

## N-CHANNEL POWER MOSFET MEM10N60

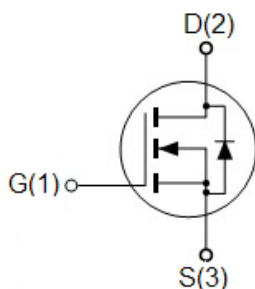
### General Description

The MEM10N60 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 a high 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, 10A
- $R_{DS(ON)}=0.75\Omega@V_{GS}=10V$
- LOW Crss
- Fast Switching
- Avalanche energy specified
- Package : TO220-F

### Pin Configuration



### Maximum Ratings(T<sub>A</sub>=25°C)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V <sub>DSS</sub>	600V	V
Gate-Source Voltage		V <sub>GSS</sub>	±30	V
Drain Current	T <sub>A</sub> =25°C	I <sub>D</sub>	10 ▲	A
	T <sub>A</sub> =100°C		6 ▲	
Pulsed Drain Current <sup>1,2</sup>		I <sub>DM</sub>	40▲	A
Total Power Dissipation	T <sub>A</sub> =25°C	P <sub>d</sub>	50	W
Operating Temperature Range		T <sub>Opr</sub>	-55-150	°C
Storage Temperature Range		T <sub>stg</sub>	-55-150	°C

▲ Drain current limited by maximum junction temperature.

## Thermal Characteristics

Parameter	Symbol	TYP.	MAX.	Unit
Thermal Resistance, Junction-to-Case	R $\theta$ JC	2.5	3	°C/W

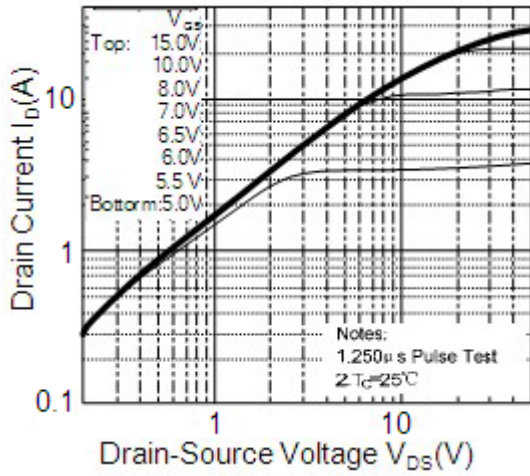
## Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	600	650	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	3.1	4.0	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =30V	-	0.8	100	nA
		V <sub>DS</sub> =0V, V <sub>GS</sub> =-30V	-	-4	-100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =600V V <sub>GS</sub> =0V	-	0.1	20	μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =4.75A	-	0.6	0.75	Ω
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =4.75A	-	8	-	S
Drain-Source Diode Forward Continuous Current	I <sub>S</sub>	V <sub>GS</sub> =0V	-	7	10	A
Source-drain (diode forward) voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =10A		0.8	1.4	V
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V, f = 1 MHz	-	1735	-	pF
Output Capacitance	C <sub>oss</sub>		-	194	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	26	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 300 V, R <sub>G</sub> = 25Ω I <sub>D</sub> = 10A	-	31	-	ns
Rise Time	t <sub>r</sub>		-	8	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	70	-	
Fall-Time	t <sub>f</sub>		-	14	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 480V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A		46	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	12	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	17	-	

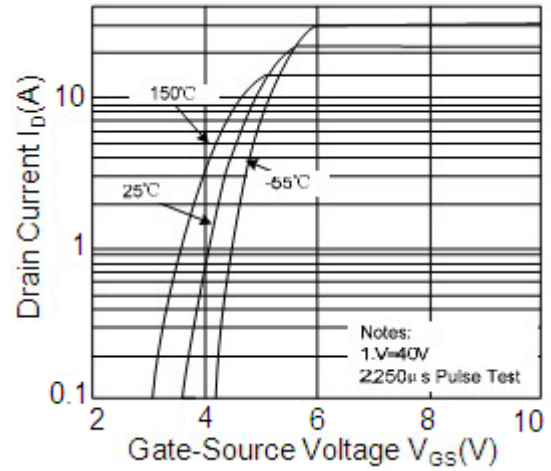
- 1、Repetitive rating, pulse width limited by junction temperature.
- 2、Pulse width <300μs , duty cycle <2%.
- 3、I<sub>SD</sub>≤10A di/dt≤300A/μs, V<sub>DD</sub>≤BV<sub>DSS</sub>, T<sub>J</sub>≤150°C.
- 4、L=14.5mH, V<sub>DD</sub>=50V, I<sub>D</sub>=10A, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.

## Typical performance characteristics

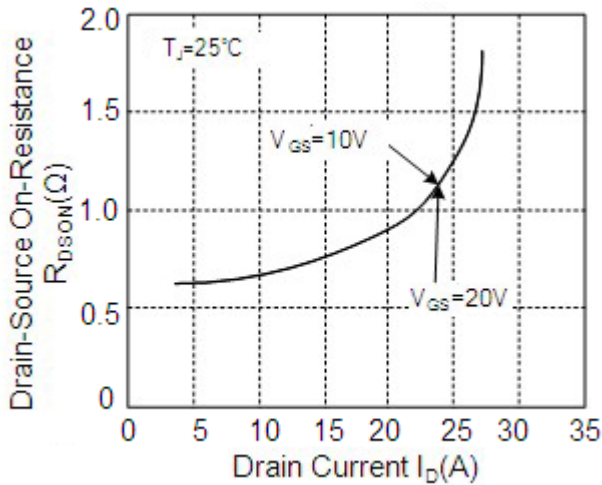
### On-Stage characteristics



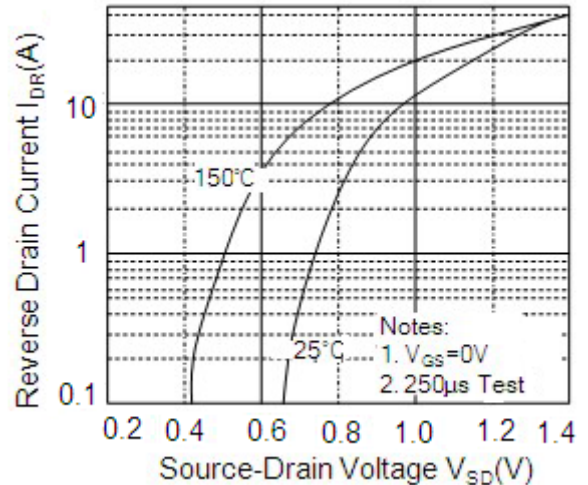
### Transfer characteristics



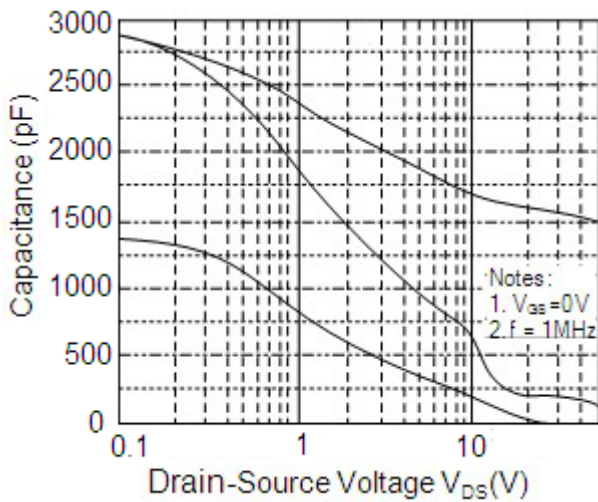
### On-Resistance Variation vs. Drain Current and Gate Voltage



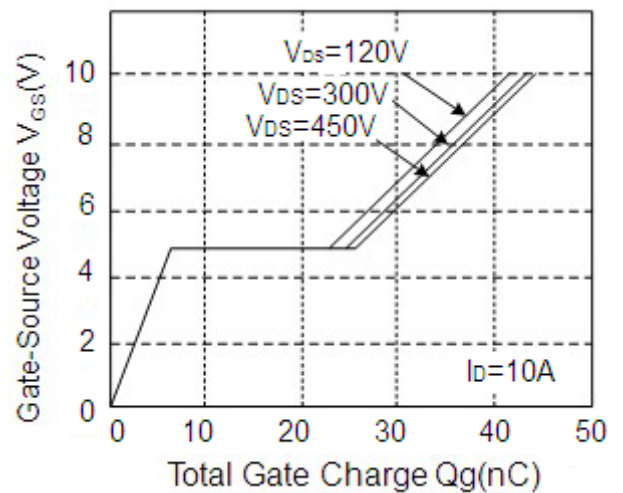
### Body Diode forward Voltage vs. Source Current



### Capacitance characteristics

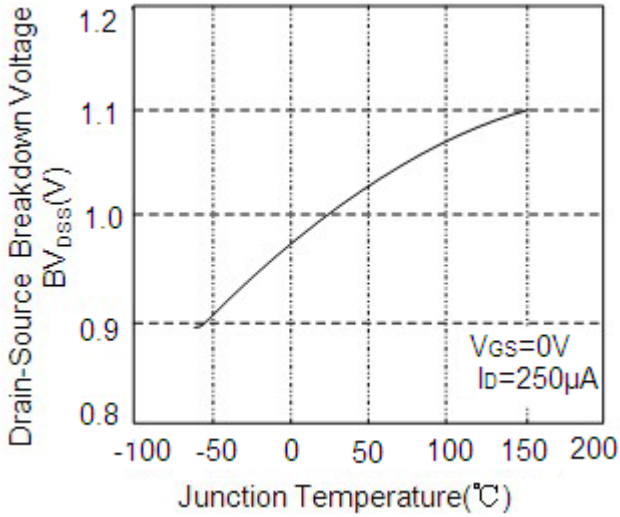


### Gate Charge characteristics

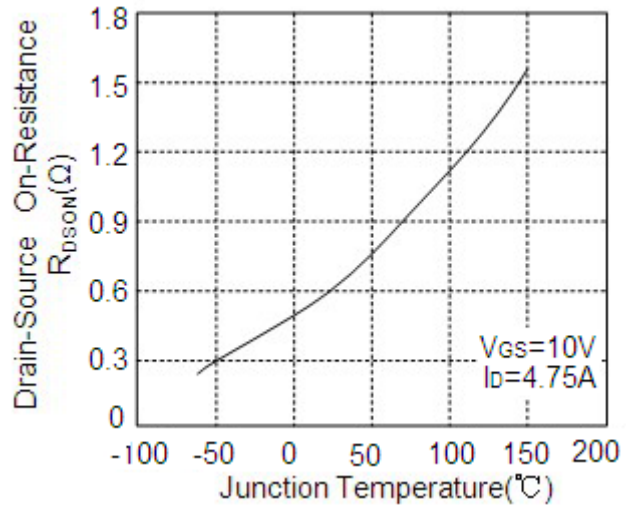


### Breakdown Voltage Variation Vs. Temperature

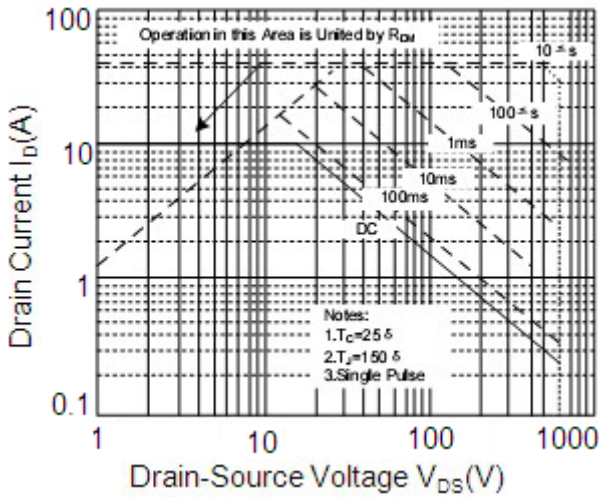
### On-Resistance vs. Temperature



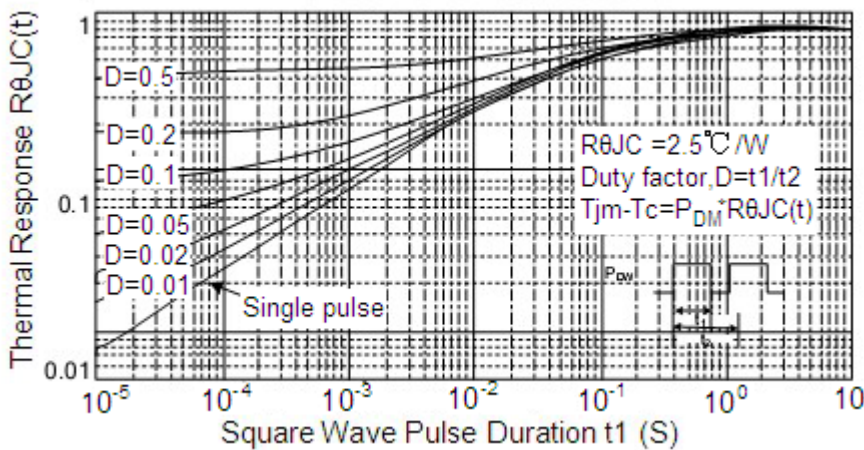
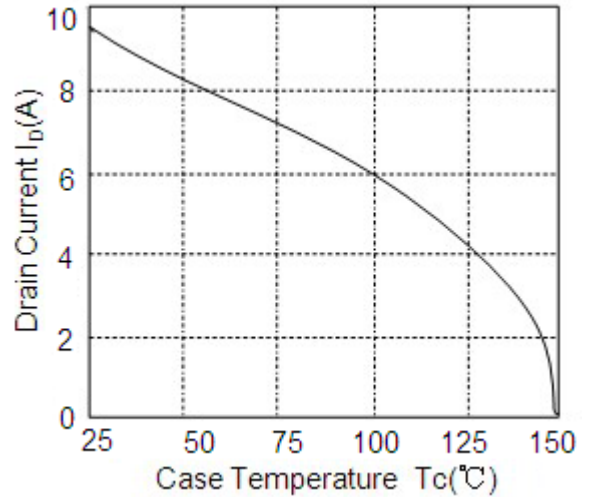
Maximum safe operating area



Maximum Drain Current vs. Case Temperature

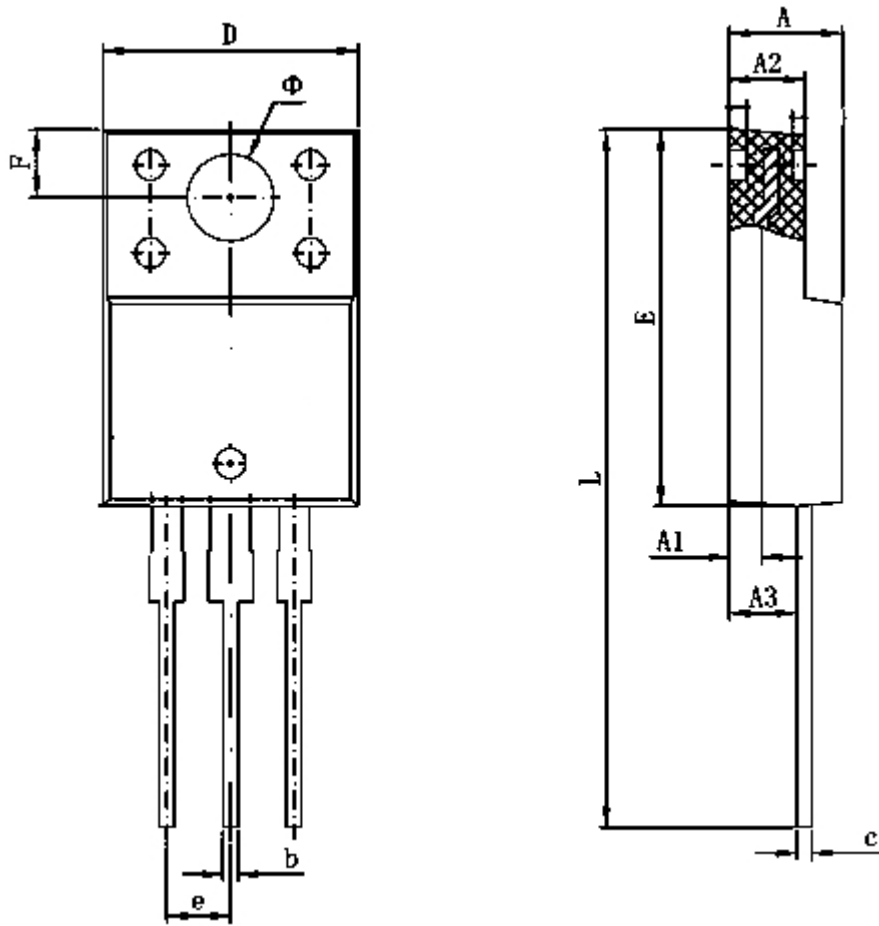


Transient Thermal Response Curve



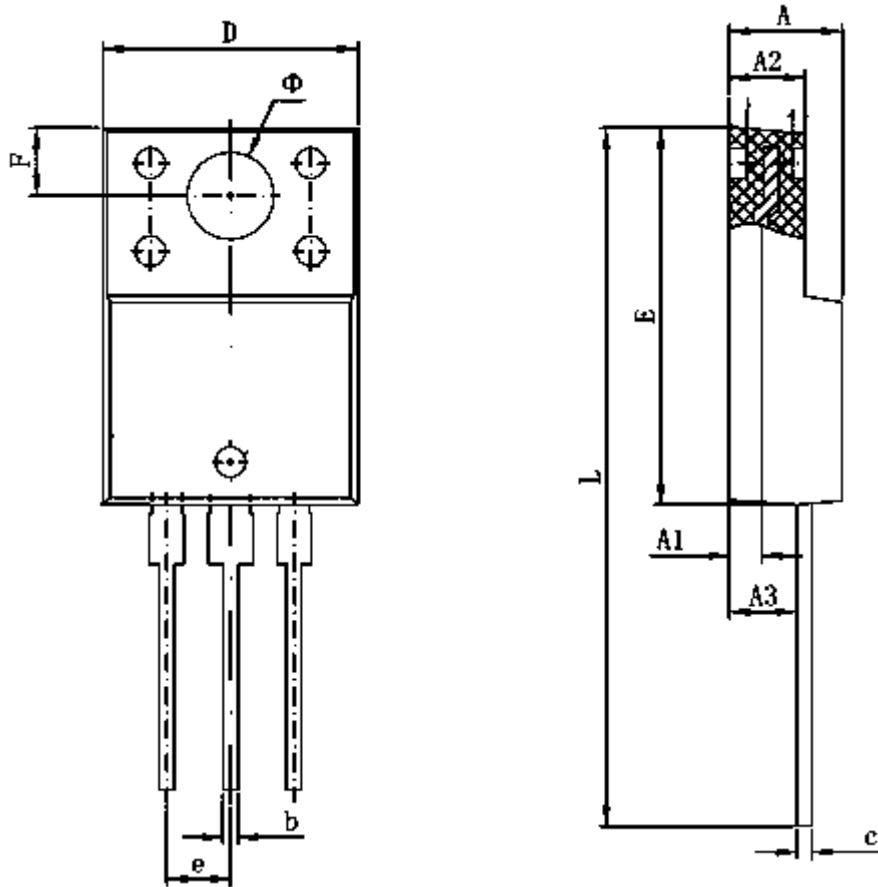
## Package Information

- 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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