



N-CHANNEL POWER MOSFET MEM12N60

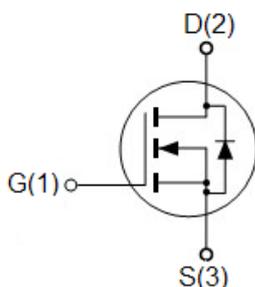
General Description

The MEM12N60 is a high voltage and high current power MOSFET, designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in powersupplies, PWM motor controls, high efficient DC to DC converters and bridge circuits

Features

- 600V, 12A
- $R_{DS(ON)}=0.7\Omega@V_{GS}=10V$
- LOW Crss
- Fast Switching
- Avalanche energy specified
- Package : TO220-F

Pin Configuration



Maximum Ratings(T_A=25°C)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	600V	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	$T_A=25^\circ C$	I_D	12 ▲	A
	$T_A=100^\circ C$		7.4 ▲	
Pulsed Drain Current ^{1,2}		I_{DM}	48 ▲	A
Total Power Dissipation	$T_A=25^\circ C$	P_d	50	W
Operating Temperature Range		T_{Opr}	-55-150	°C
Storage Temperature Range		T_{stg}	-55-150	°C

▲ Drain current limited by maximum junction temperature.

Thermal Characteristics

Parameter	Symbol	TYP.	MAX.	Unit
Thermal Resistance, Junction-to-Case	R θ JC	2.4	3	°C/W

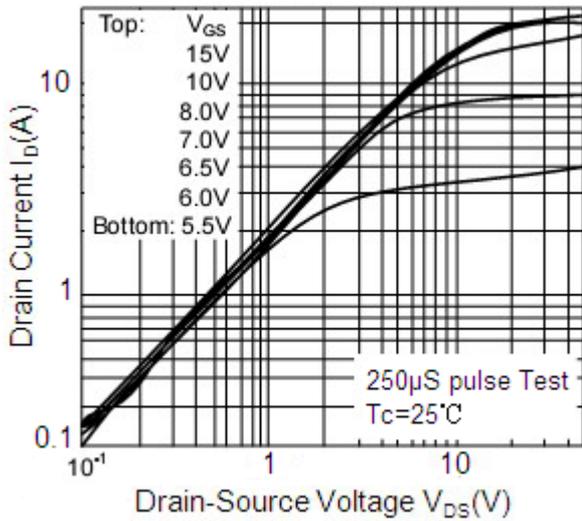
Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250 μ A	600	650	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μ A	2.2	3.4	3.8	V
Gate-Body Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =30V	-	-	100	nA
		V _{DS} =0V, V _{GS} =-30V	-	-	-100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V V _{GS} =0V	-	0.1	20	μ A
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6A	-	0.54	0.7	Ω
Forward Transconductance	g _{FS}	V _{DS} =40V, I _D =6A	-	13	-	S
Drain-Source Diode Forward Continuous Current	I _S	V _{GS} =0V	-	-	12	A
Source-drain (diode forward) voltage	V _{SD}	V _{GS} =0V, I _S =10A		0.9	1.3	V
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	-	1750	-	pF
Output Capacitance	C _{oss}		-	185	-	
Reverse Transfer Capacitance	C _{rss}		-	22	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} = 300 V, R _G = 25 Ω I _D = 12A	-	30	-	ns
Rise Time	t _r		-	100	-	
Turn-Off Delay Time	t _{d(off)}		-	105	-	
Fall-Time	t _f		-	90	-	
Total Gate Charge	Q _g	V _{DS} = 400V, V _{GS} = 10V, I _D = 12A		45	-	nC
Gate-Source Charge	Q _{gs}		-	8.5	-	
Gate-Drain Charge	Q _{gd}		-	21	-	

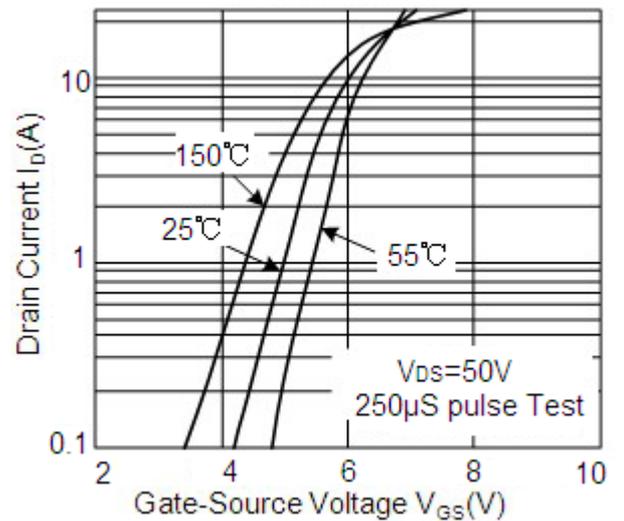
- 1、Repetitive rating, pulse width limited by junction temperature.
- 2、Pulse width <300 μ s , duty cycle <2%.
- 3、I_{SD}≤12A di/dt≤200A/ μ s, V_{DD}≤BV_{DSS}, T_J≤150°C.
- 4、L=10mH, V_{DD}=50V, I_D=12A, R_G=25 Ω , Starting T_J=25°C.

Typical performance characteristics

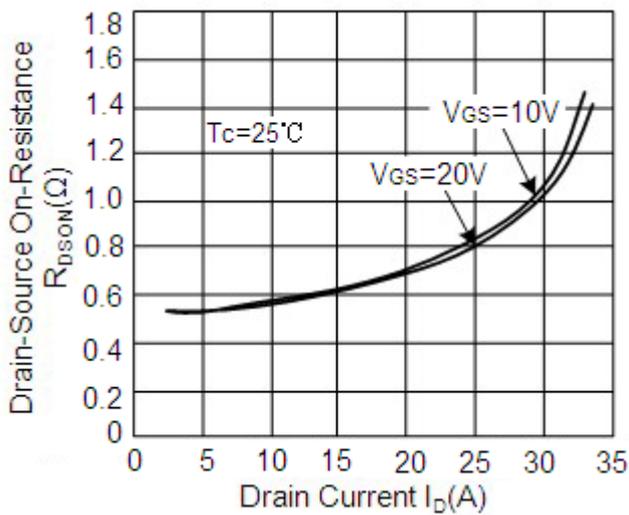
On-Stage characteristics



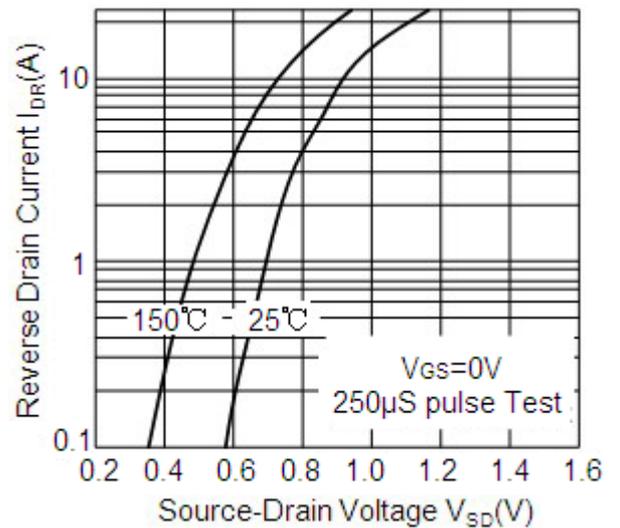
Transfer characteristics



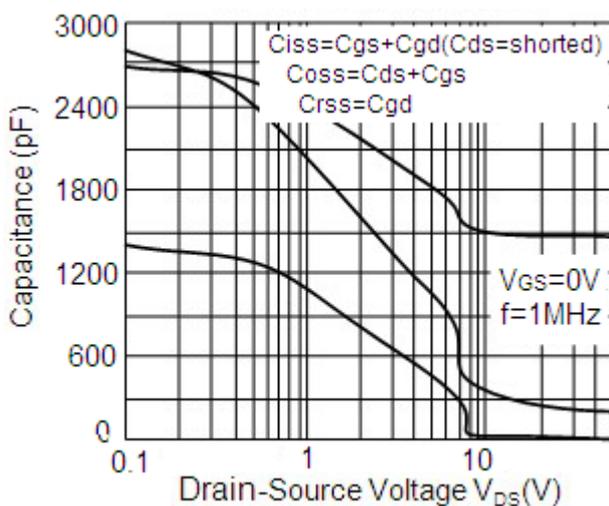
On-Resistance Variation vs. Drain Current and Gate Voltage



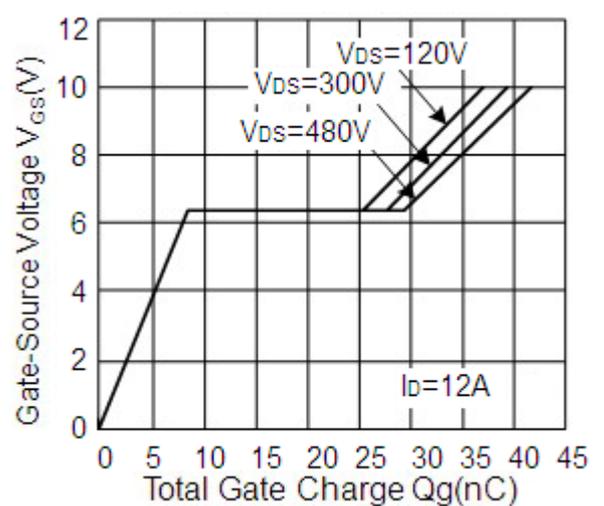
Body Diode forward Voltage vs. Source Current



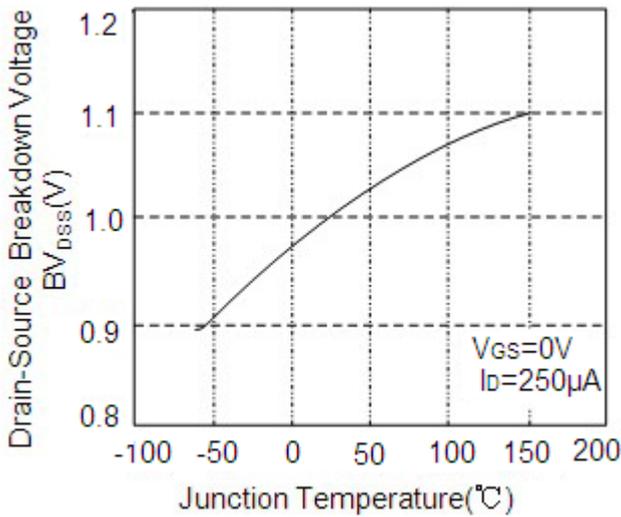
Capacitance characteristics



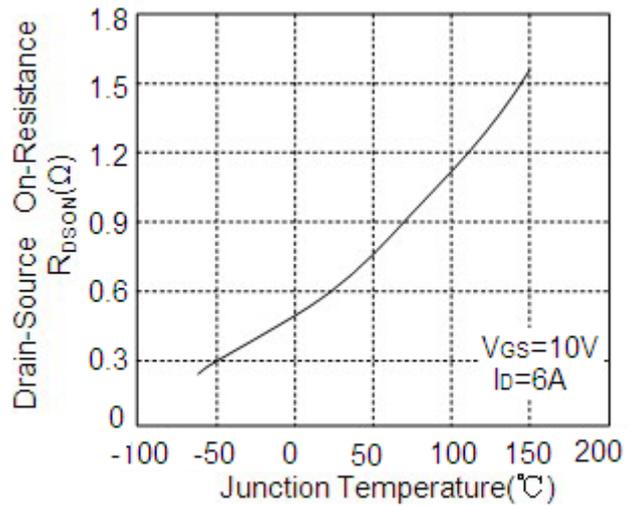
Gate Charge characteristics



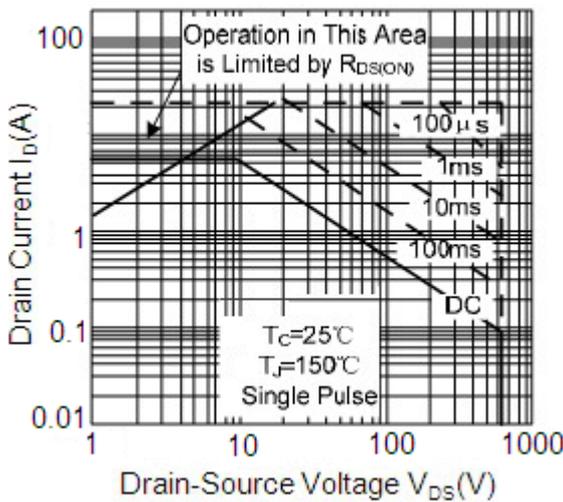
**Breakdown Voltage Variation
Vs. Temperature**



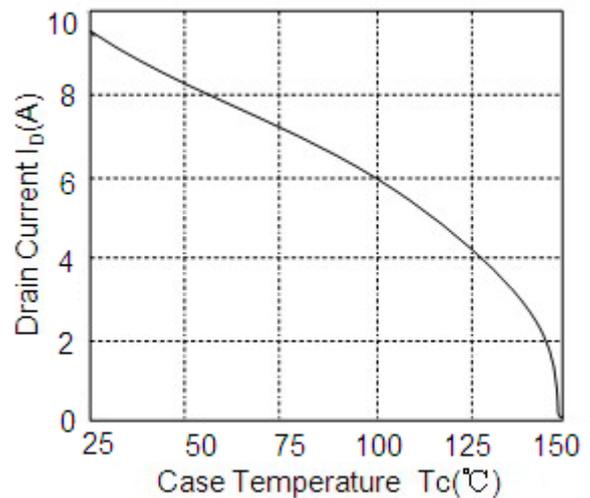
On-Resistance vs. Temperature



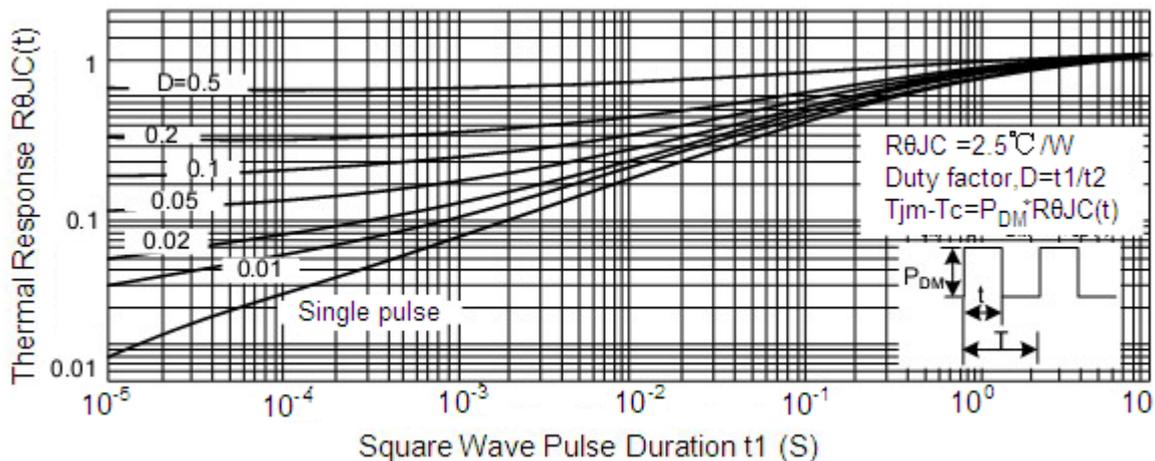
Maximum safe operating area



**Maximum Drain Current vs.
Case Temperature**

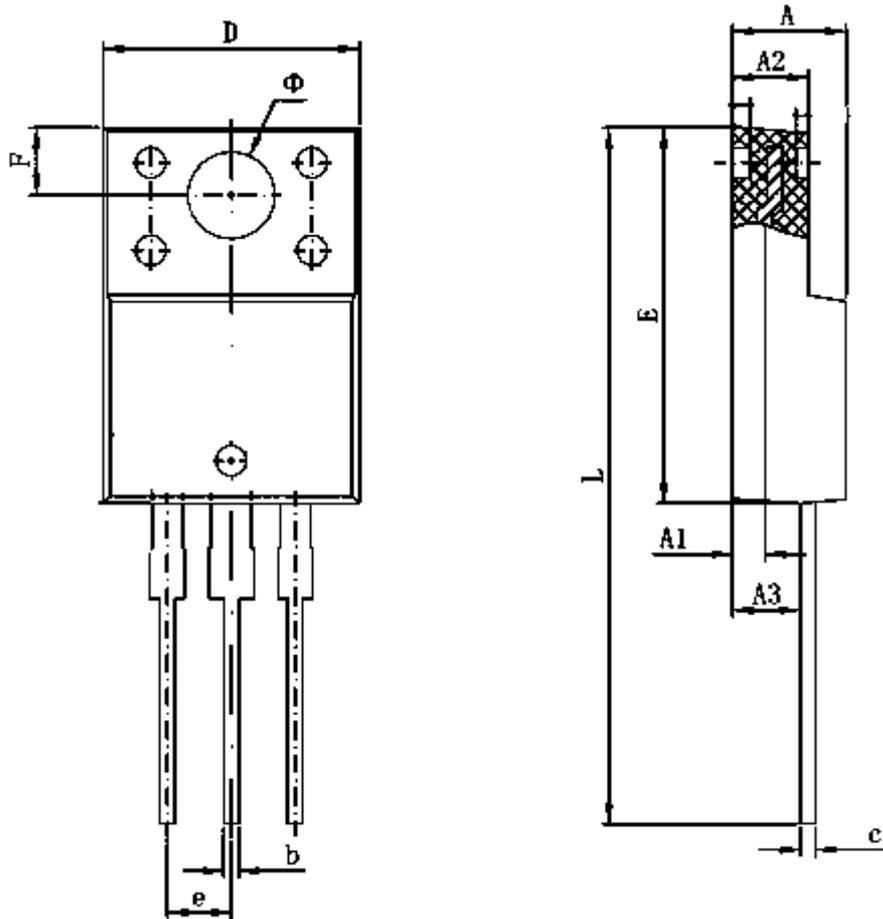


Transient Thermal Response Curve



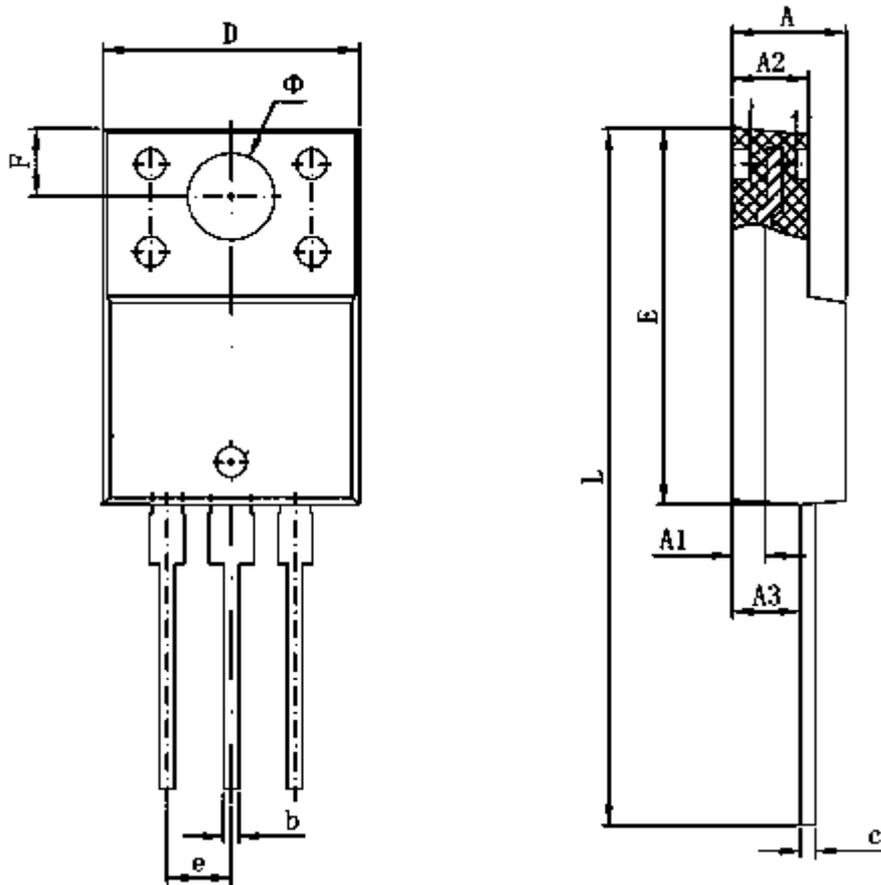
Package Information

- Package Type: TO-220F (A)



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.5	4.9	0.1771	0.1929
A1	0.75	1.05	0.0295	0.0413
A2	2.35	2.75	0.0925	0.1083
A3	2.65	2.85	0.1043	0.1122
b	0.75	0.85	0.0295	0.0334
c	0.45	0.6	0.0177	0.0236
D	10	10.32	0.3937	0.4063
E	15.65	16.05	0.6161	0.6319
e	2.54REF		0.100REF	
F	3.2	3.4	0.1260	0.1338
Φ	3.08	3.28	0.1212	0.1291
L	28.45	29.25	1.1201	1.1516

● Package Type: TO-220F (B)



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.5	4.9	0.1771	0.1929
A1	0.75	1.05	0.0295	0.0413
A2	2.35	2.75	0.0925	0.1083
A3	2.65	2.9	0.1043	0.1142
b	0.75	0.85	0.0295	0.0334
c	0.45	0.6	0.0177	0.0236
D	10	10.32	0.3937	0.4063
E	15.65	16.15	0.6161	0.6358
e	2.54REF		0.100REF	
F	3.2	3.4	0.1260	0.1338
Φ	3.08	3.28	0.1212	0.1291
L	26.2	29.8	1.0315	1.1732

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