

GSMF08N60M

600V N-Channel MOSFETs

Product Description

These N-Channel enhancement mode power field effect transistors are using advanced super junction technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency switch mode power supply.

Features

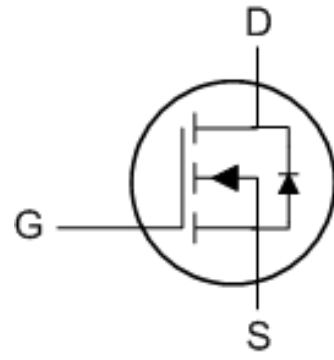
- 600V, 7.5A, $R_{DS(ON)}=1.2\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- TO-220F package design

Applications

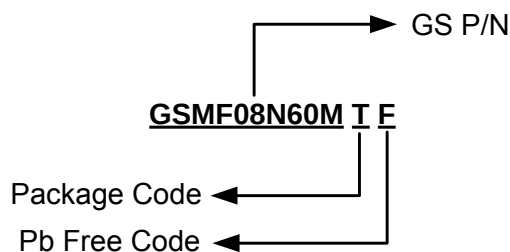
- High efficient switched mode power supplies
- TV / Monitor
- Adapter / charger
- Server Power
- PV Inverter / UPS

Packages & Pin Assignments

GSMF08N60MTF (TO-220F)	
 Top View	
Pin	Description
1	Gate
2	Drain
3	Source

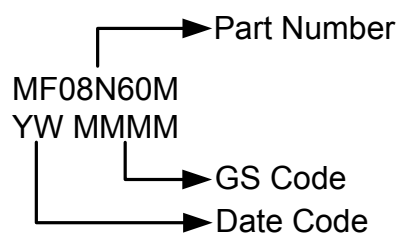


Ordering Information



Part Number	Package	Quantity Tube
GSMF08N60MTF	TO-220F	50 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$ Unless otherwise noted

Symbol	Parameter		Typical	Unit
V _{DS}	Drain-Source Voltage		600	V
V _{GS}	Gate-Source Voltage		±30	V
I _D	Continuous Drain Current	T _C =25°C	7.5	A
		T _C =100°C	4.4	
I _{DM}	Pulsed Drain Current (Note 1)		28	A
EAS	Single Pulse Avalanche Energy (Note 2)		245	mJ
IAS	Single Pulse Avalanche Current (Note 2)		7	A
P _D	Power Dissipation (T _C =25°C)		36.8	W
	Power Dissipation (Derate above 25°C)		0.29	W/°C
T _J	Operating Junction Temperature Range		-55 to +150	°C
T _{STG}	Storage Temperature Range		-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient		62	°C/W
R _{θJC}	Thermal Resistance-Junction to Case		3.4	°C/W

Note 1: Repetitive Rating: Pulsed width limited by maximum junction temperature.

Note 2: $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=10\text{mH}$, $I_{AS}=7\text{A}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.

Electrical Characteristics

$T_J=25^{\circ}\text{C}$ Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V,I _D =250uA	600			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250uA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V,V _{GS} =±30V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V,V _{GS} =0V T _J =25℃			1	uA
		V _{DS} =480V,V _{GS} =0V, T _J =100℃			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			7	A
I _{SM}	Pulsed Source Current				14	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V,I _D =3A		1.0	1.2	Ω
g _{FS}	Forward Transconductance	V _{DS} =30V,I _D =3A		8		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =1A T _J =25℃			1	V
Dynamic						
Q _g	Total Gate Charge (Note 3,4)	V _{DS} =480V,V _{GS} =10V, I _D =4A		29	45	nC
Q _{gs}	Gate-Source Charge (Note 3,4)			5	8	
Q _{gd}	Gate-Drain Charge (Note 3,4)			11.5	18	
C _{iss}	Input Capacitance	V _{DS} =25V,V _{GS} =0V, f=1MHz		920	1350	pF
C _{oss}	Output Capacitance			97	150	
C _{rss}	Reverse Transfer Capacitance			15	30	
t _{d(on)}	Turn-On Time (Note 3,4)	V _{DD} =300V,I _D =4A, V _{GS} =10V,R _G =25Ω		26	52	ns
t _r				30	60	
t _{d(off)}	Turn-Off Time (Note 3,4)			68	136	
t _f				25	50	
R _g	Gate Resistance	V _{DS} =0V,V _{GS} =0V, f=1MHz		2.3	4.6	Ω

Note 3: The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

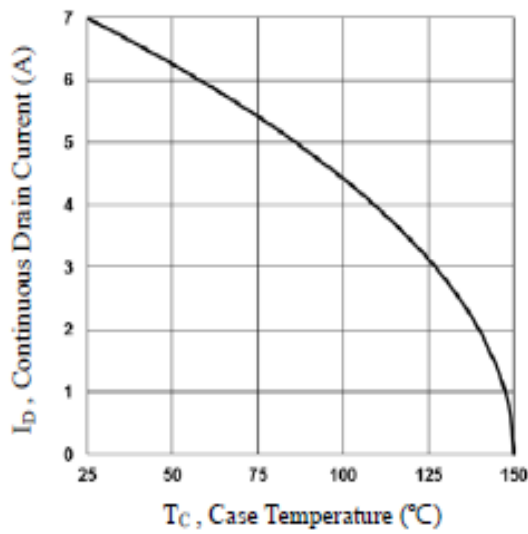


Fig.1 Continuous Drain Current vs. T_C

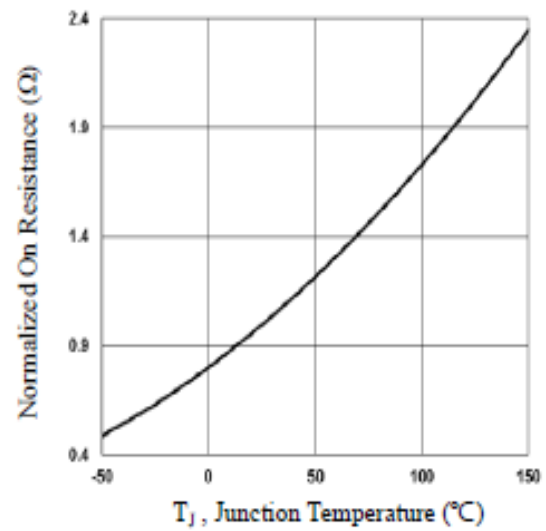


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

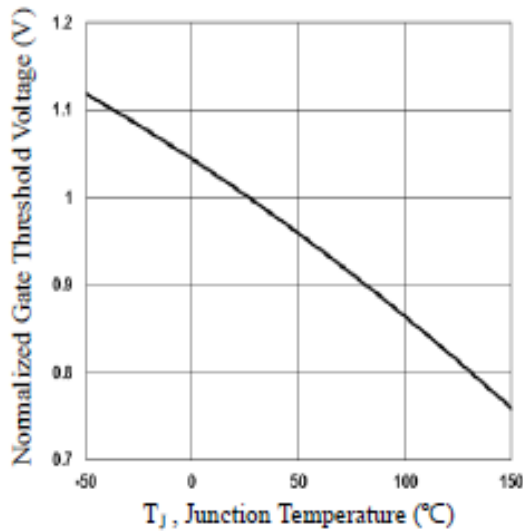


Fig.3 Normalized V_{th} vs. T_J

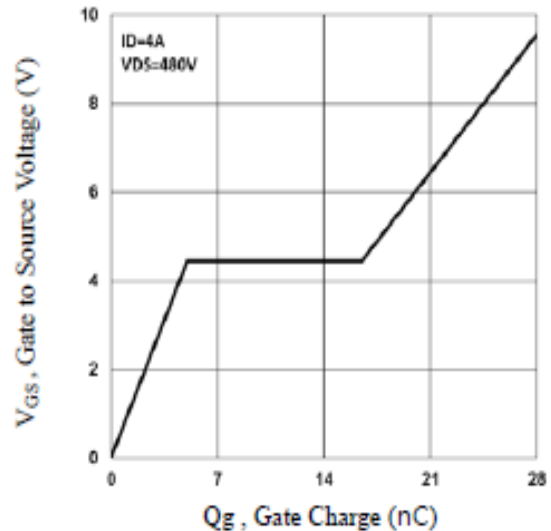


Fig.4 Gate Charge Waveform

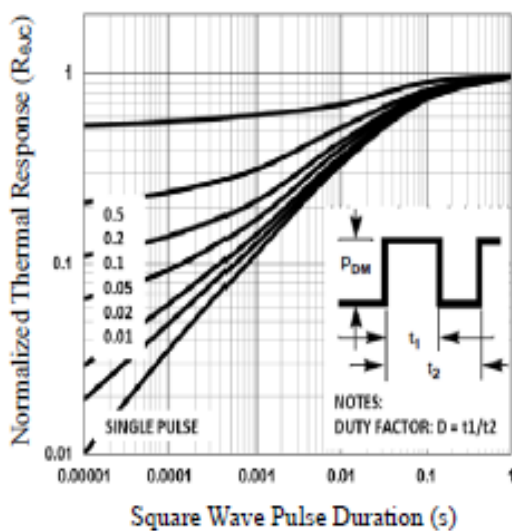


Fig.5 Normalized Transient Impedance

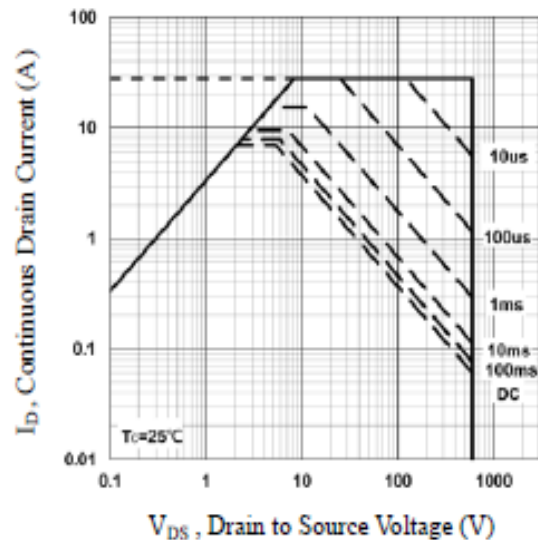
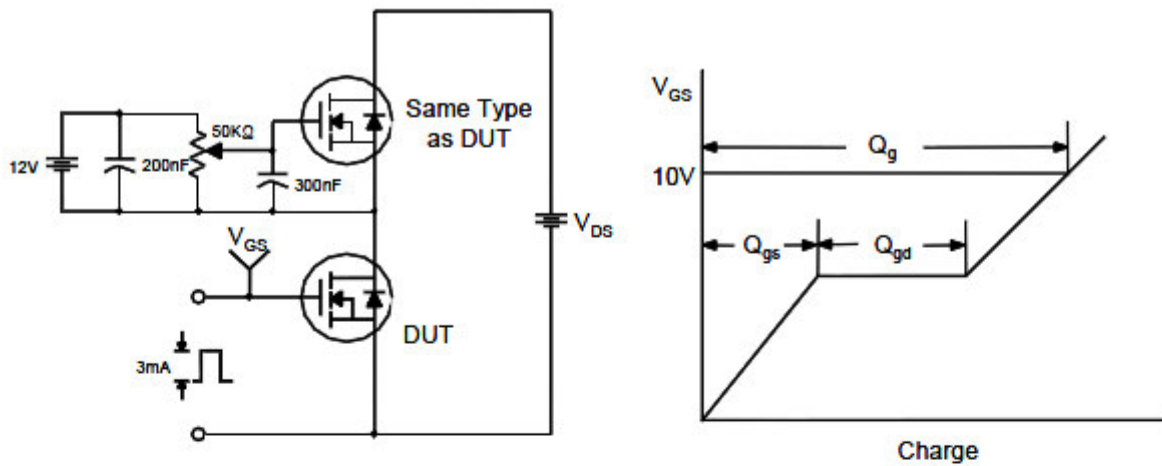


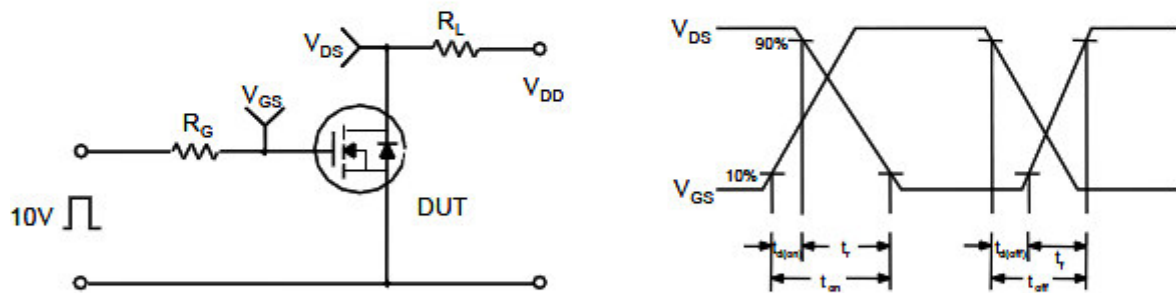
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

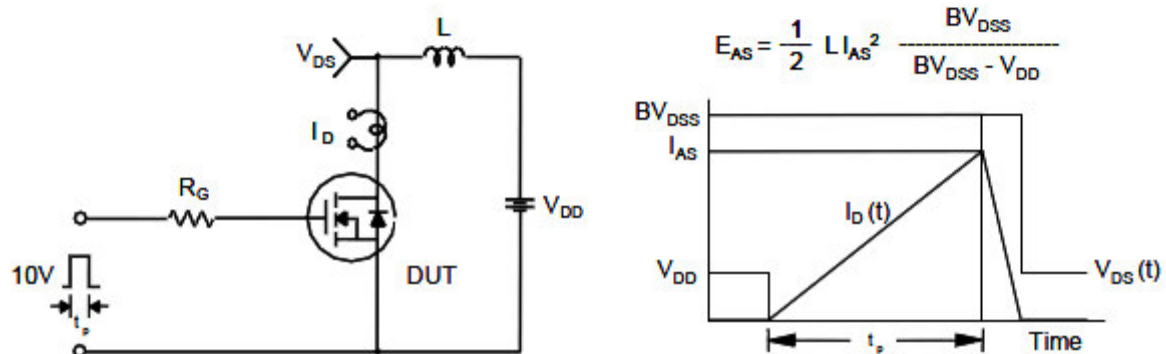
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

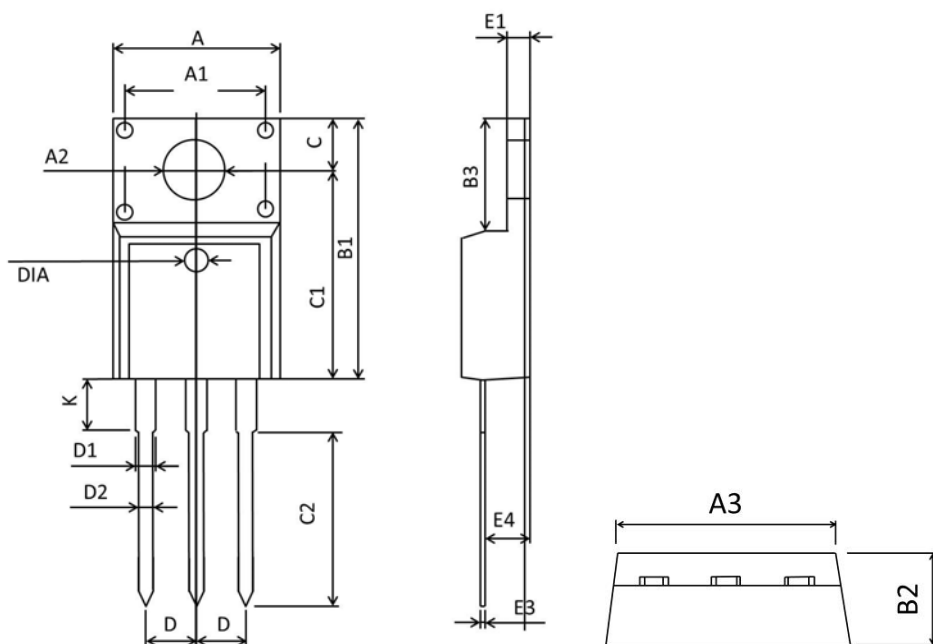


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

TO-220F



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.860	10.460	0.389	0.411
A1	6.900	7.100	0.272	0.279
A2	3.100	3.500	0.123	0.137
B1	15.57	16.17	0.613	0.636
B2	4.500	4.900	0.178	0.192
B3	6.480	6.880	0.256	0.271
C	3.100	3.500	0.123	0.137
C1	12.270	12.870	0.484	0.506
C2	9.600	10.60	0.378	0.417
D	2.490	2.590	0.099	0.101
D1	1.070	1.470	0.043	0.057
D2	0.700	0.900	0.028	0.035
K	2.900	3.300	0.115	0.129
E1	2.340	2.740	0.093	0.107
E3	0.400	0.600	0.016	0.023
E4	2.560	2.960	0.101	0.116
DIA	1.45	1.55	0.058	0.061

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