

Features

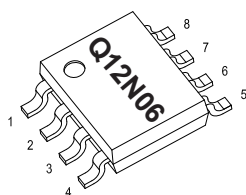
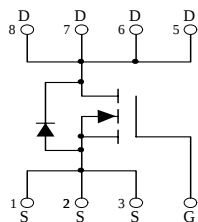
- Split Gate Trench Power MV MOSFET Technology
- Low Gate Charge
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 40°C/W Junction to Ambient

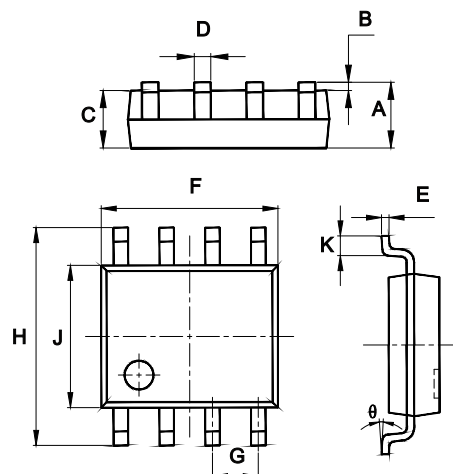
Parameter	Symbol	Rating	Unit
Drain -source Voltage	V_{DS}	60	V
Gate -Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	12	A
Drain Current-Pulse ^(Note 2)	I_{DM}	48	A
Power Dissipation	P_D	3.1	W

Internal Structure



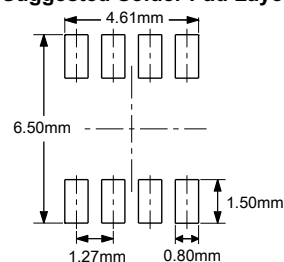
N-Channel Power MOSFET

SOP-8



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.35	1.75	
B	0.004	0.010	0.10	0.25	
C	0.053	0.061	1.35	1.55	
D	0.013	0.020	0.33	0.51	
E	0.007	0.010	0.17	0.25	
F	0.185	0.200	4.70	5.10	
G	0.050		1.270		TYP.
H	0.228	0.244	5.80	6.20	
J	0.150	0.157	3.80	4.00	
K	0.016	0.050	0.40	1.27	
θ	0°	8°	0°	8°	

Suggested Solder Pad Layout



ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	65		V
Gate-Threshold Voltage ^(Note 1)	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	1.7	2.5	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$ $T_J=55^\circ C$			1	μA
					5	
Drain-Source On-Resistance ^(Note 1)	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$		8.2	9.0	m Ω
		$V_{GS}=4.5V, I_D=12A$		10.5	13	
Forward Transconductance ^(Note 1)	g_{FS}	$V_{DS}=5V, I_D=12A$	30			S
Diode Forward Voltage ^(Note 1)	V_{SD}	$V_{GS}=0V, I_S=12A$		0.83	0.99	V
Maximum Body-Diode Continuous Current	I_S				12	A
Dynamic Characteristics^(Note 2)						
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		1988		pF
Output Capacitance	C_{oss}			470		
Reverse Transfer Capacitance	C_{rss}			14		
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		1.6		Ω
Switching Characteristics^(Note 2)						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=15V,$ $R_{GEN}=3\Omega, R_L=2.5\Omega$		10.5		ns
Turn-On Rise Time	t_r			4.5		
Turn-Off Delay Time	$t_{d(off)}$			29.5		
Turn-Off Fall Time	t_f			8.0		
Total Gate Charge(10V)	Q_g	$V_{GS}=10V, V_{DS}=30V, I_D=12A$		31		nC
Total Gate Charge(4.5V)				16		
Gate-Source Charge	Q_{gs}			6.0		
Gate-Drain Charge	Q_{gd}			5.0		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=12A, di/dt=500A/\mu s$		17		ns
Body Diode Reverse Recovery charge	Q_{rr}			58		nC

Curve Characteristics

Fig. 1 - Output Characteristics

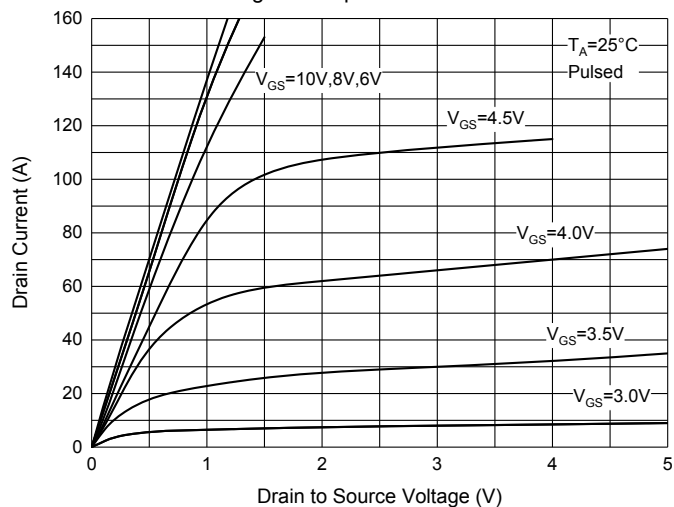


Fig. 2 - Transfer Characteristics

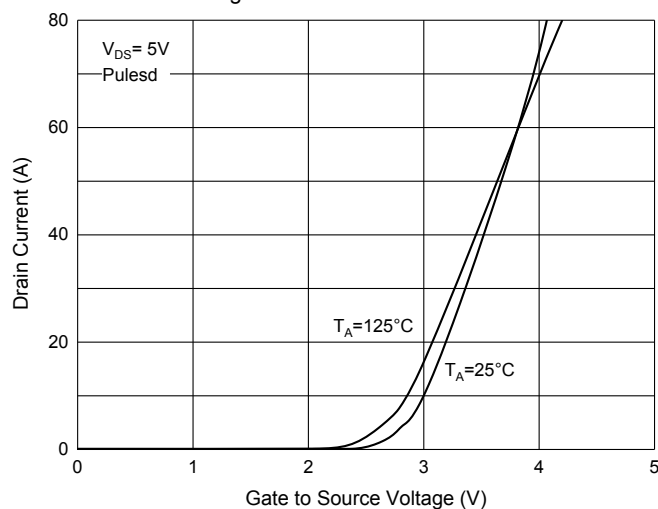


Fig. 3 - $R_{DS(ON)} - I_D$

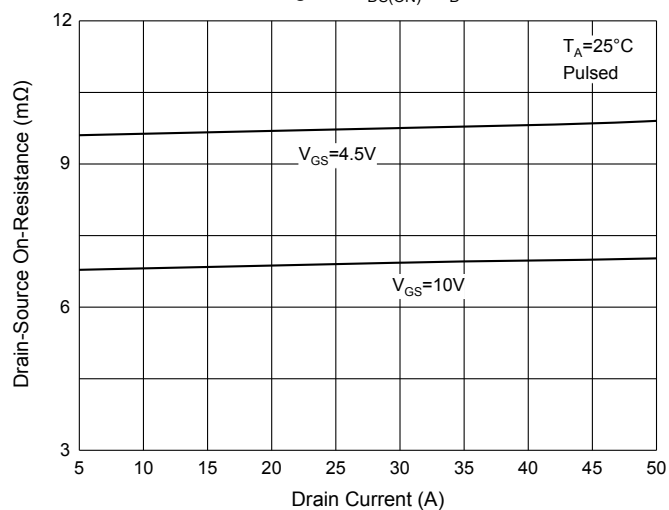


Fig. 4 - $I_S - V_{SD}$

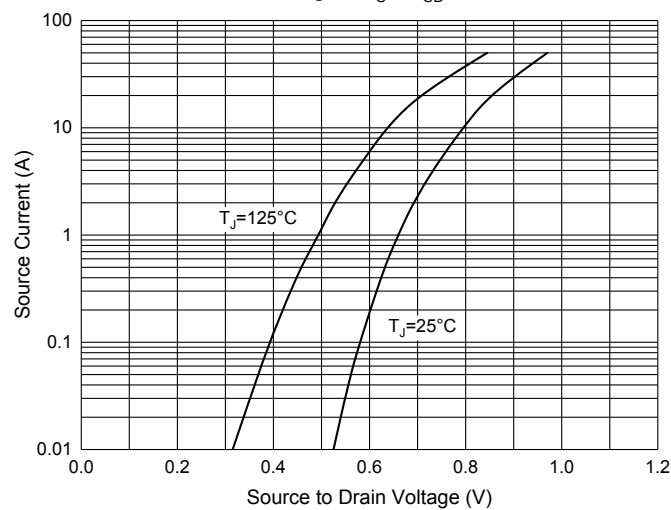


Fig. 5 - $R_{DS(ON)} - \text{Temperature}$

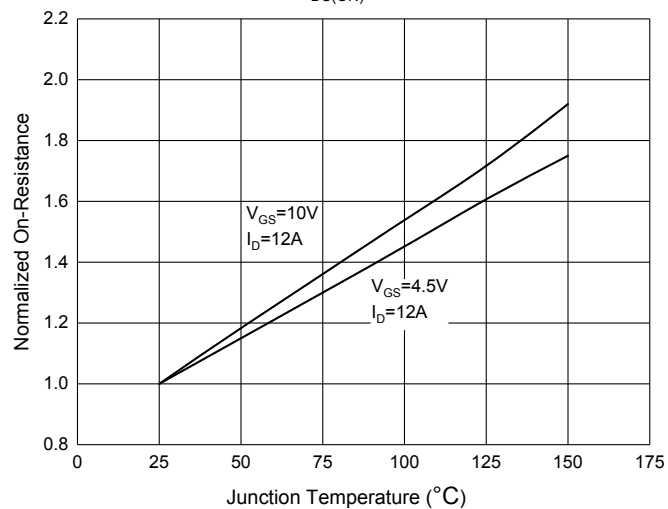
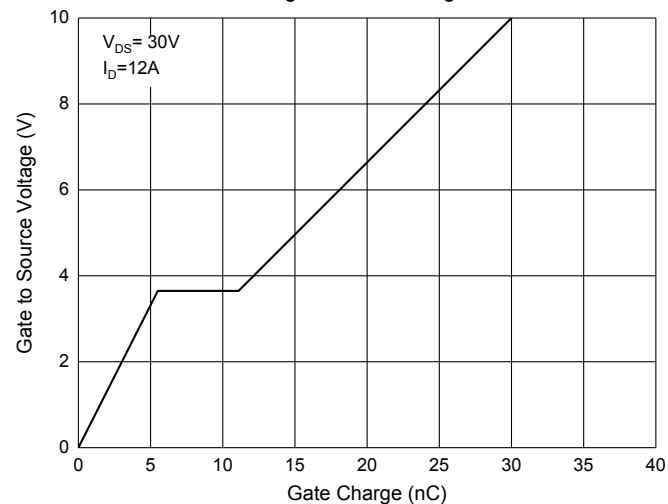


Fig. 6 - Gate Charge



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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