



Micro Commercial Components



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MCQ12N06

N-Channel Power MOSFET

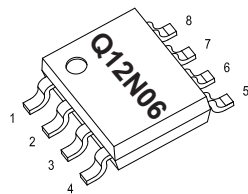
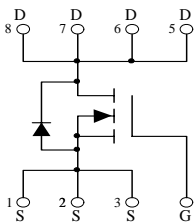
Features

- Split Gate Trench Power MV MOSFET Technology
- Halogen free available upon request by adding suffix "-HF"
- Epoxy meets UL 94 V-0 flammability rating
- Low Gate Charge

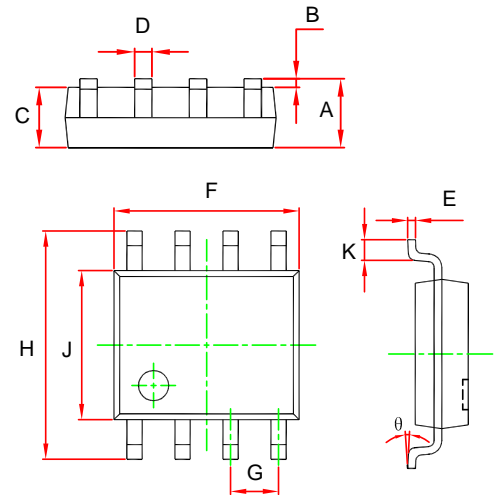
Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
V _{DS}	Drain-source Voltage	60	V
I _D	Drain Current-Continuous(note1)	12	A
I _{DM}	Pulsed Drain Current(note2)	48	A
V _{GS}	Gate-source Voltage	± 20	V
P _D	Power Dissipation	3.1	W
R _{θJA}	Thermal Resistance Junction to Ambient(note1)	40	°C/W
T _J	Operating Junction Temperature	-55 to +150	°C
T _{STG}	Storage Temperature	-55 to +150	°C

Equivalent Circuit



SOP-8



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.350	1.750	
B	0.004	0.010	0.100	0.250	
C	0.053	0.061	1.350	1.550	
D	0.013	0.020	0.330	0.510	
E	0.007	0.010	0.170	0.250	
F	0.189	0.197	4.800	5.000	
G	0.050 (BSC)		1.270 (BSC)		
H	0.228	0.244	5.800	6.200	
J	0.150	0.157	3.800	4.000	
K	0.016	0.050	0.400	1.270	
θ	0°	8°	0°	8°	

ELECTRICAL CHARACTERISTICS(T_a=25°C 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 T _J =55°C			1 5	μA
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 =12A V _{GS} =4.5V, I _D =12A		8.2 10.5	9.0 13.0	mΩ
g _{FS}	Diode Forward Voltage	V _{DS} =5V, I _D =12A	30			S
V _{SD}	Diode Forward Voltage	I _S =12A, V _{GS} =0V		0.83	0.99	V
I _S	Maximum Body-Diode Continuous Current				12	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, f=1MHz		1988		pF
C _{oss}	Output Capacitance			470		pF
C _{rss}	Reverse Transfer Capacitance			14		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.6		Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =12A		31		nC
Q _g (4.5V)	Total Gate Charge			16		nC
Q _{gs}	Gate Source Charge			6		nC
Q _{gd}	Gate Drain Charge			5		nC
t _{D(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =15V, R _L =2.5Ω, R _{GEN} =3Ω		10.5		ns
t _r	Turn-on Rise Time			4.5		ns
t _{D(off)}	Turn-off Delay Time			29.5		ns
t _f	Turn-off Fall Time			8		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =12A, di/dt=500A/μs		17		ns
Q _{rr}	Body Diode Reverse Recovery charge	I _F =12A, di/dt=500A/μs		58		nC

Typical Characteristics

Fig 1: Output Characteristics

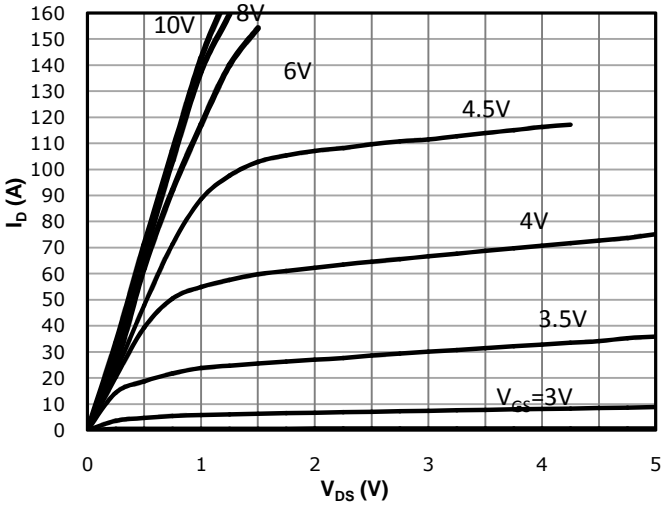


Fig 2: Transfer Characteristics

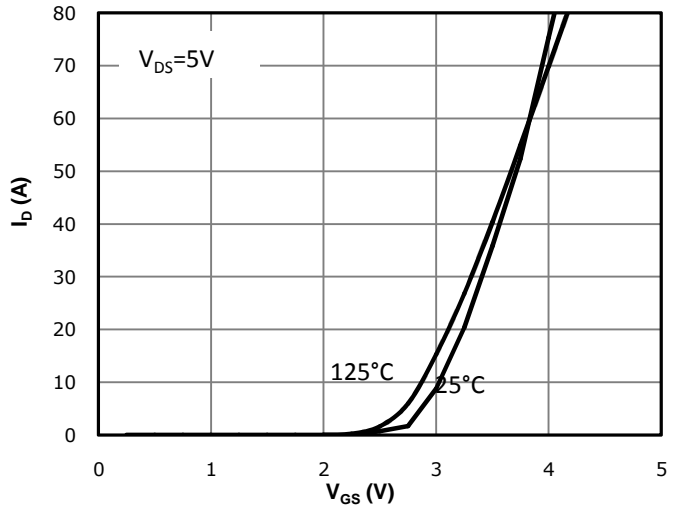


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

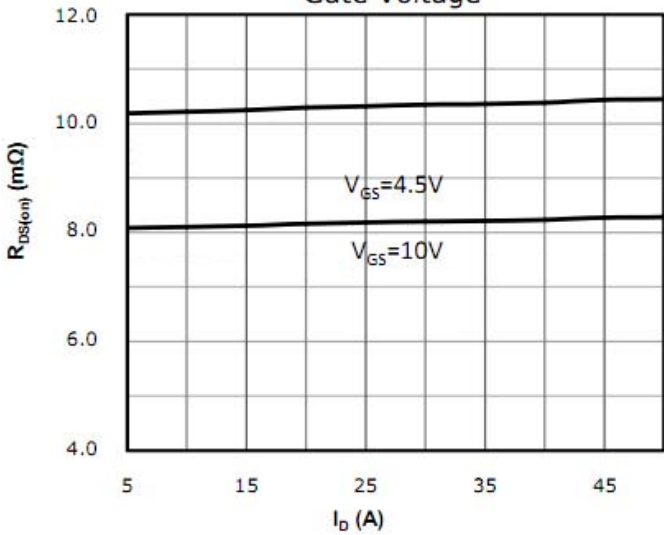


Fig 4: $R_{DS(on)}$ vs Gate Voltage

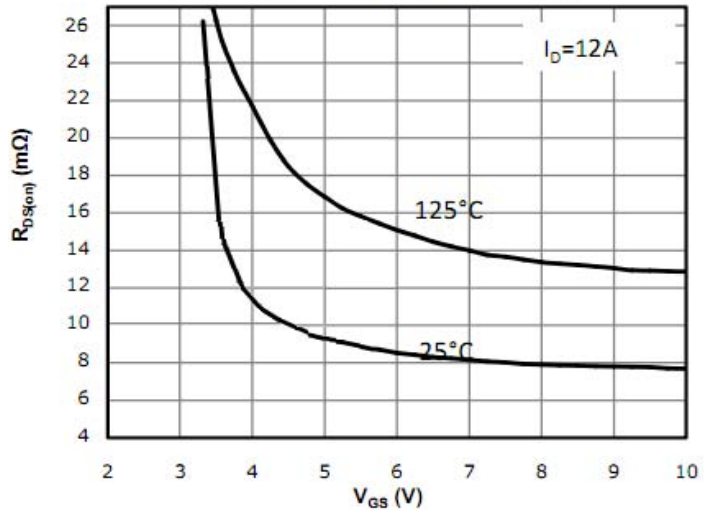


Fig 5: $R_{DS(on)}$ vs. Temperature

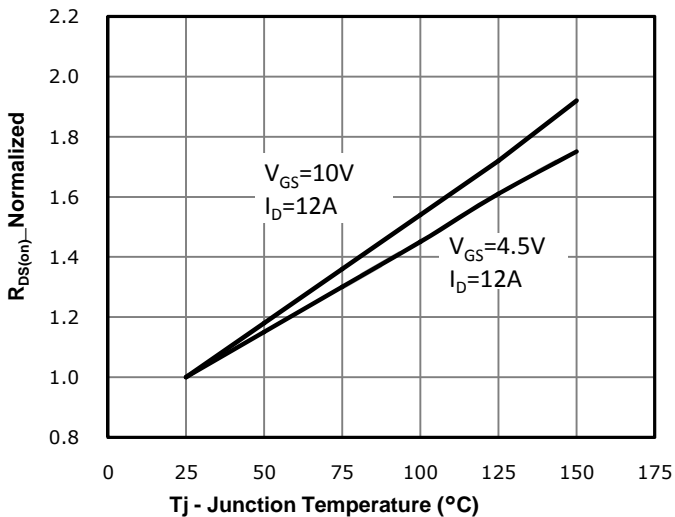
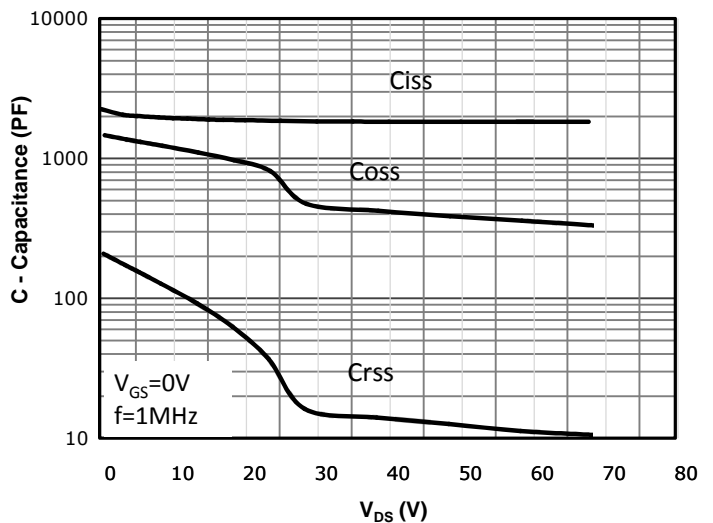


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

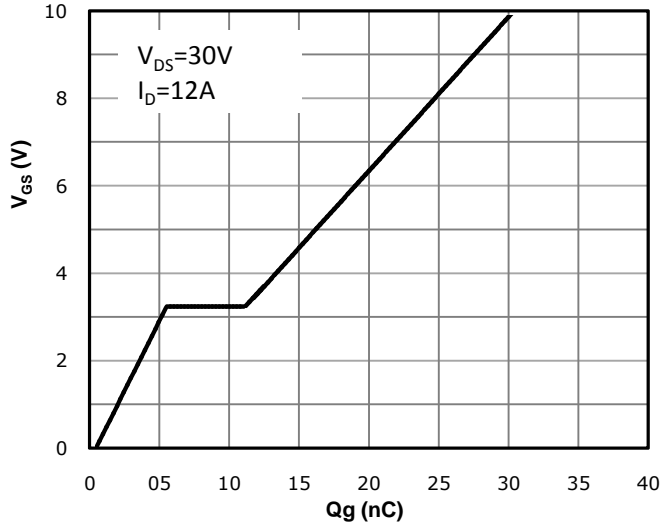


Fig 8: Body-diode Forward Characteristics

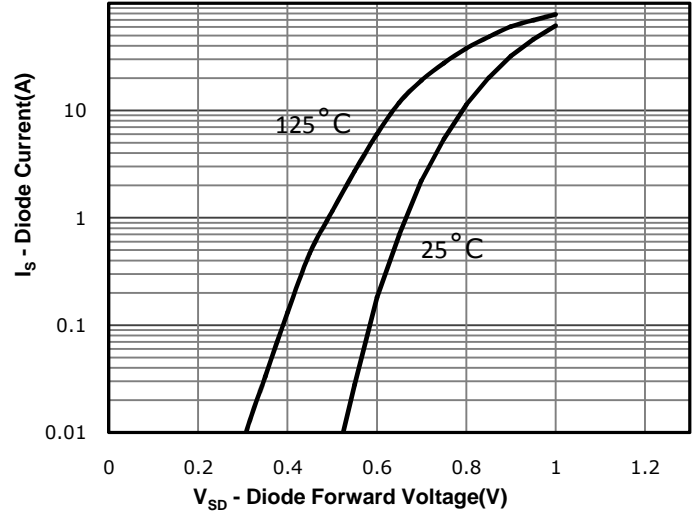


Fig 9: Power Dissipation

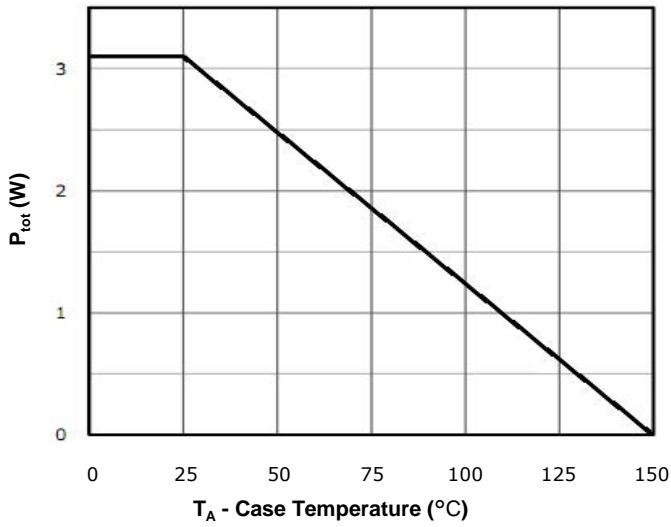
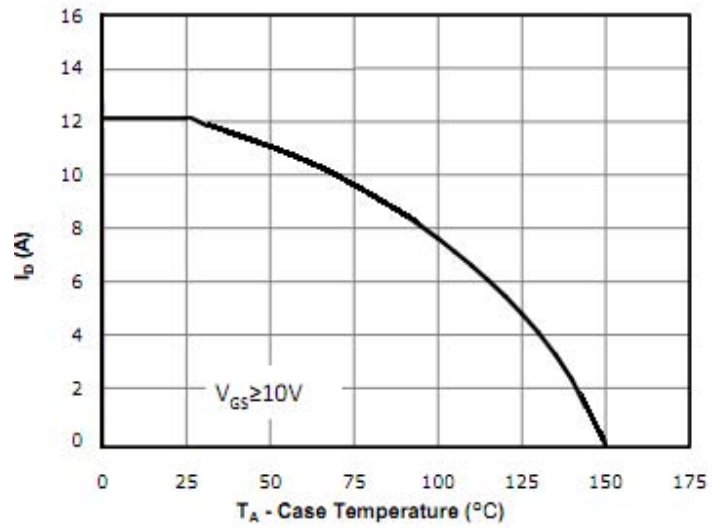


Fig 10: Drain Current Derating





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Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel:4Kpcs/Reel

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

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