

## N-CHANNEL POWER MOSFET MEM12N65

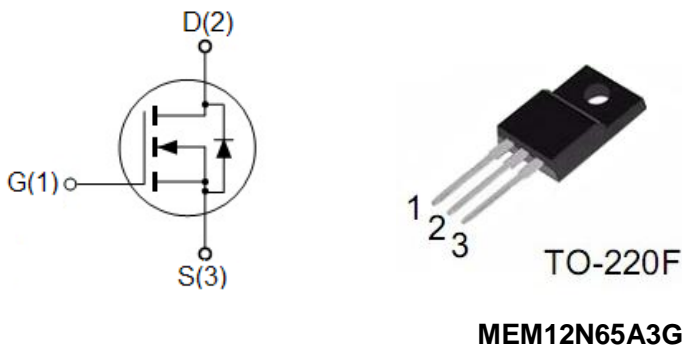
### General Description

- Switching regulator application.
- High voltage and high speed.
- Switching application.

### Features

- 650V, 12A
- $R_{DS(ON)}=0.64\Omega@V_{GS}=10V$
- Low CRSS
- Fast switching
- Package : TO-220F

### Pin Configuration



### Maximum Ratings (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DSS}$	650V	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
Drain Current	$I_D$	$T_A=25^\circ C$	12
		$T_A=100^\circ C$	9
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	48	A
Total Power Dissipation	$P_d$	51	W
Operating Junction Temperature Range	$T_J$	-40~150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C

### Thermal Characteristics

Parameter	Symbol	TYP.	MAX.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.7	3	°C/W

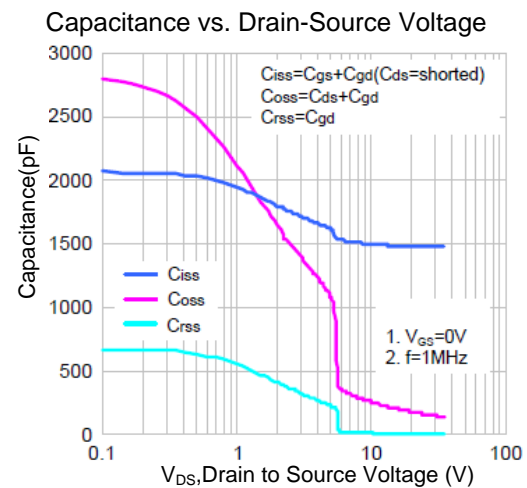
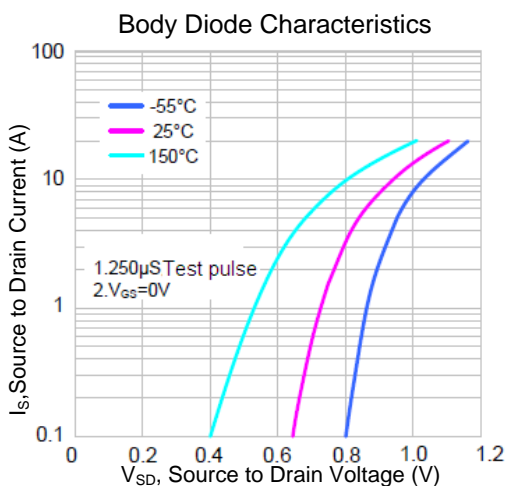
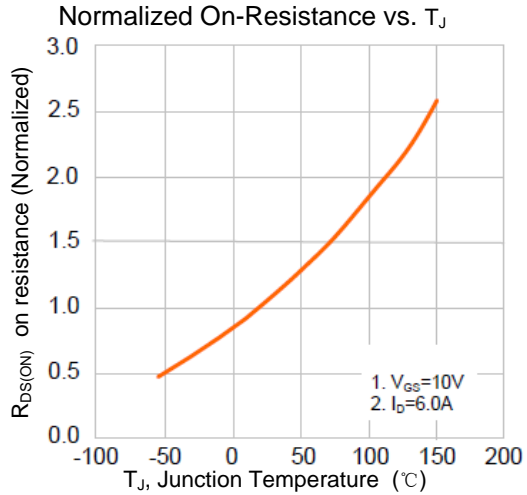
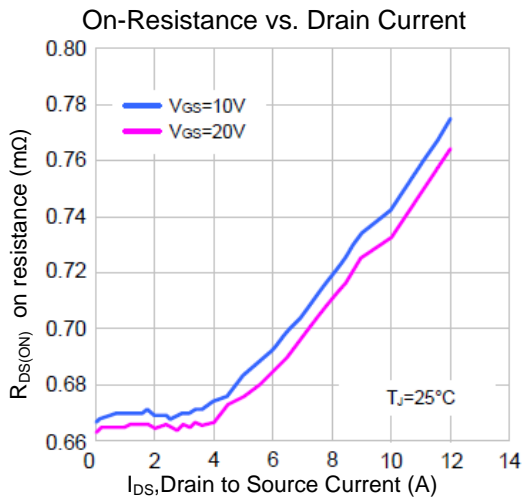
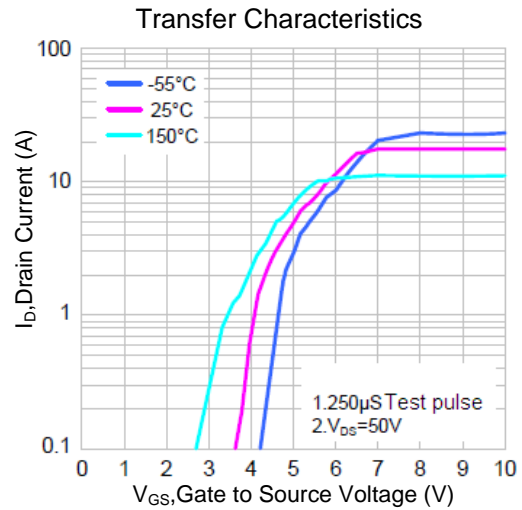
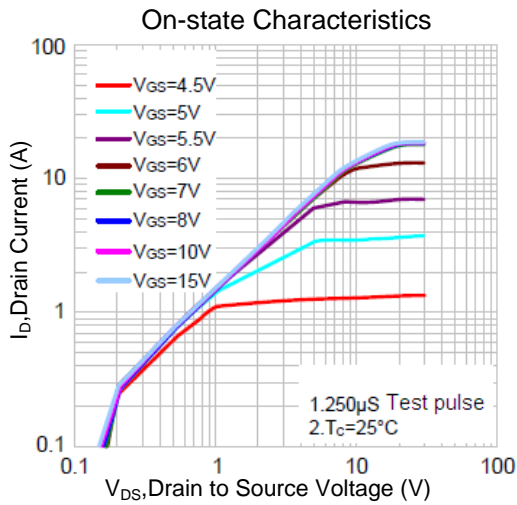
## Electrical Characteristics

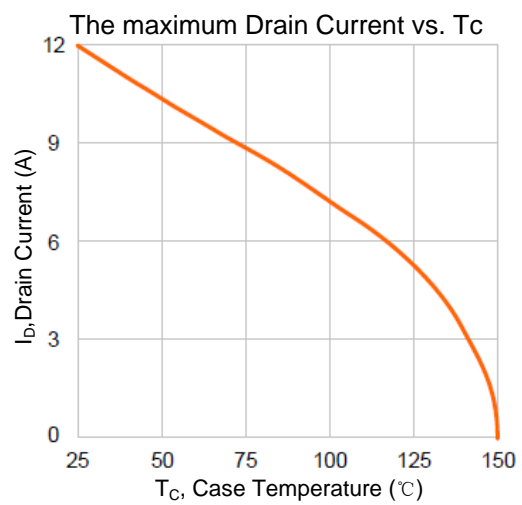
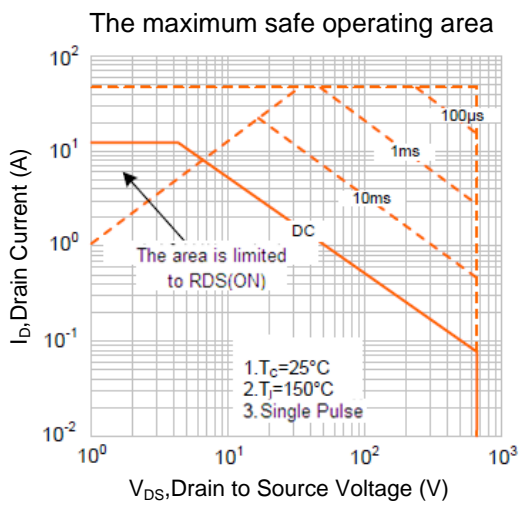
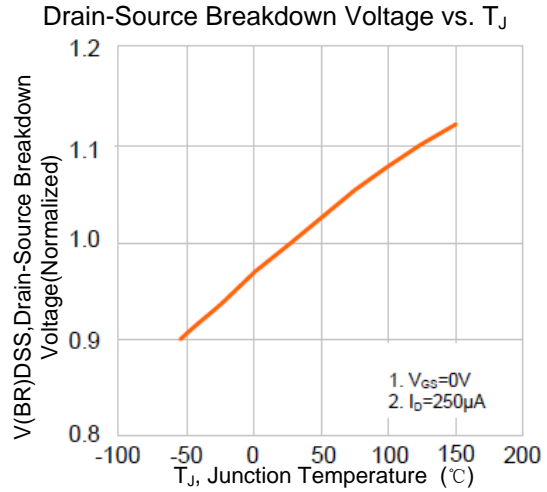
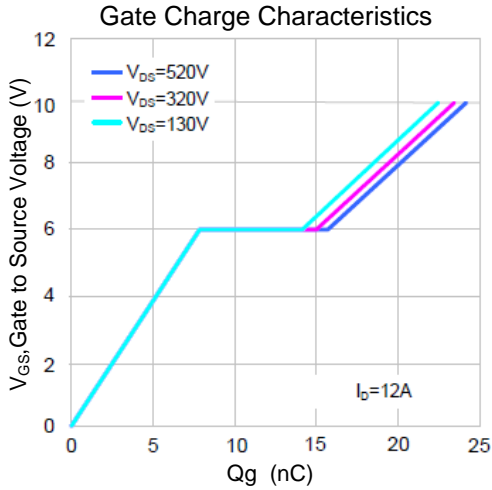
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
		$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V$	-	0.2	1	$\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.5A$	-	0.64	0.8	$\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=15V, I_D=3A$	-	2	10	S
Drain-Source Diode Forward Continuous Current	$I_S$	$V_{GS}=0V$	-	-	12	A
Source-drain (diode forward) voltage	$V_{SD}$	$V_{GS}=0V, I_S=12A$	-	-	1.4	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1MHz(Notes1,2)$	-	1476	-	pF
Output Capacitance	$C_{oss}$		-	152	-	
Reverse Transfer Capacitance	$C_{rss}$		-	4.5	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=325V,$ $R_G=25\Omega$ $V_{GS}=10V,$ $I_D=12A(Notes1,2)$	-	37	-	ns
Rise Time	$t_r$		-	61	-	
Turn-Off Delay Time	$t_{d(off)}$		-	80	-	
Fall-Time	$t_f$		-	46	-	
Total Gate Charge	$Q_g$	$V_{DS}=520V,$ $V_{GS}=10V,$ $I_D=12A(Notes1,2)$	-	24.15	-	nC
Gate-Source Charge	$Q_{gs}$		-	7.86	-	
Gate-Drain Charge	$Q_{gd}$		-	7.47	-	

**Note:** 1、Not influenced by junction temperature.

2、Pulse width <300 $\mu s$ , duty cycle <2%.

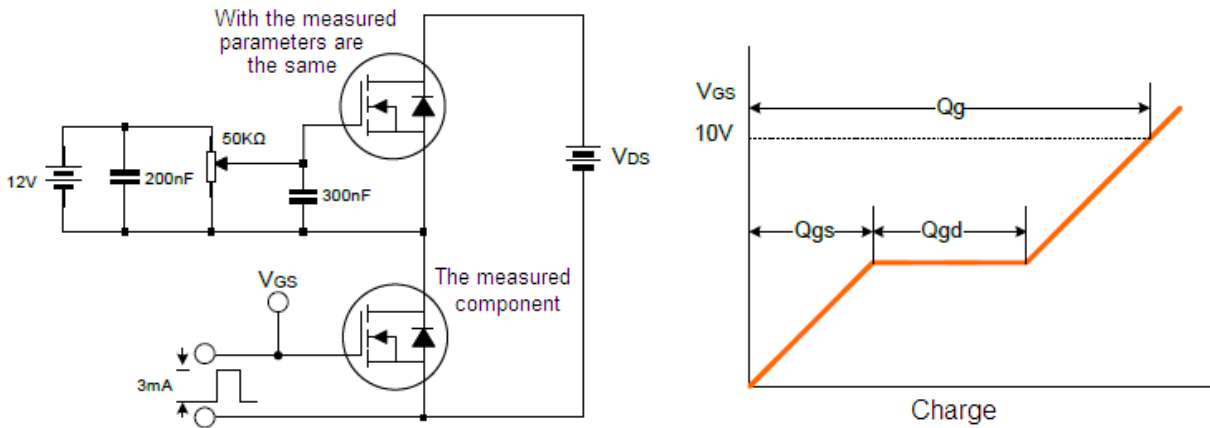
## Typical performance characteristics



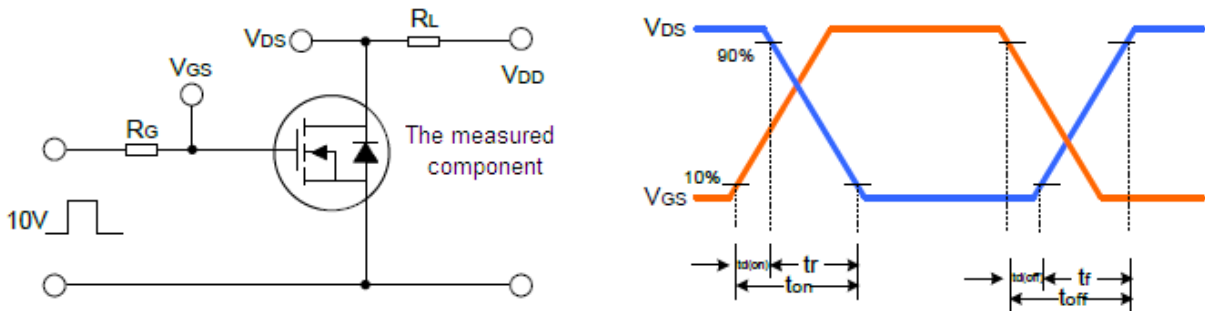


Typical Circuit

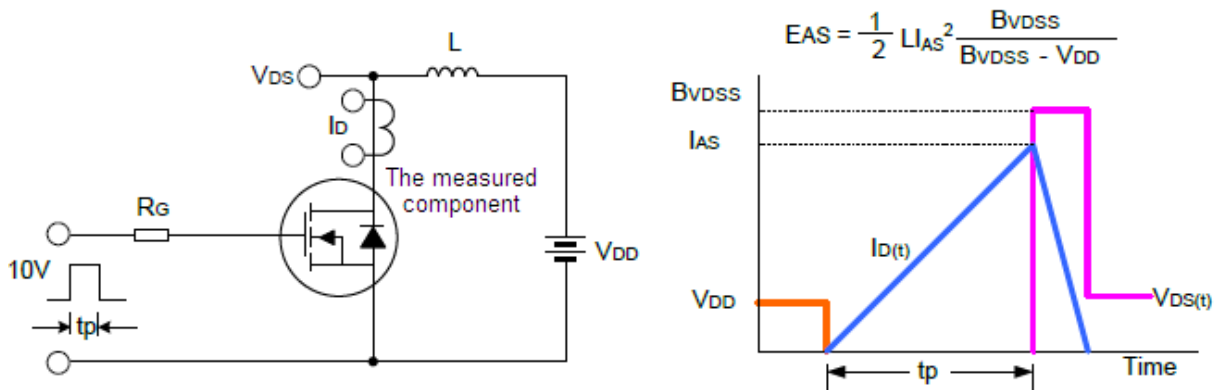
Gate Charge Testing circuit with Waveform



Switching test circuit with Waveform

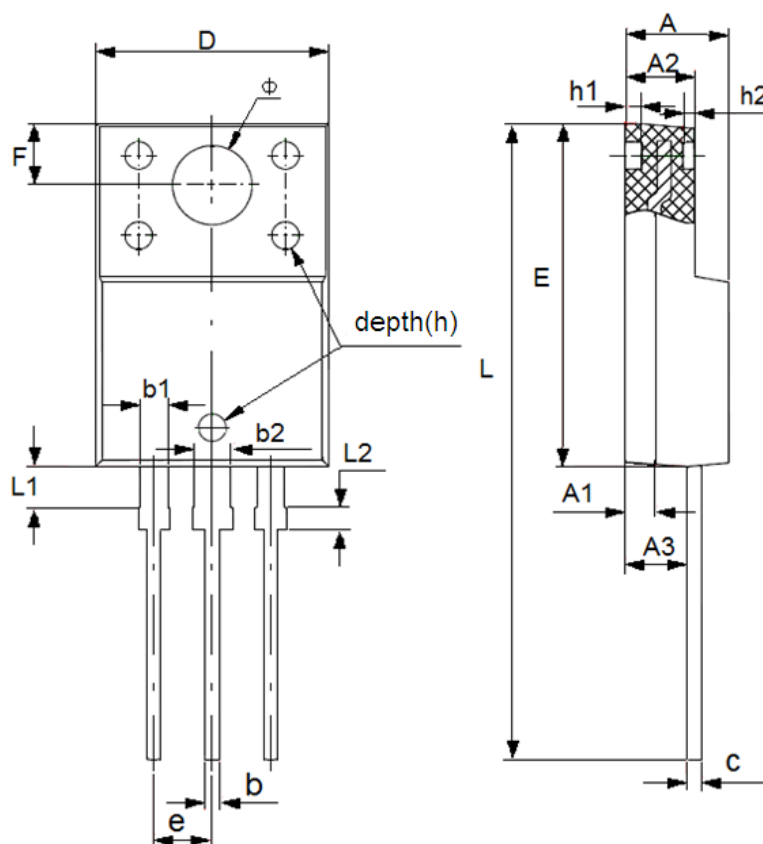


Eas Test circuit and Waveform



## Package Information

- Package Type: TO-220F



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.3	4.83	0.1693	0.1902
A1	1.3(TYP)		0.0512(TYP)	
A2	2.45	3.2	0.0965	0.126
A3	2.5	2.9	0.0984	0.1142
b	0.5	0.75	0.0197	0.0295
b1	1.1	1.35	0.0433	0.0531
b2	1.5	1.75	0.0591	0.0689
c	0.5(TYP)		0.0197(TYP)	
D	9.96	10.4	0.3921	0.4094
E	14.8	16.1	0.5827	0.6339
e	2.54(TYP)		0.1(TYP)	
F	2.7(TYP)		0.1063(TYP)	
$\Phi$	3.45(TYP)		0.1358(TYP)	
h	0.15(TYP)		0.0059(TYP)	
h1	0.8(TYP)		0.0315(TYP)	
h2	0.5(TYP)		0.0197(TYP)	
L	28	28.8	1.1024	1.1339
L1	1.7	1.9	0.067	0.0748
L2	0.9	1.1	0.0354	0.0433

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