



Micro Commercial Components



Micro Commercial Components  
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# MCG30N03

## N-Channel Power MOSFET

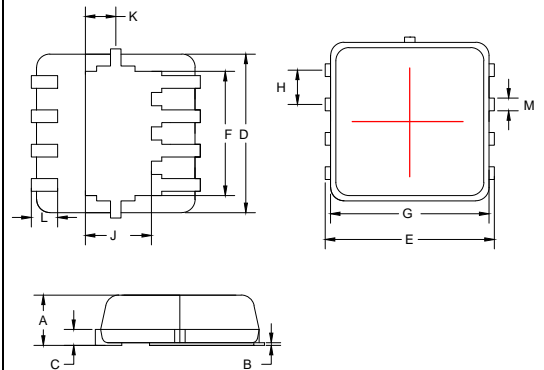
### Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Halogen free available upon request by adding suffix "-HF"
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

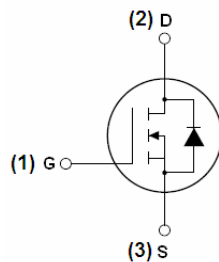
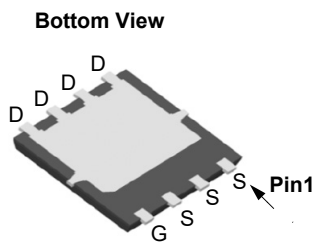
### Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	30	V
$I_D$	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	30
		$T_C = 100^\circ\text{C}$	21
$I_{DM}$	Pulsed Drain Current (Note 1)	60	A
$V_{GS}$	Gate-source Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	25	W
$R_{thJC}$	Thermal Resistance, Junction-to-Case (Note 2)	5	$^\circ\text{C}/\text{W}$
$E_{AS}$	Single pulse avalanche energy (Note 5)	70	mj
$T_J$	Operating Junction Temperature	-55 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	-55 to +150	$^\circ\text{C}$

### DFN3030



### EQUIVALENT CIRCUIT



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.028	0.035	0.70	0.90	
B	0.000	0.002	0.00	0.05	
C	0.004	0.010	0.10	0.25	
D	0.118 BSC		3.00 BSC		
E	0.126 BSC		3.20 BSC		
F	0.093 BSC		2.35 BSC		
G	0.118 BSC		3.00 BSC		
H	0.026 BSC		0.65 BSC		
J	0.069 BSC		1.75 BSC		
K	0.023 BSC		0.575 BSC		
L	0.012	0.020	0.30	0.50	
M	0.009	0.014	0.24	0.35	

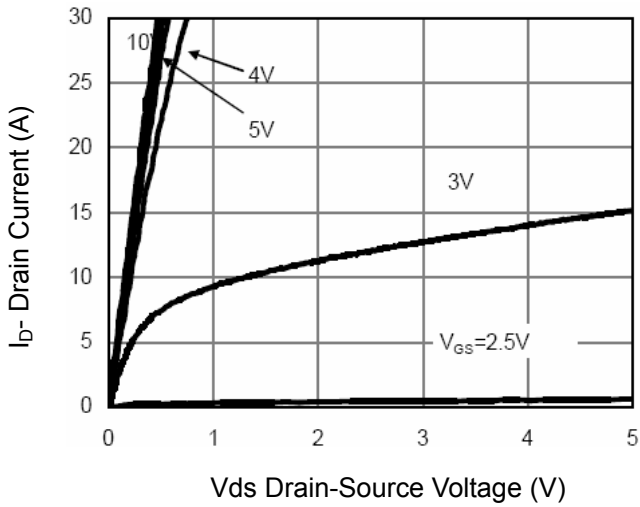
**ELECTRICAL CHARACTERISTICS**( $T_a=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	33	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	6.3	9	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	-	9.2	13	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=20A$	15	-	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$	-	1490	-	PF
Output Capacitance	$C_{oss}$		-	220	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	135	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V, I_D=10A$ $V_{GS}=10V, R_{GEN}=1.8\Omega$	-	10	-	nS
Turn-on Rise Time	$t_r$		-	8	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	$t_f$		-	5	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=15V, I_D=9A,$ $V_{GS}=10V$	-	15	-	nC
Gate-Source Charge	$Q_{gs}$		-	3	-	nC
Gate-Drain Charge	$Q_{gd}$		-	4.5	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=10A$	-	0.85	1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	25	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^{\circ}\text{C}, I_F = 10A$ $di/dt = 100A/\mu s$ (Note3)	-	22	35	nS
Reverse Recovery Charge	$Q_{rr}$		-	12	20	nC
Forward Turn-On Time	$t_{on}$	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

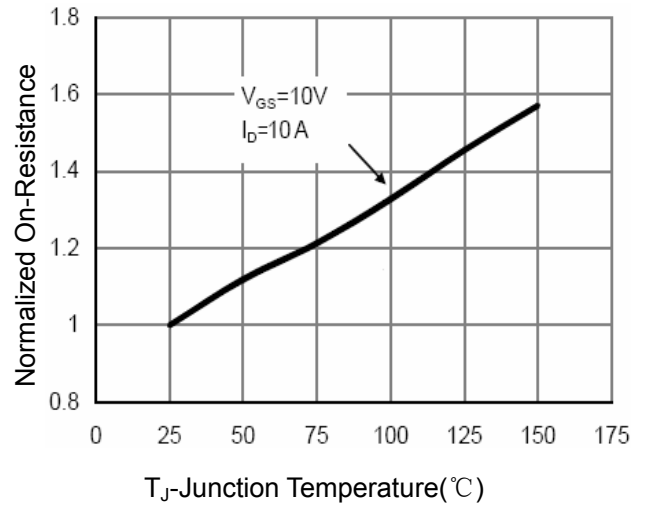
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5. EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=15V, V_G=10V, L=0.1mH, R_g=25\Omega$

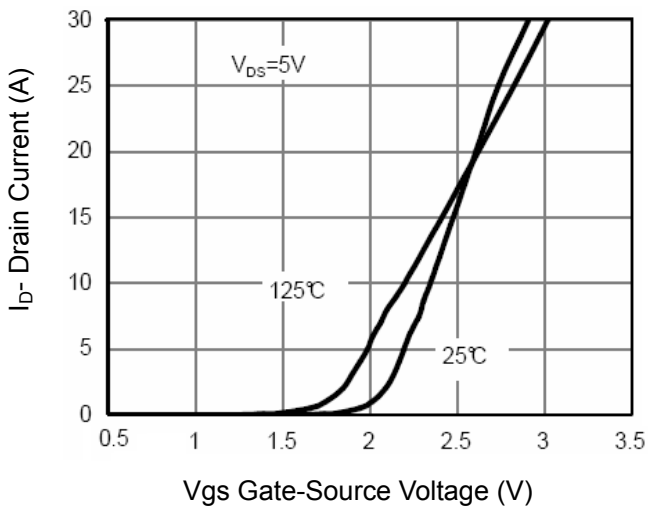
**Typical Electrical and Thermal Characteristics**



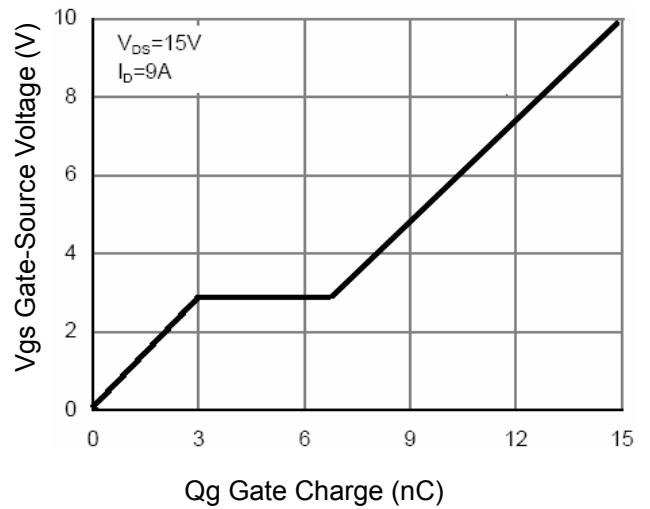
**Figure 1 Output Characteristics**



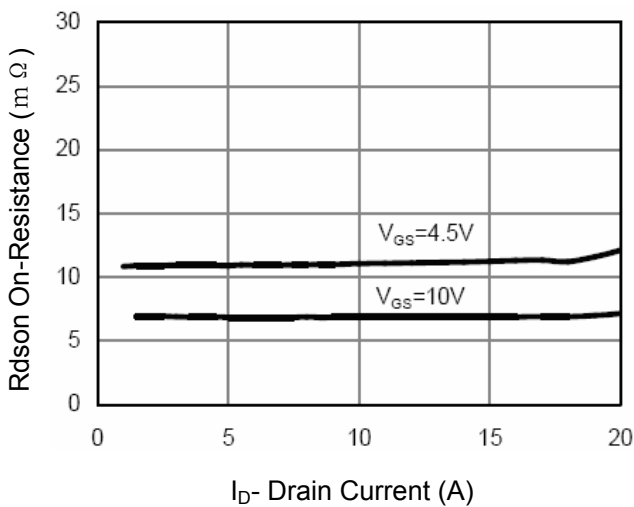
**Figure 4 Rds(on)-Junction Temperature**



**Figure 2 Transfer Characteristics**

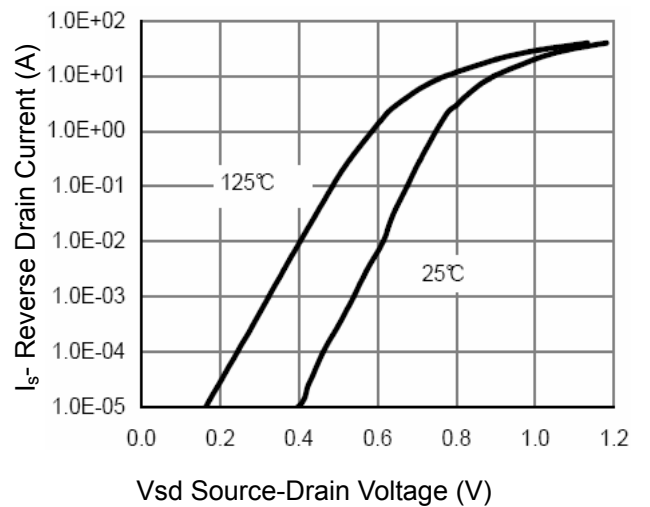


**Figure 5 Gate Charge**



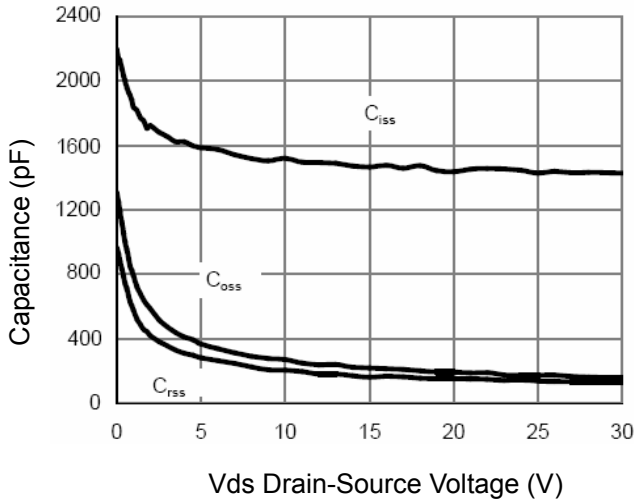
**Figure 3 Rds(on)- Drain Current**

**Figure 1 Output Characteristics**

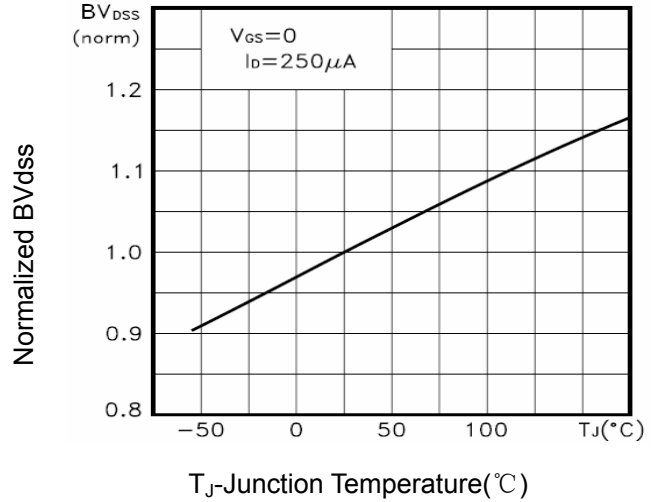


**Figure 6 Source- Drain Diode Forward**

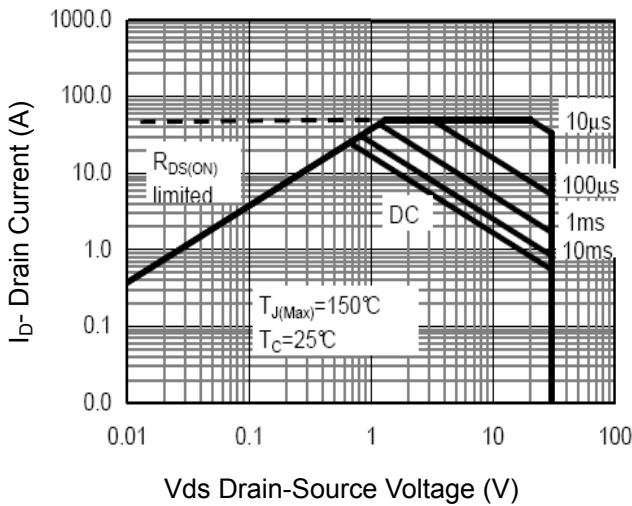
**Typical Electrical and Thermal Characteristics**



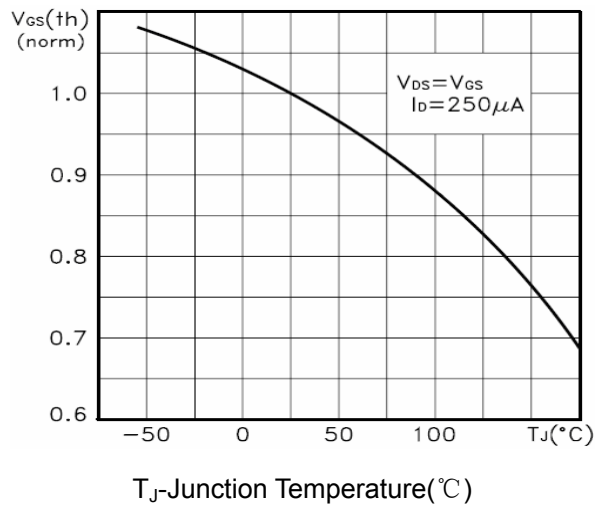
**Figure 7 Capacitance vs Vds**



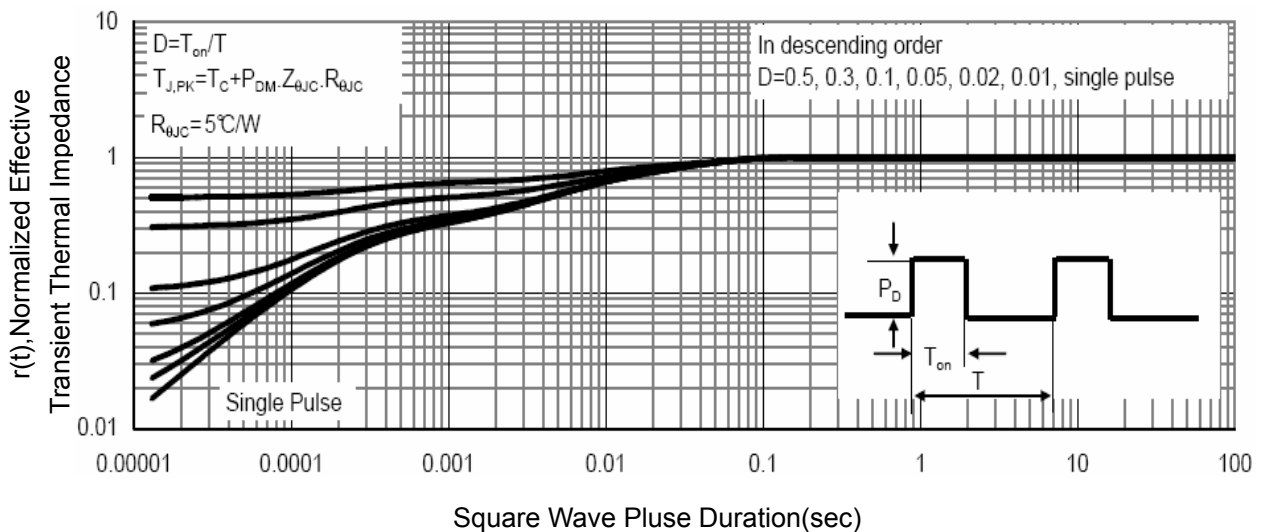
**Figure 9 BV<sub>DSS</sub> vs Junction Temperature**



**Figure 8 Safe Operation Area**



**Figure 10 V<sub>GS(th)</sub> vs Junction Temperature**



**Figure 11 Normalized Maximum Transient Thermal Impedance**



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## Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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