Micro Commercial Components

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MCAC80N06Y

N-Channel Power MOSFET

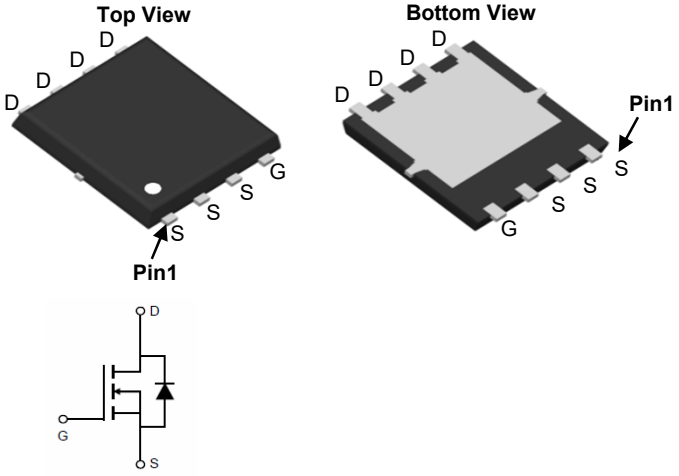
Features

- Trench Power MV MOSFET technology
- Very low on-resistance $R_{DS(ON)}$
- 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		60	V
I_D	Drain Current-Continuous (Note 7)	T_C = 25°C T_C = 100°C	80 58	A
I_{DM}	Pulsed Drain Current (Note 3)		320	A
R_{thJA}	Maximum Junction to Ambient	t ≤ 10s(Note1) Steady-State(Note1,4)	15 43	°C/W
R_{thJC}	Maximum Junction to Case	Steady-State	1.47	°C/W
V_{GS}	Gate-source Voltage		±20	V
P_{DSM}	Maximum Power Dissipation (Note 1)	T_c = 25°C T_c = 100°C	85 34	W
E_{AS}	Single pulse avalanche energy (Note 3)		450	mj
T_J	Operating Junction Temperature		-55 to +150	°C
T_{STG}	Storage Temperature		-55 to +150	°C

EQUIVALENT CIRCUIT



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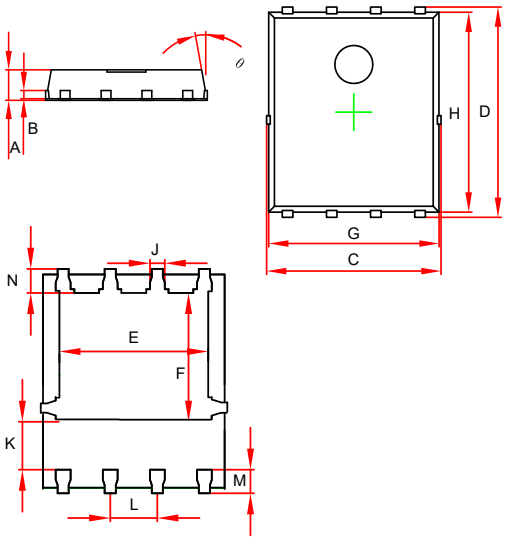


Dimensions					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	.039	0.900	1.000	
B	0.010REF.		0.254REF.		
C	0.193	0.200	4.900	5.100	
D	0.232	0.240	5.900	6.100	
E	0.148	0.163	3.750	4.150	
F	0.130	0.142	3.300	3.600	
G	0.189	0.197	4.800	5.000	
H	0.222	0.230	5.650	5.850	
K	0.047	0.059	1.200	1.500	
J	0.014	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	

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	60	65		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, 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	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=40A		3.5	4.2	mΩ
		V_{GS}=4.5V, I_D=40A		4.0	5.2	mΩ
g_{FS}	Diode Forward Voltage	V_{DS}=5V, I_D=40A	30			S
V_{SD}	Diode Forward Voltage	I_S=40A,V_{GS}=0V		0.85	0.99	V
I_S	Maximum Body-Diode Continuous Current (Note 7)				80	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, f=1MHz		3980		pF
C_{oss}	Output Capacitance			690		pF
C_{rss}	Reverse Transfer Capacitance			24		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		2.5		Ω
SWITCHING PARAMETERS						
Q_g(10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=40A		67		nC
Q_g(4.5V)	Total Gate Charge			32		nC
Q_{gs}	Gate Source Charge			12		nC
Q_{gd}	Gate Drain Charge			8.5		nC
$t_{D(on)}$	Turn-on Delay Time	V_{GS}=10V, V_{DS}=15V, R_L=2.5Ω, R_{GEN}=3Ω		15		ns
t_r	Turn-on Rise Time			8		ns
$t_{D(off)}$	Turn-off Delay Time			48		ns
t_f	Turn-off Fall Time			12		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=Is ,di/dt=500A/us		48		ns
Q_{rr}	Body Diode Reverse Recovery charge	I_F=Is ,di/dt=500A/us		60		nC

Note:

1. The value of $R_{\theta JA}$ 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

Fig 1: Output Characteristics

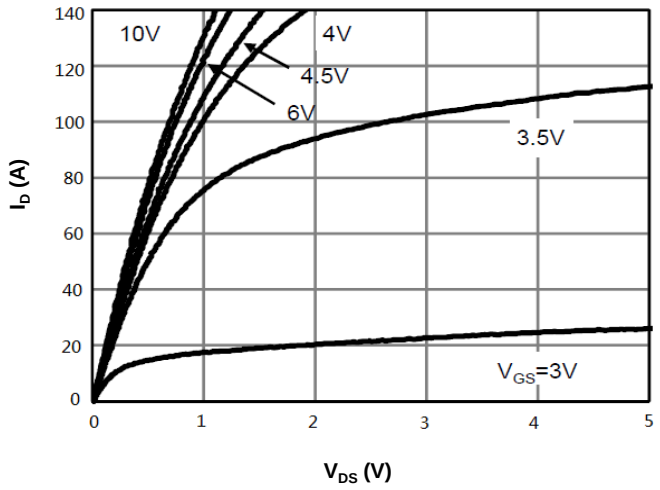


Fig 2: Transfer Characteristics

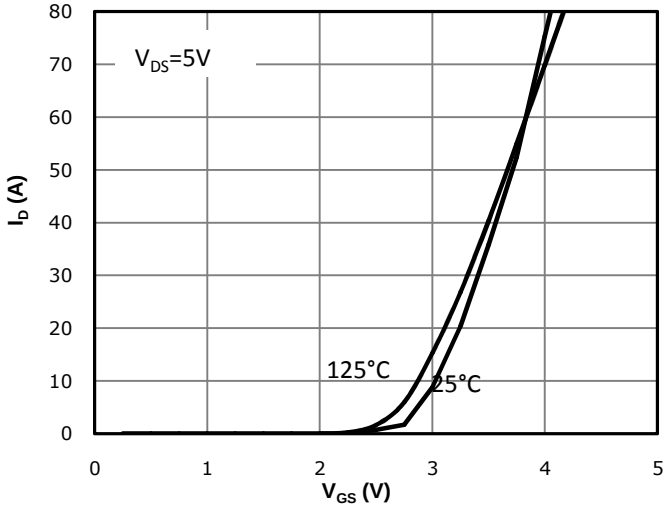


Fig 3: Rds(on) vs Drain Current and Gate Voltage

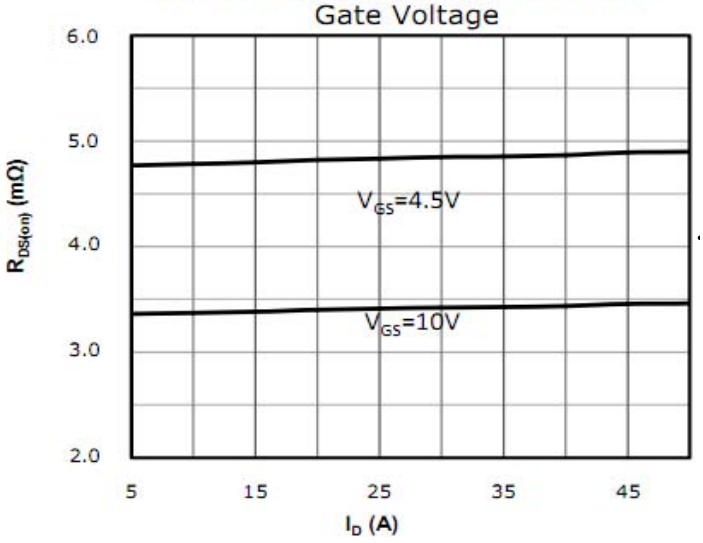


Fig 4: Capacitance Characteristics

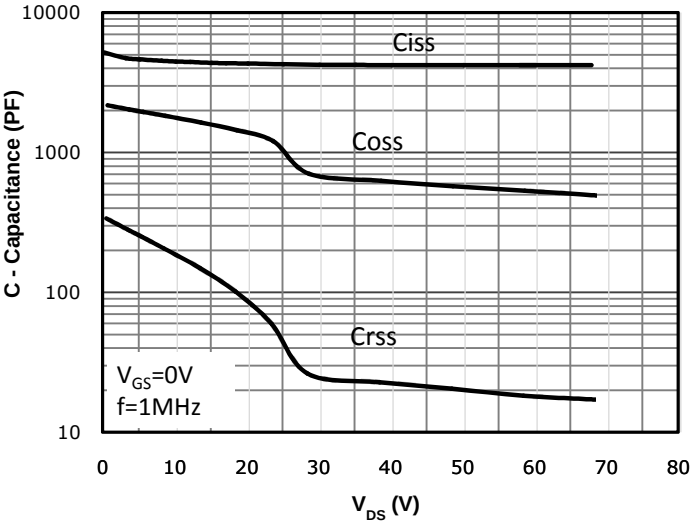


Fig 5: Rds(on) vs. Temperature

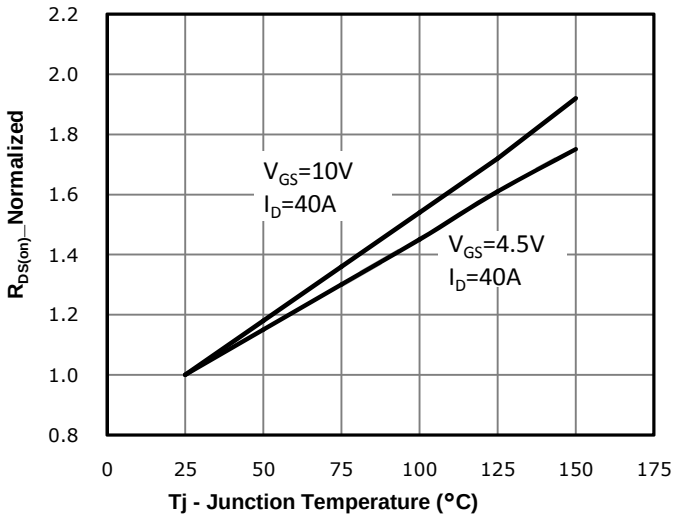
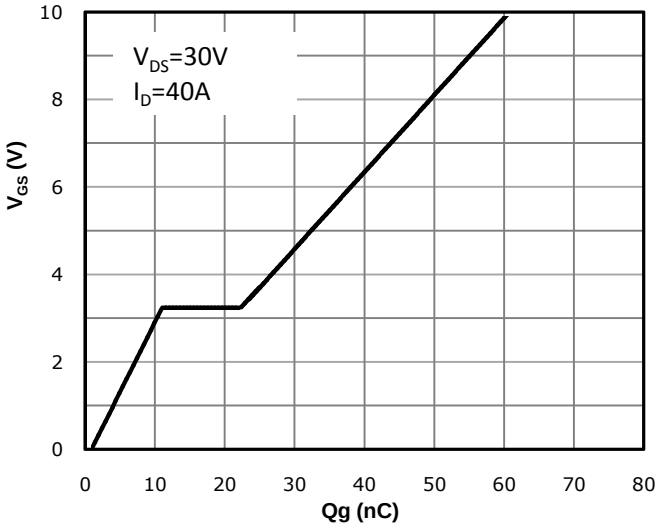


Fig 6: Gate Charge Characteristics



Typical Electrical and Thermal Characteristics

Fig 7: Body-diode Forward Characteristics

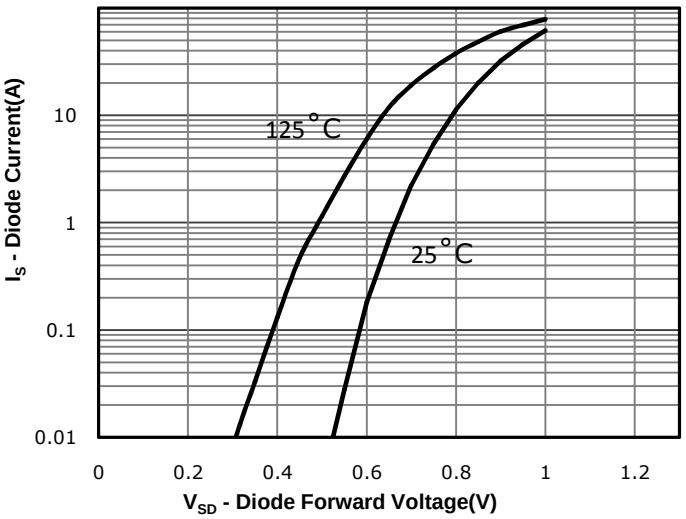


Fig 8: Drain Current Derating

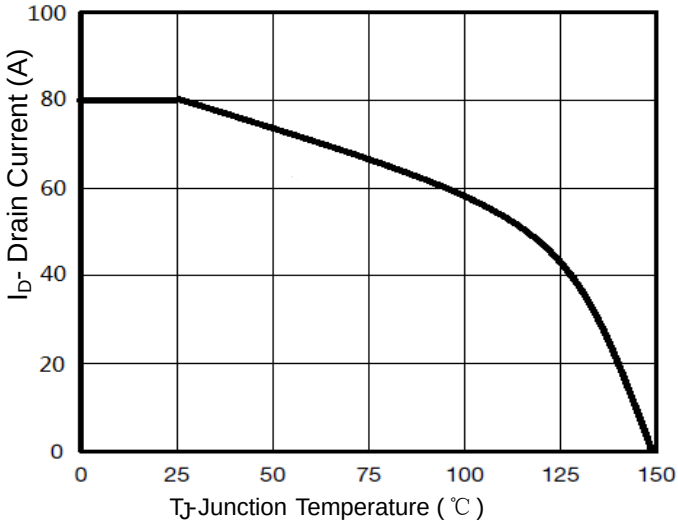


Fig 9: Power Dissipation

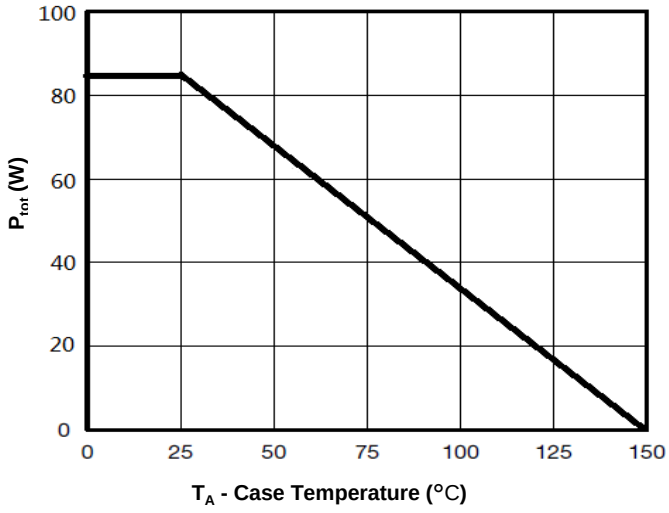
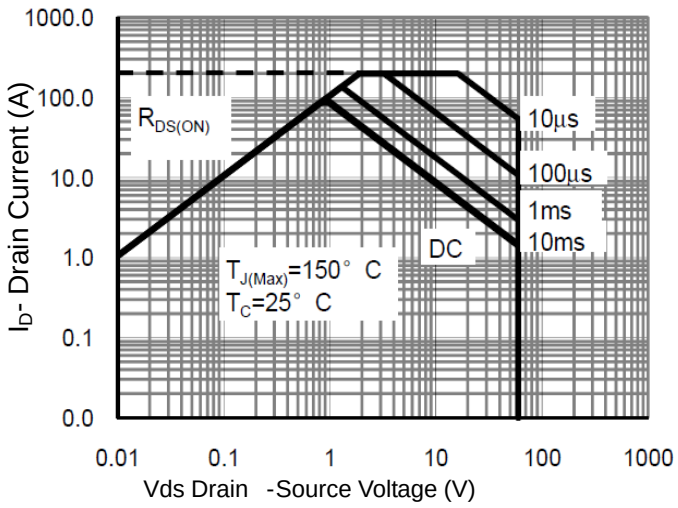
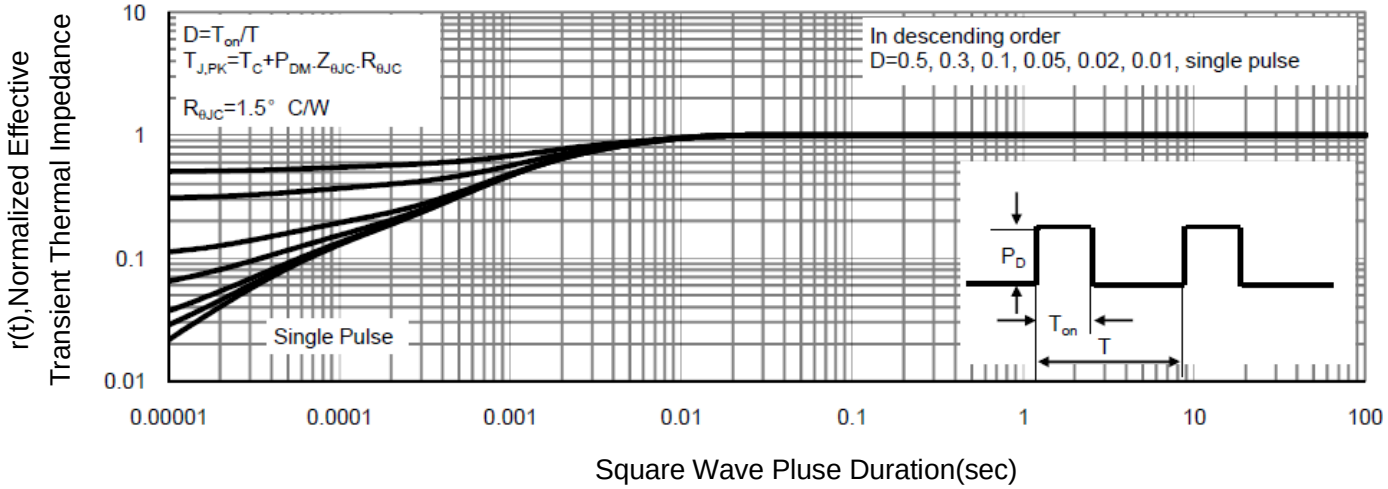


Fig 10: Safe Operation Area





Square Wave Pluse Duration(sec)

Fig 11: Normalized Maximum Transient Thermal Impedance

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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