Micro Commercial Components

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MCAC50N03Y

N-Channel Power MOSFET

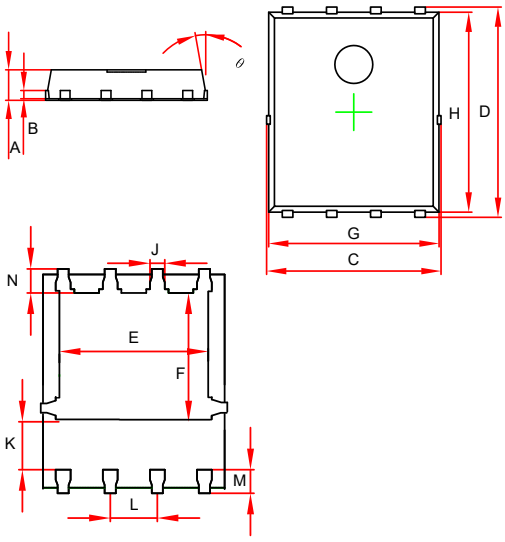
Features

- Trench Power MV MOSFET technology
- Low $R_{DS(ON)}$
- 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

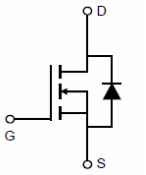
Symbol	Parameter		Rating	Unit
V_{DS}	Drain-source Voltage		30	V
I_D	Drain Current-Continuous (Note 7)	T_C = 25°C T_C = 100°C	50 35	A
I_{DM}	Pulsed Drain Current (Note 3)		200	A
V_{GS}	Gate-source Voltage		±20	V
P_{DSM}	Maximum Power Dissipation (Note 1)	T_C = 25°C T_C = 100°C	38 19	W
E_{AS}	Single pulse avalanche energy (Note 3)		300	mj
T_J	Operating Junction Temperature		-55 to +175	℃
T_{STG}	Storage Temperature		-55 to +175	℃

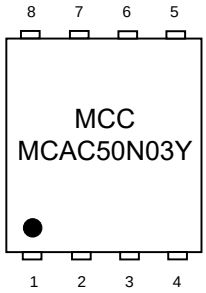
DFN5060



Dimensions					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	.039	0.900	1.000	
B	0.010REF.		0.254REF.		
C	0.193	0.200	4.900	5.100	
D	0.232	0.240	5.900	6.100	
E	0.148	0.163	3.750	4.150	
F	0.130	0.142	3.300	3.600	
G	0.189	0.197	4.800	5.000	
H	0.222	0.230	5.650	5.850	
K	0.047	0.059	1.200	1.500	
J	0.014	0.018	0.350	0.450	
L	0.048	0.052	1.220	1.320	
M	0.020	0.028	0.510	0.710	
N	0.020	0.028	0.510	0.710	

Internal Structure and Marking Code





ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±20V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1	1.3	2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=25A		4.3	5.6	mΩ
		V_{GS}=4.5V, I_D=25A		5.4	7.0	
g_{FS}	Diode Forward Voltage	V_{DS}=5V, I_D=25A	20			S
V_{SD}	Diode Forward Voltage	I_S=50A,V_{GS}=0V		0.85	0.99	V
I_S	Maximum Body-Diode Continuous Current (note 7)				50	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz		2989		pF
C_{oss}	Output Capacitance			335		pF
C_{rss}	Reverse Transfer Capacitance			290		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.9		Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=25V, I_D=14A		26		nC
Q_{gs}	Gate Source Charge			3.5		nC
Q_{gd}	Gate Drain Charge			14		nC
$t_{D(on)}$	Turn-on Delay Time	V_{GS}=4.5V, V_{DS}=15V, R_L=2.5Ω, R_{GEN}=3Ω		21		ns
t_r	Turn-on Rise Time			32		ns
$t_{D(off)}$	Turn-off Delay Time			59		ns
t_f	Turn-off Fall Time			34		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=20A,di/dt=100A/us		14		ns
Q_{rr}	Body Diode Reverse Recovery charge	I_F=20A,di/dt=100A/us		2.8		nC

Note:

1. The value of R θ JA is measured with the device mounted on 1in2 FR - 4 board with 2oz. Copper, in a still air environment with TA =25° C. The Power dissipation PDSM is based on R θ JA t≤ 10s and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design.
2. The power dissipation PD is based on TJ(MAX)=175° C, using junction - to - case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature TJ(MAX)=175° C.
4. The R θ JA is the sum of the thermal impedance from junction to case R θ JC and case to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300 s pulses, duty cycle 0.5% max.
6. These curves are based on the junction - to - case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of TJ(MAX)=175° C. The SOA curve provides a single pulse rating.
7. The maximum current rating is package limited.

Typical Electrical and Thermal Characteristics

Figure 1. Typ. Output Characteristics

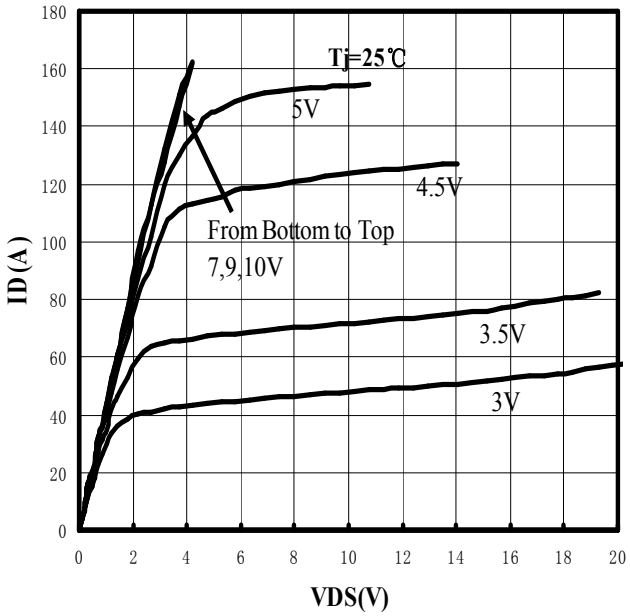


Figure 2. Typ. Output Characteristics

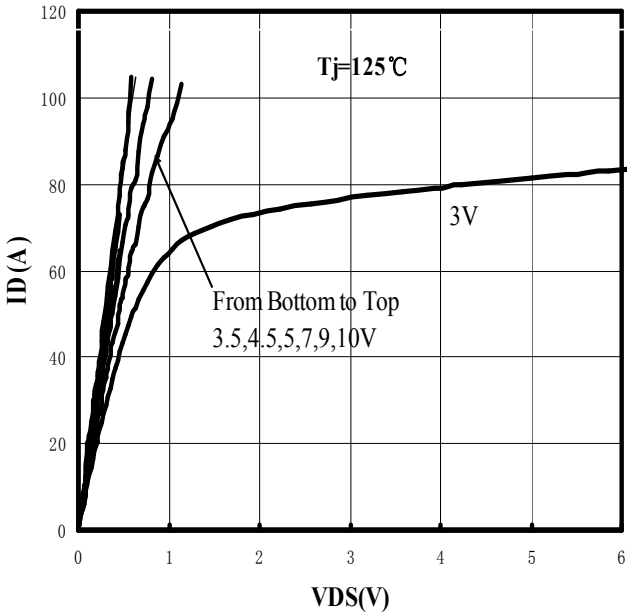


Figure 3. Transfer Characteristics

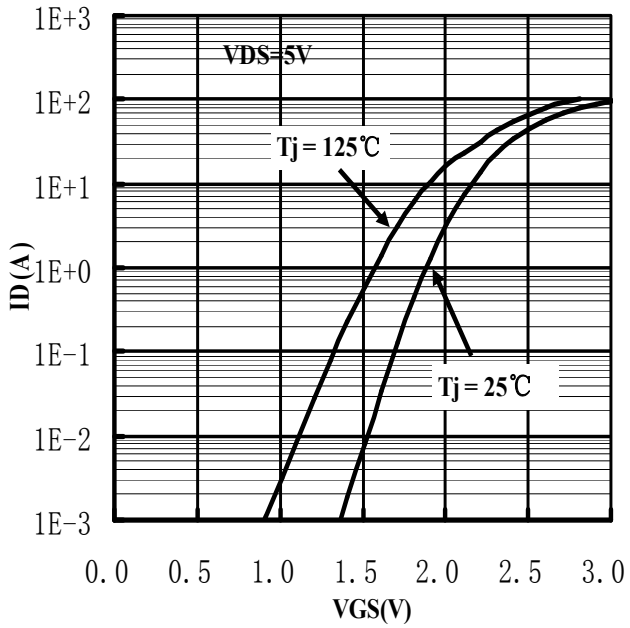
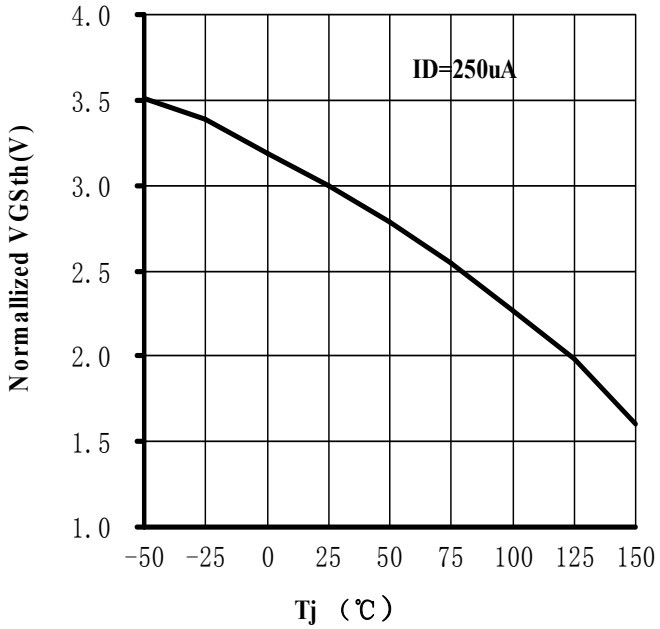


Figure 4. Gate Threshold Voltage Characteristics



Typical Electrical and Thermal Characteristics

Figure 5. Rdson vs. Drain Current Characteristics

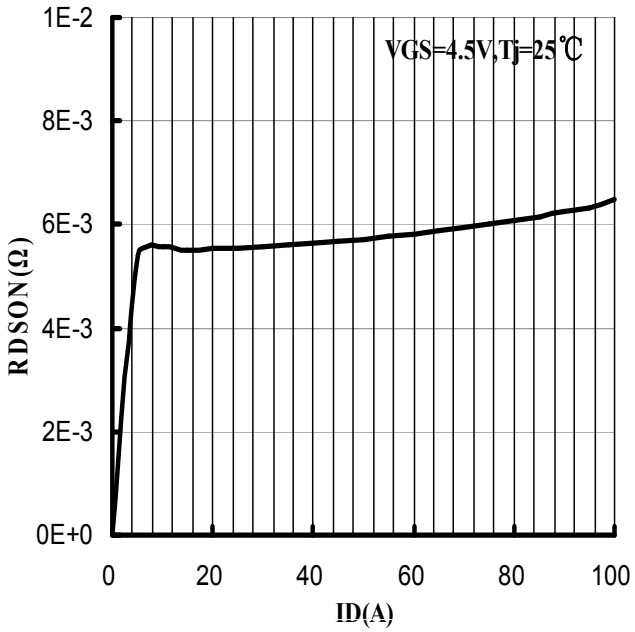


Figure 6. Rdson vs. Junction Tem Characteristics

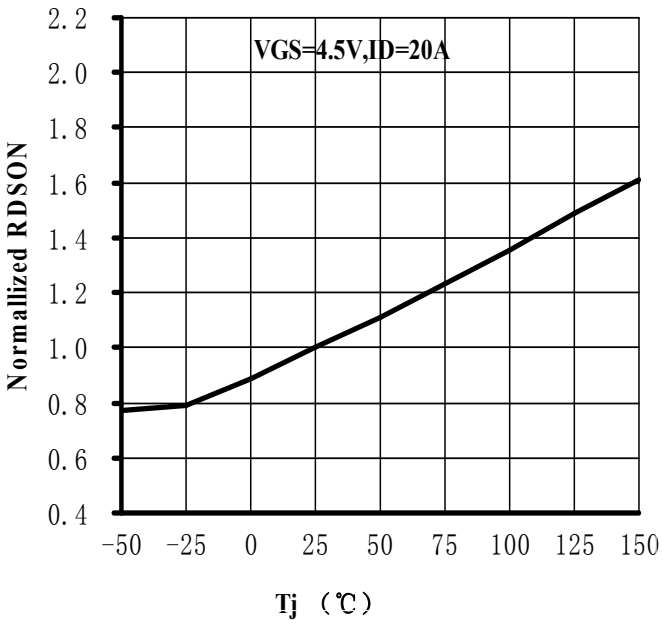


Figure 7. Rdson vs. VGS Characteristics

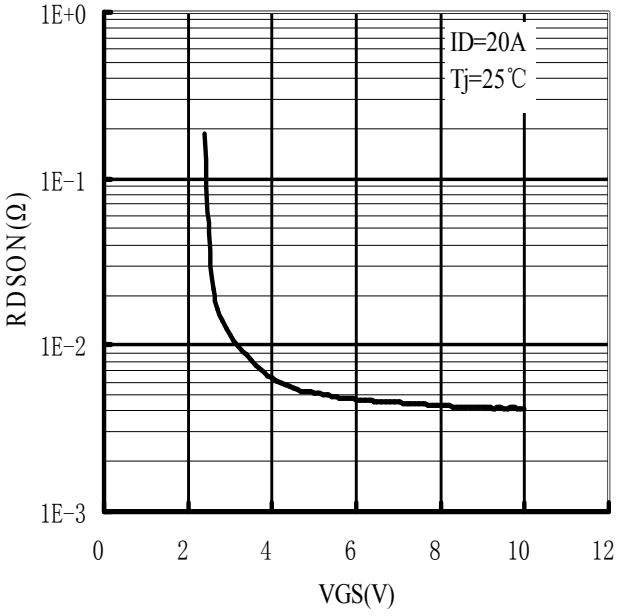
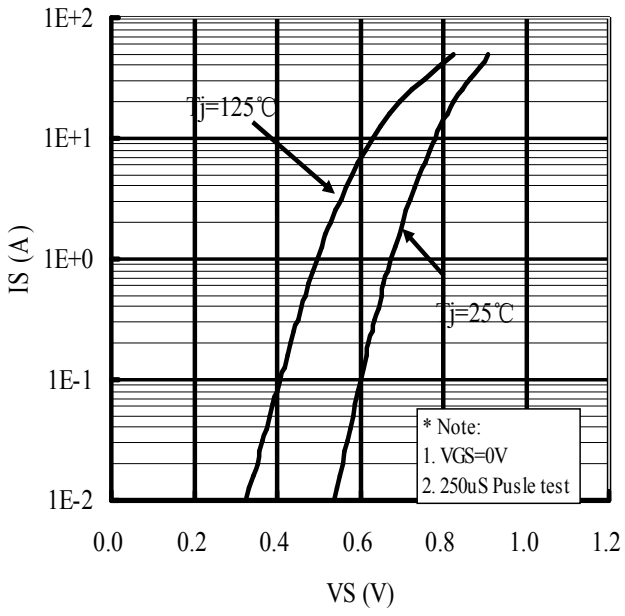


Figure 8. IS vs. VSD Characteristics



Typical Electrical and Thermal Characteristics

Figure 9. Gate Charge Characteristics

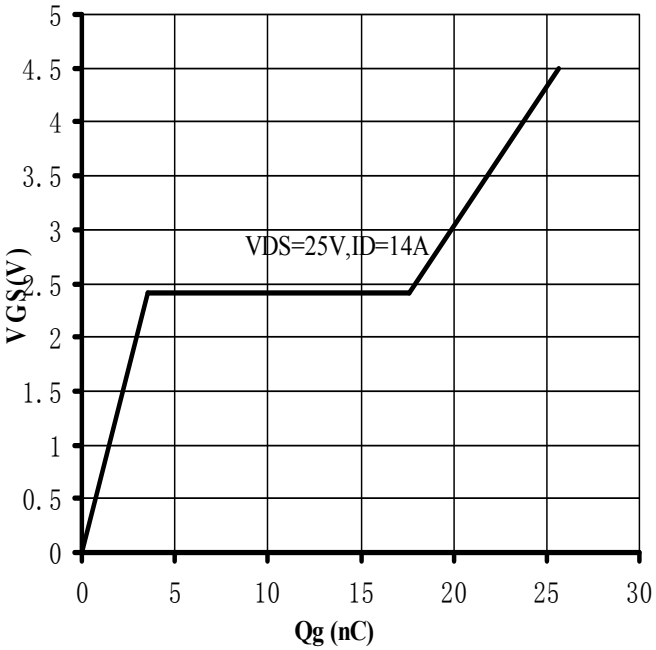


Figure 10. Capacitance Characteristics

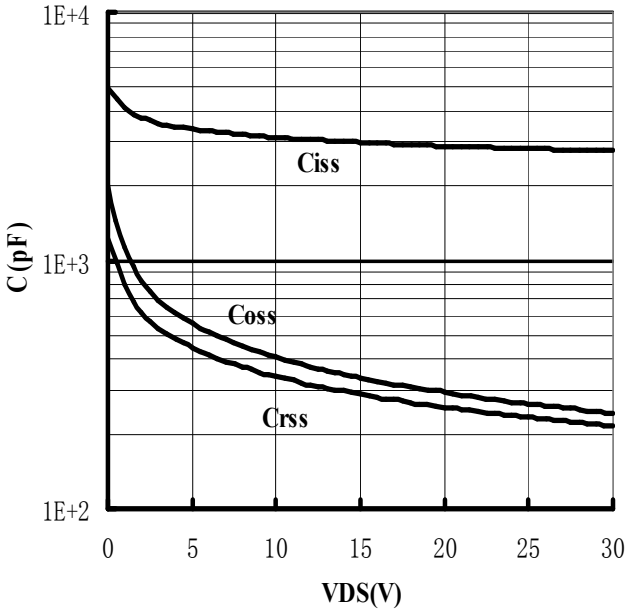
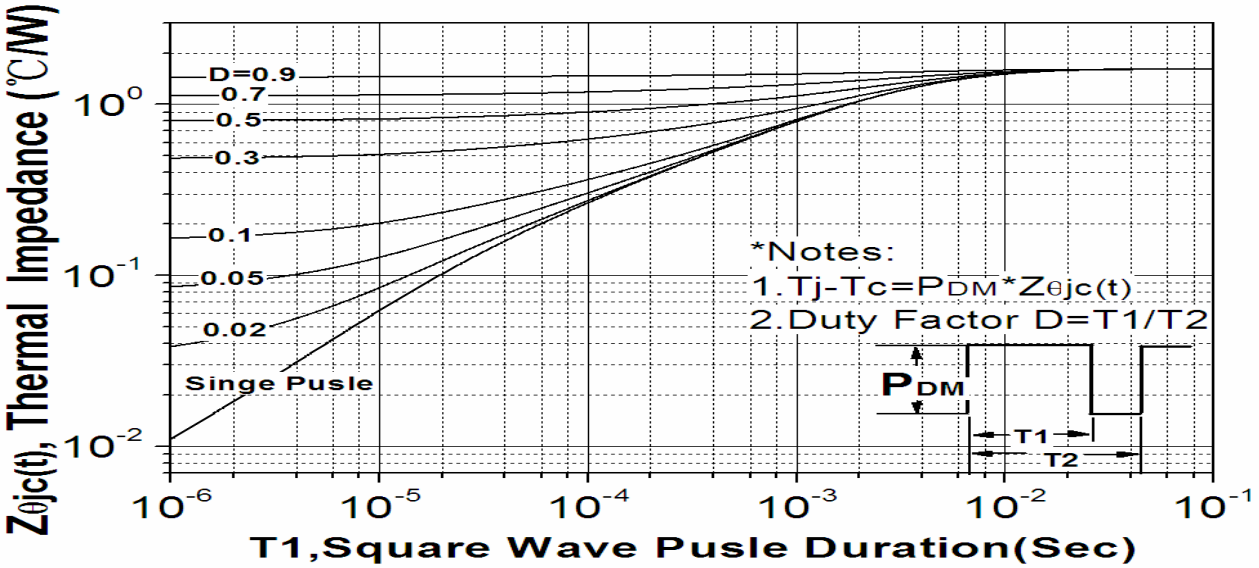


Figure 11. Thermal Resistance Characteristics



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Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel:5Kpcs/Reel

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

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