

FS40SM-6

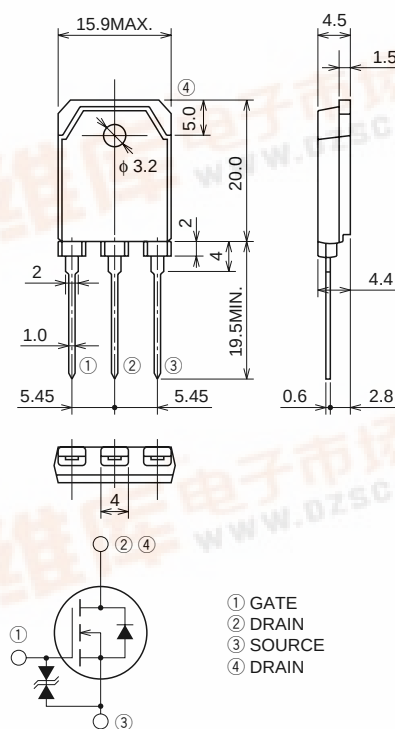
HIGH-SPEED SWITCHING USE

FS40SM-6



OUTLINE DRAWING

Dimensions in mm



TO-3P

APPLICATION

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

MAXIMUM RATINGS (Tc = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	300	V
V_{GS}	Gate-source voltage	$V_{DS} = 0V$	± 30	V
I_D	Drain current		40	A
I_{DM}	Drain current (Pulsed)		120	A
P_D	Maximum power dissipation		275	W
T_{ch}	Channel temperature		$-55 \sim +150$	°C
T_{stg}	Storage temperature		$-55 \sim +150$	°C
—	Weight	Typical value	4.8	g

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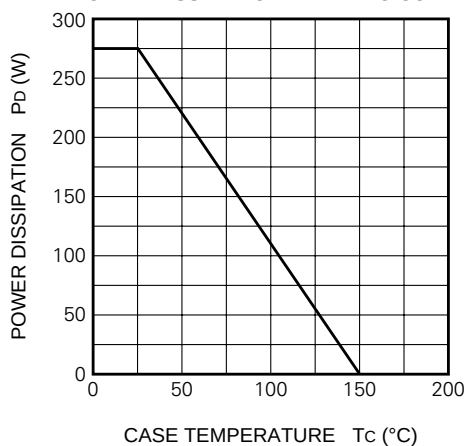
HIGH-SPEED SWITCHING USE

ELECTRICAL CHARACTERISTICS (T_{ch} = 25°C)

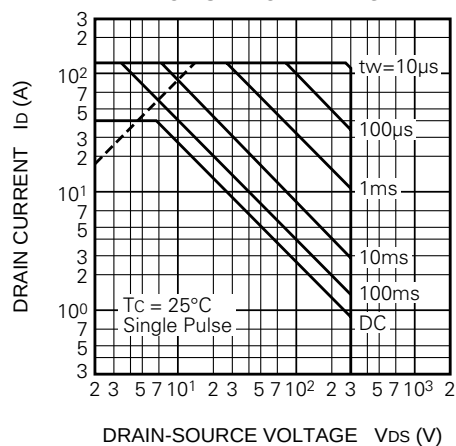
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V _{(BR)DSS}	Drain-source breakdown voltage	I _D = 1mA, V _{GS} = 0V	300	—	—	V
V _{(BR)GSS}	Gate-source breakdown voltage	I _G = ±100μA, V _{DS} = 0V	±30	—	—	V
I _{GSS}	Gate-source leakage current	V _{GS} = ±25V, V _{DS} = 0V	—	—	±10	μA
I _{DSS}	Drain-source leakage current	V _{DS} = 300V, V _{GS} = 0V	—	—	1	mA
V _{GS(th)}	Gate-source threshold voltage	I _D = 1mA, V _{DS} = 10V	2	3	4	V
r _{DS(ON)}	Drain-source on-state resistance	I _D = 20A, V _{GS} = 10V	—	0.088	0.114	Ω
V _{DS(ON)}	Drain-source on-state voltage	I _D = 20A, V _{GS} = 10V	—	1.76	2.28	V
y _{fs}	Forward transfer admittance	I _D = 20A, V _{DS} = 10V	12.0	18.0	—	S
C _{iss}	Input capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz	—	2850	—	pF
C _{oss}	Output capacitance		—	580	—	pF
C _{rss}	Reverse transfer capacitance		—	110	—	pF
t _{d(on)}	Turn-on delay time	V _{DD} = 150V, I _D = 20A, V _{GS} = 10V, R _{GEN} = R _{GS} = 50Ω	—	45	—	ns
t _r	Rise time		—	125	—	ns
t _{d(off)}	Turn-off delay time		—	310	—	ns
t _f	Fall time		—	140	—	ns
V _{SD}	Source-drain voltage	I _S = 20A, V _{GS} = 0V	—	1.5	2.0	V
R _{th(ch-c)}	Thermal resistance	Channel to case	—	—	0.45	°C/W

PERFORMANCE CURVES

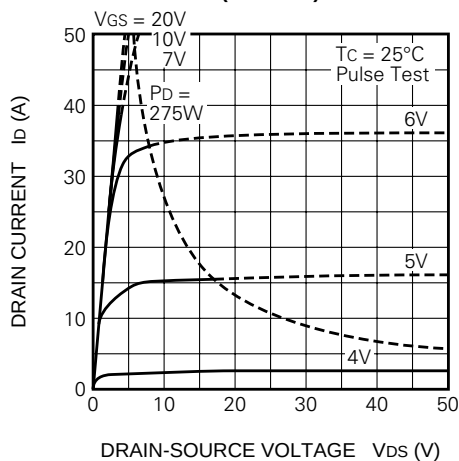
POWER DISSIPATION DERATING CURVE



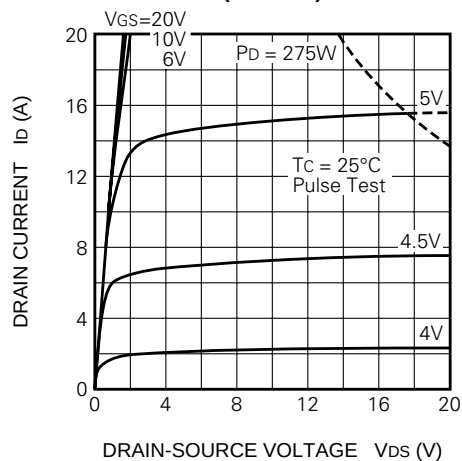
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)

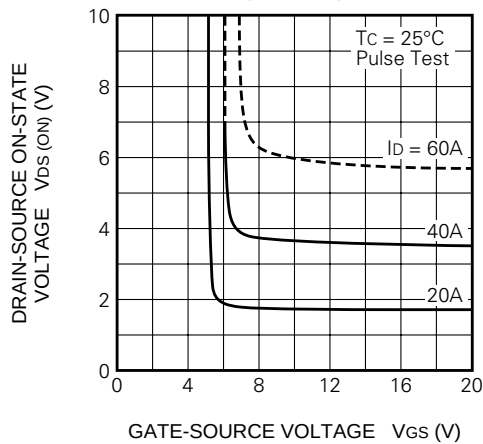
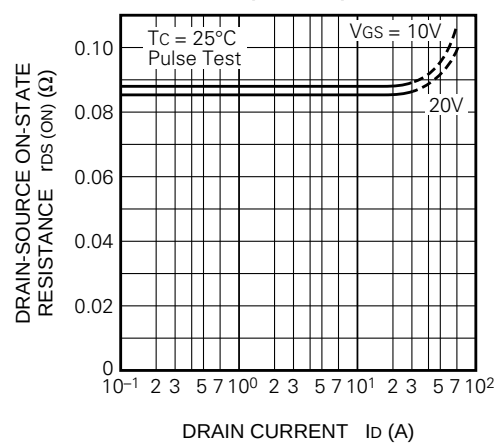
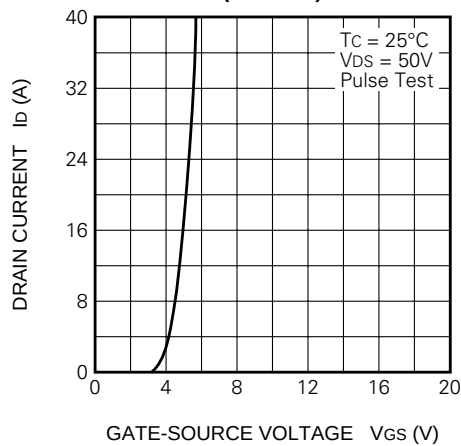
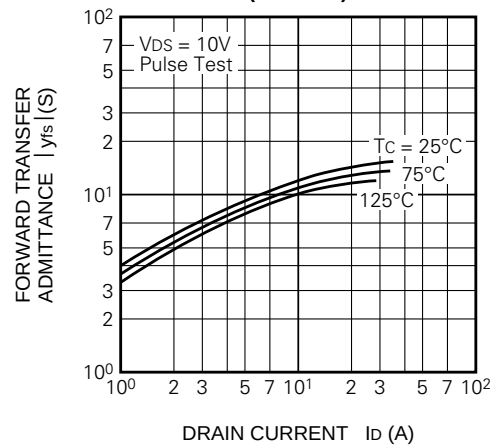
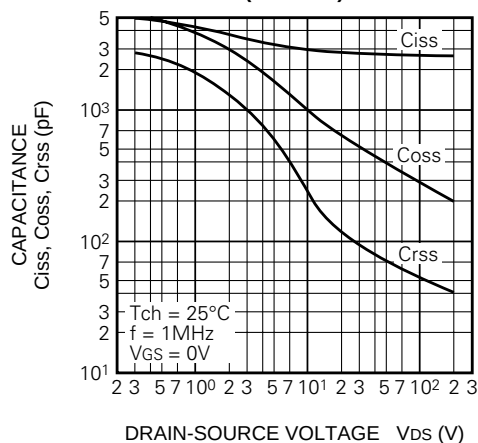
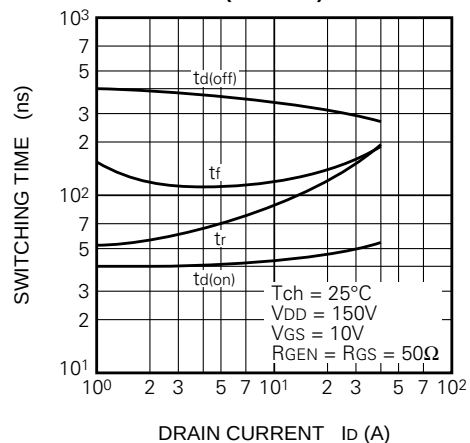


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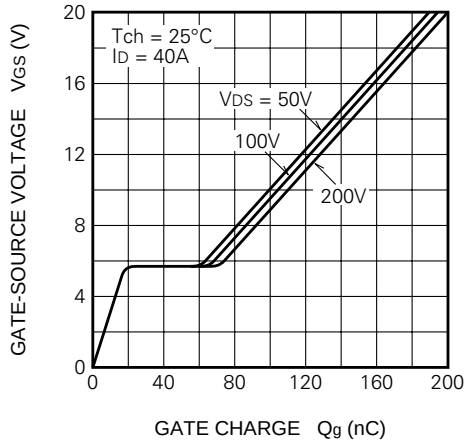


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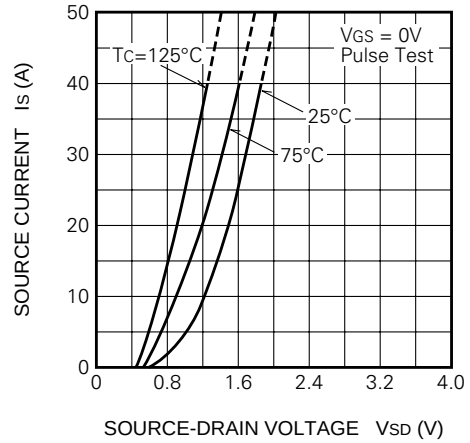
HIGH-SPEED SWITCHING USE

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)

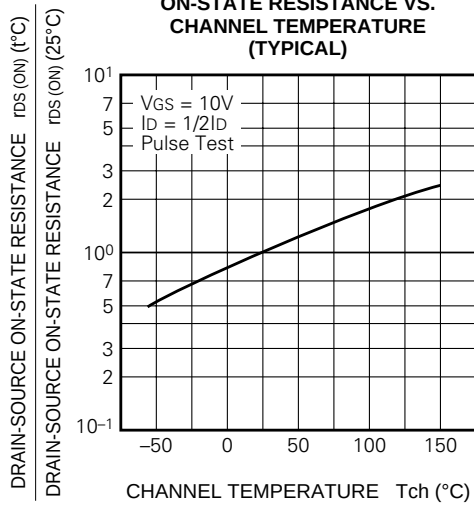
GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)



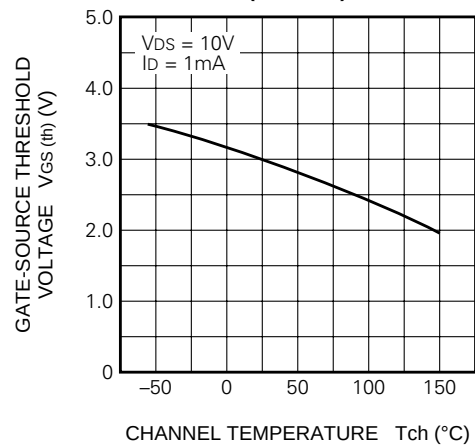
SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



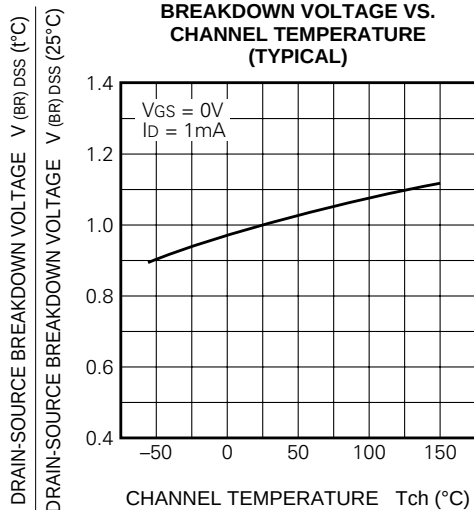
ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)



THRESHOLD VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



BREAKDOWN VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS

