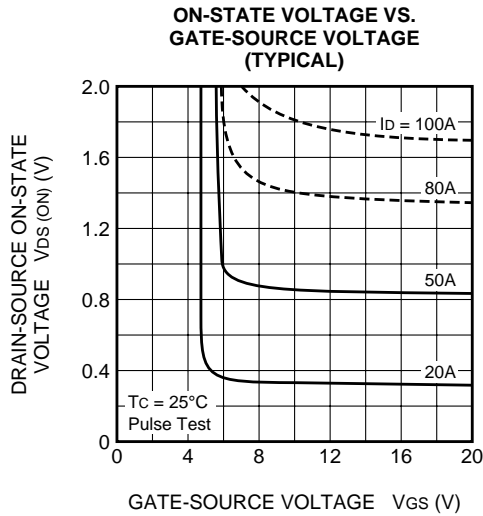
Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	150	V
V_{GS}	Gate-source voltage	$V_{DS} = 0V$	± 20	V
I_D	Drain current		50	A
I_{DM}	Drain current (Pulsed)		200	A
I_{DA}	Avalanche drain current (Pulsed)	$L = 100\mu H$	50	A
I_S	Source current		50	A
I_{SM}	Source current (Pulsed)		200	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 (T_{ch} = 25°C)

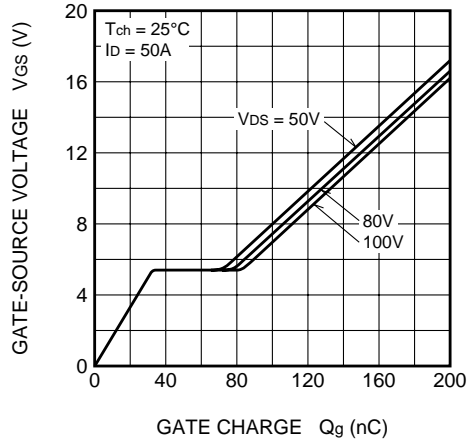
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V _{(BR)DSS}	Drain-source breakdown voltage	I _D = 1mA, V _{GS} = 0V	150	—	—	V
I _{GSS}	Gate-source leakage current	V _{GS} = ±20V, V _{DS} = 0V	—	—	±0.1	μA
I _{DSS}	Drain-source leakage current	V _{DS} = 150V, V _{GS} = 0V	—	—	0.1	mA
V _{GS(th)}	Gate-source threshold voltage	I _D = 1mA, V _{DS} = 10V	2.0	3.0	4.0	V
r _{DS(on)}	Drain-source on-state resistance	I _D = 25A, V _{GS} = 10V	—	24	31	mΩ
V _{DS(on)}	Drain-source on-state voltage	I _D = 25A, V _{GS} = 10V	—	0.600	0.775	V
y _{fs}	Forward transfer admittance	I _D = 25A, V _{DS} = 10V	—	55	—	S
C _{iss}	Input capacitance	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz	—	6540	—	pF
C _{oss}	Output capacitance		—	860	—	pF
C _{rss}	Reverse transfer capacitance		—	360	—	pF
t _{d(on)}	Turn-on delay time	V _{DD} = 80V, I _D = 25A, V _{GS} = 10V, R _{GEN} = R _{GS} = 50Ω	—	95	—	ns
t _r	Rise time		—	155	—	ns
t _{d(off)}	Turn-off delay time		—	380	—	ns
t _f	Fall time		—	180	—	ns
V _{SD}	Source-drain voltage	I _S = 25A, V _{GS} = 0V	—	1.0	1.5	V
R _{th(ch-c)}	Thermal resistance	Channel to case	—	—	0.83	°C/W
t _{rr}	Reverse recovery time	I _S = 50A, di _s /dt = -100A/μs	—	130	—	ns

PERFORMANCE CURVES

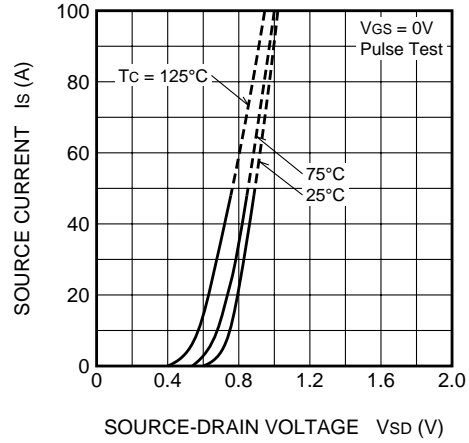




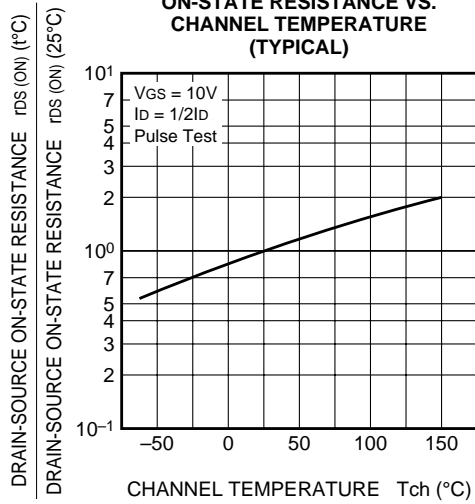
GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)



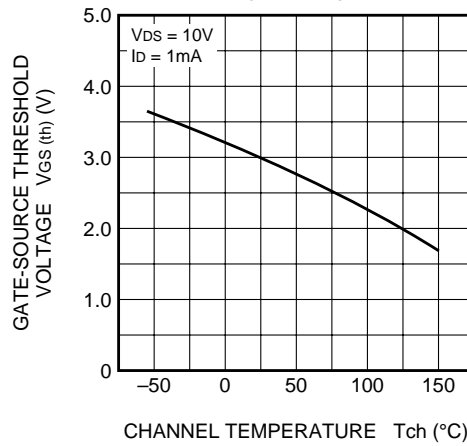
SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



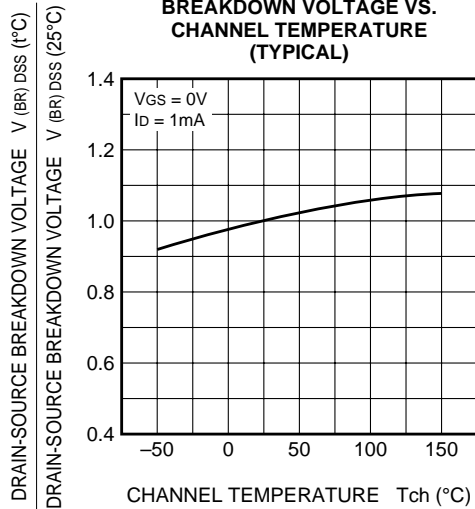
ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)



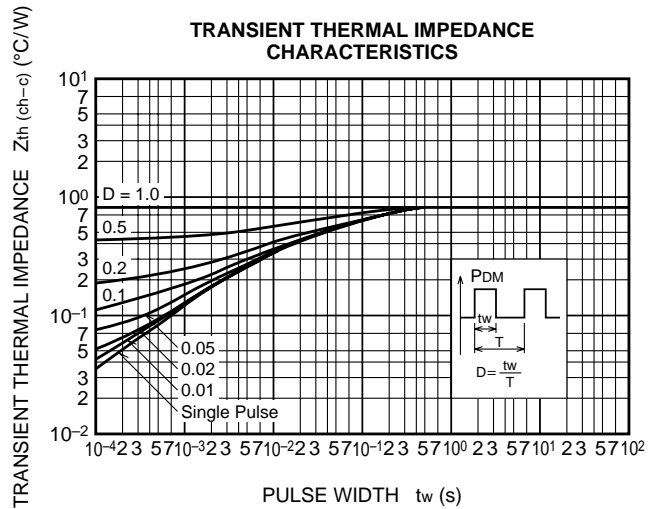
THRESHOLD VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



BREAKDOWN VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS



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