



Micro Commercial Components



Micro Commercial Components  
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# MCAC80N06Y

## N-Channel Power MOSFET

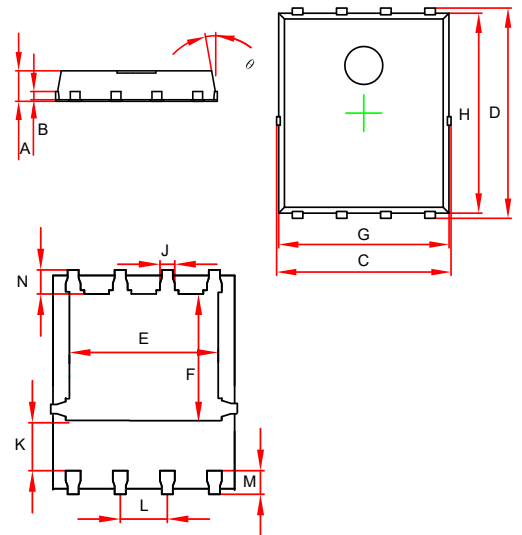
### Features

- 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

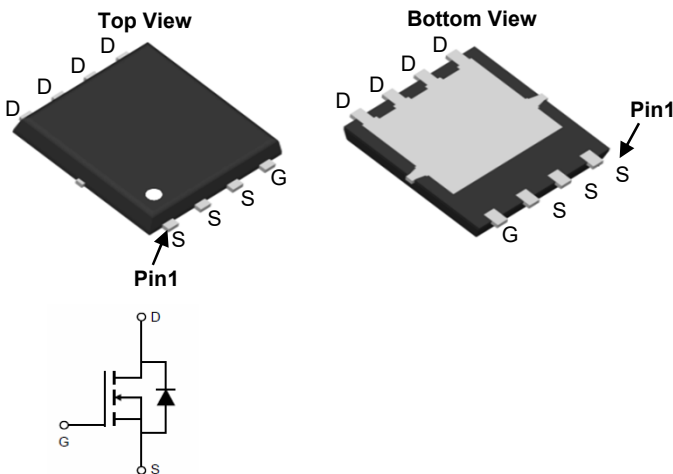
Symbol	Parameter	Rating	Unit	
$V_{DS}$	Drain-source Voltage	60	V	
$I_D$	Drain Current-Continuous (Note 7)	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	58	A
$I_{DM}$	Pulsed Drain Current (Note 3)	320	A	
$R_{thJA}$	Maximum Junction to Ambient $t \leq 10\text{s}$ (Note1) Steady-State(Note1,4)		15	$^\circ\text{C/W}$
			43	$^\circ\text{C/W}$
$R_{thJC}$	Maximum Junction to Case Steady-State	1.47	$^\circ\text{C/W}$	
$V_{GS}$	Gate-source Voltage	$\pm 20$	V	
$P_{DSM}$	Maximum Power Dissipation (Note 1)	$T_C = 25^\circ\text{C}$	85	W
		$T_C = 100^\circ\text{C}$	34	W
$E_{AS}$	Single pulse avalanche energy (Note 3)	450	mj	
$T_J$	Operating Junction Temperature	-55 to +150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature	-55 to +150	$^\circ\text{C}$	

### DFN5060



DIM	Dimensions				NOTE
	INCHES		MM		
	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	

### EQUIVALENT CIRCUIT



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	60	65		V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1	$\mu\text{A}$
					5	
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.1	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$ , $I_D=40\text{A}$		3.5	4.2	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=40\text{A}$		4.0	5.2	$\text{m}\Omega$
$g_{FS}$	Diode Forward Voltage	$V_{DS}=5\text{V}$ , $I_D=40\text{A}$	30			S
$V_{SD}$	Diode Forward Voltage	$I_S=40\text{A}$ , $V_{GS}=0\text{V}$		0.85	0.99	V
$I_S$	Maximum Body-Diode Continuous Current (Note 7)				80	A
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0\text{V}$ , $V_{DS}=30\text{V}$ , $f=1\text{MHz}$		3980		pF
$C_{oss}$	Output Capacitance			690		pF
$C_{rss}$	Reverse Transfer Capacitance			24		pF
$R_g$	Gate resistance	$V_{GS}=0\text{V}$ , $V_{DS}=0\text{V}$ , $f=1\text{MHz}$		2.5		$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}$ , $V_{DS}=30\text{V}$ , $I_D=40\text{A}$		67		nC
$Q_g(4.5\text{V})$	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	$V_{GS}=10\text{V}$ , $V_{DS}=15\text{V}$ , $R_L=2.5\Omega$ , $R_{GEN}=3\Omega$		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	$I_F=I_S$ , $di/dt=500\text{A/us}$		48		ns
$Q_{rr}$	Body Diode Reverse Recovery charge	$I_F=I_S$ , $di/dt=500\text{A/us}$		60		nC

Note:

- 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  $T_A=25^\circ\text{C}$ . The Power dissipation PDSM is based on  $R_{\theta JA} t \leq 10\text{s}$  and the maximum allowed junction temperature of  $150^\circ\text{C}$ . The value in any given application depends on the user's specific board design.
- The power dissipation PD is based on  $T_J(\text{MAX})=175^\circ\text{C}$ , using junction - to - case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- Single pulse width limited by junction temperature  $T_J(\text{MAX})=175^\circ\text{C}$ .
- The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to case  $R_{\theta JC}$  and case to ambient.
- The static characteristics in Figures 1 to 6 are obtained using  $<300\text{ns}$  pulses, duty cycle 0.5% max.
- 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  $T_J(\text{MAX})=175^\circ\text{C}$ . The SOA curve provides a single pulse rating.
- The maximum current rating is package limited.

## Typical Electrical and Thermal Characteristics

Fig 1: Output Characteristics

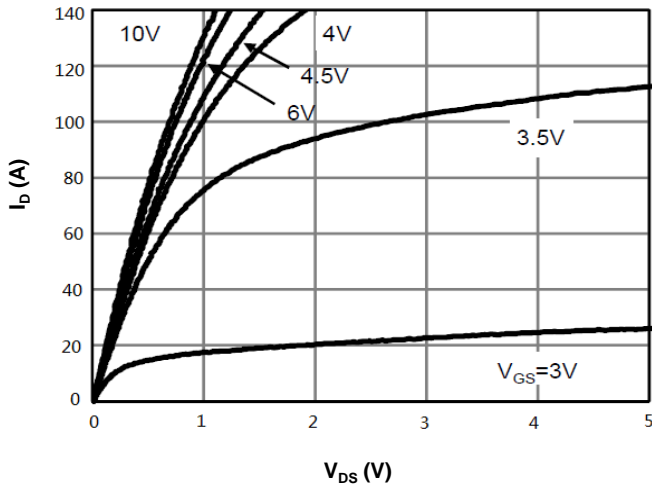


Fig 2: Transfer Characteristics

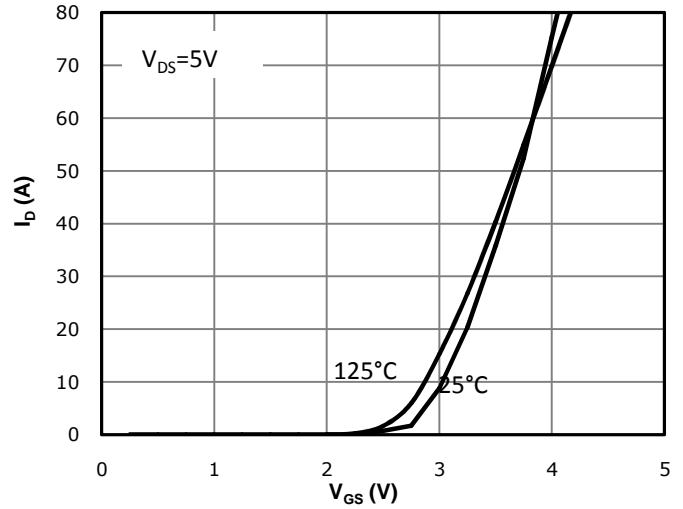


Fig 3:  $R_{DS(on)}$  vs Drain Current and Gate Voltage

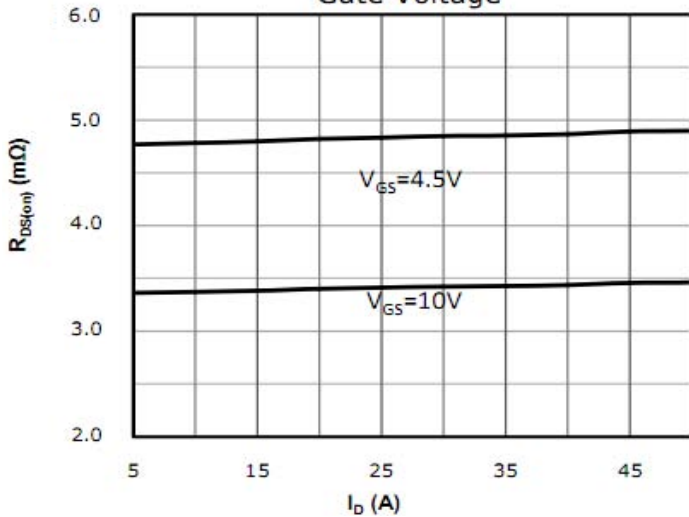


Fig 4: Capacitance Characteristics

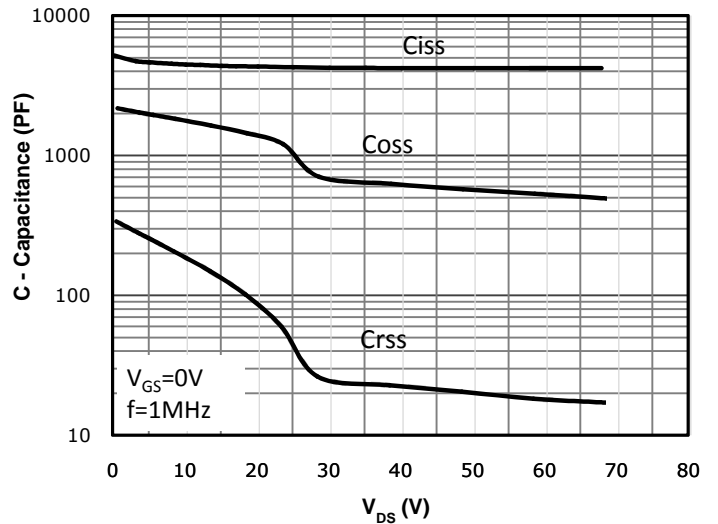


Fig 5:  $R_{DS(on)}$  vs. Temperature

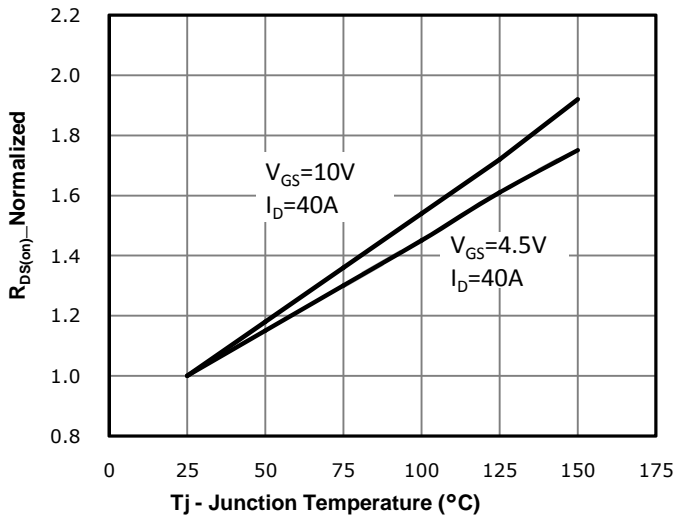
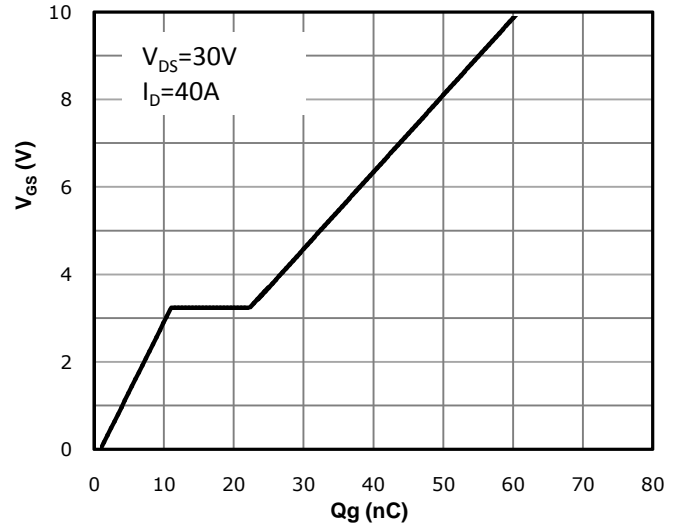


Fig 6: Gate Charge Characteristics



**Typical Electrical and Thermal Characteristics**

Fig 7: Body-diode Forward Characteristics

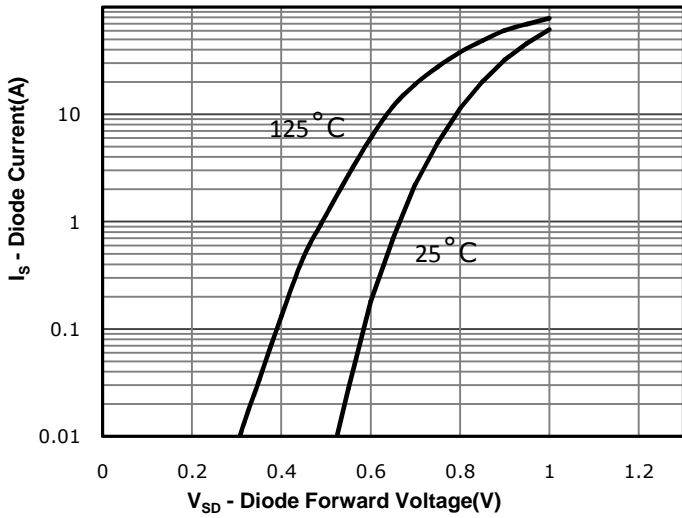


Fig 8: Drain Current Derating

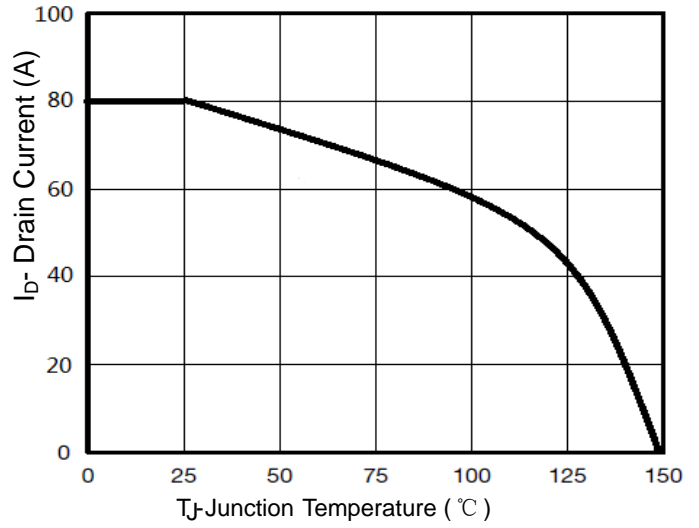


Fig 9: Power Dissipation

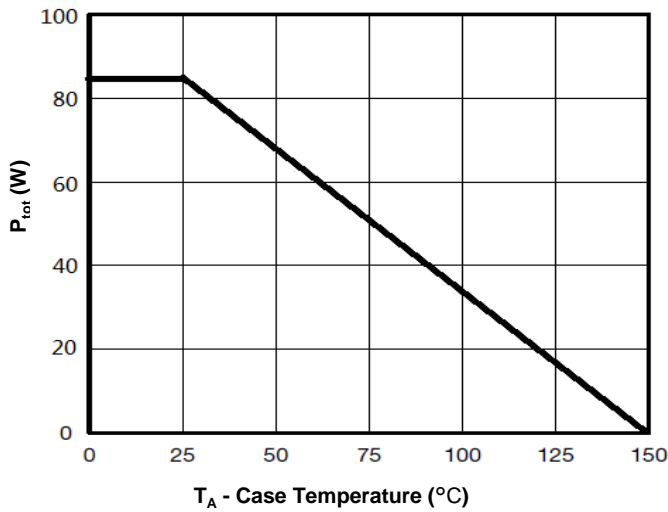


Fig 10: Safe Operation Area

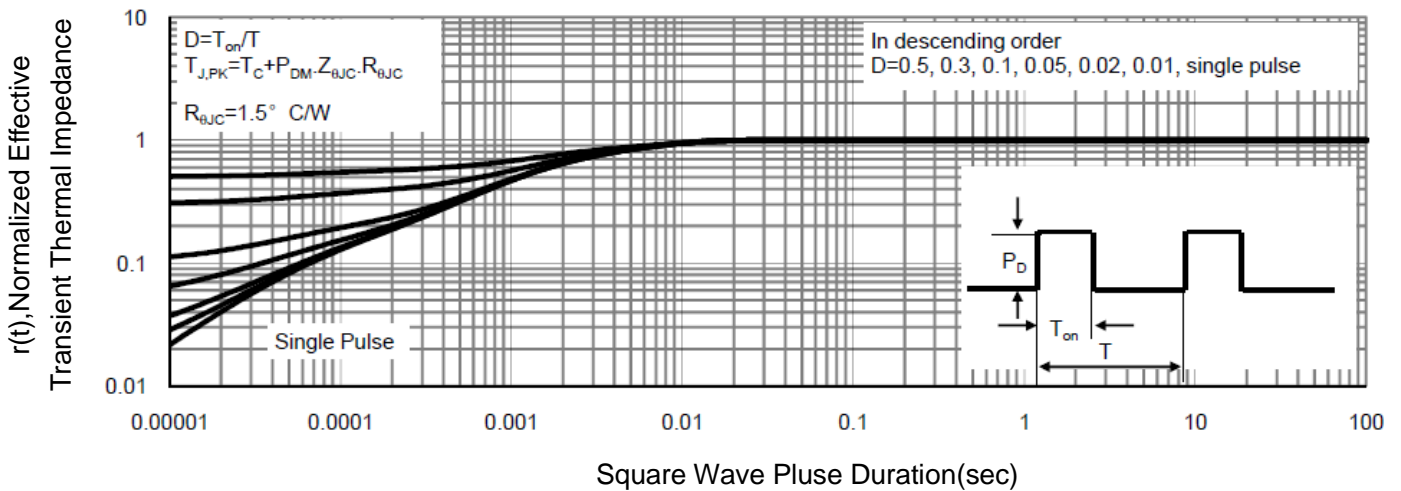
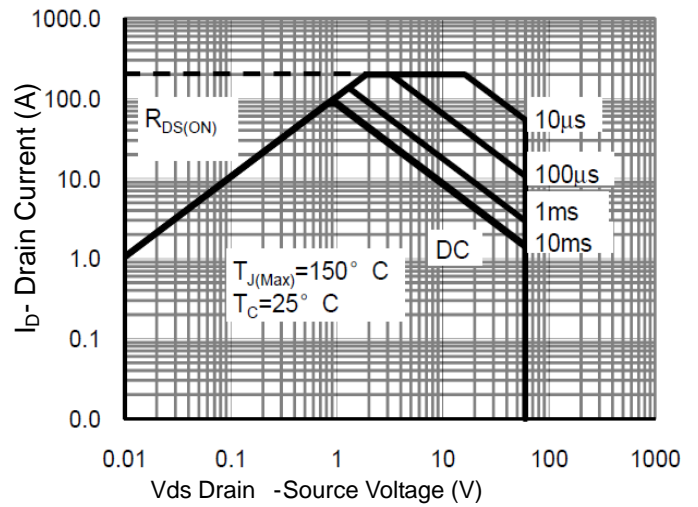


Fig 11: Normalized Maximum Transient Thermal Impedance



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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

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