

### 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

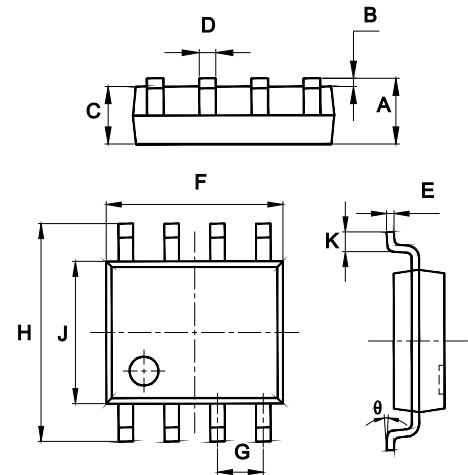
Parameter	Symbol	Rating	Unit
Drain -source Voltage	$V_{DS}$	60	V
Gate -Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous	$I_D$	12	A
Drain Current-Pulse <sup>(Note 1)</sup>	$I_{DM}$	48	A
Power Dissipation	$P_D$	3.1	W

Note:

1. Repetitive rating; pulse width limited by max. junction temperature.

# N-Channel Power MOSFET

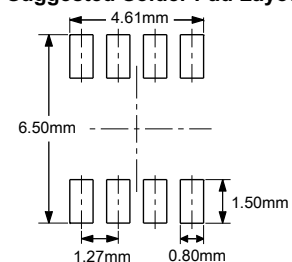
## SOP-8



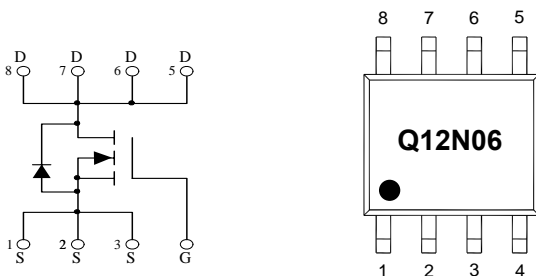
### DIMENSIONS

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



### Internal Structure and Marking Code



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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	65		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	1.7	2.5	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$ $T_J=55^\circ C$			1	$\mu A$
					5	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$		8.2	9.0	m $\Omega$
		$V_{GS}=4.5V, I_D=12A$		10.5	13	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=12A$	30			S
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=12A$		0.83	0.99	V
Maximum Body-Diode Continuous Current	$I_S$				12	A
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		1988		$\mu F$
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		$\Omega$
<b>Switching Characteristics</b>						
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

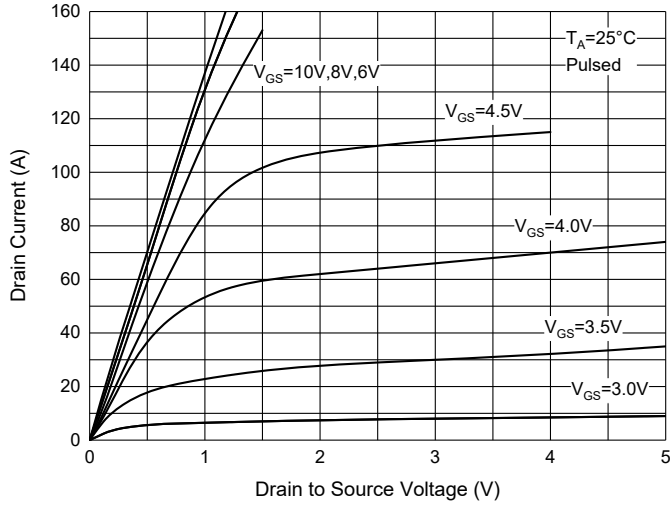


Fig. 2 - Transfer Characteristics

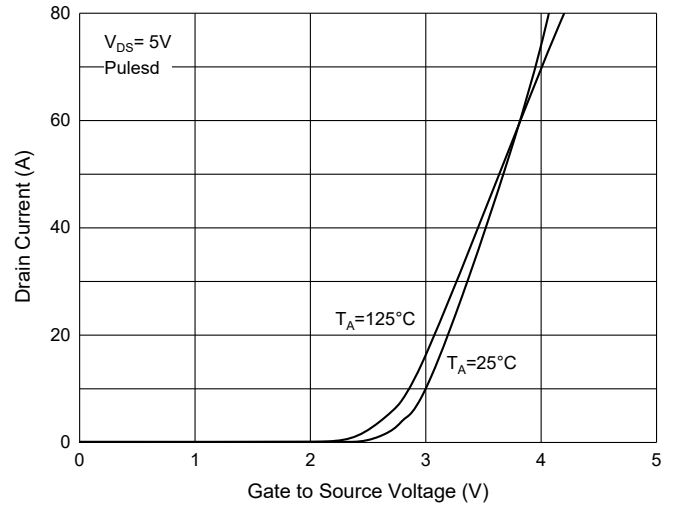


Fig. 3 -  $R_{DS(ON)} - I_D$

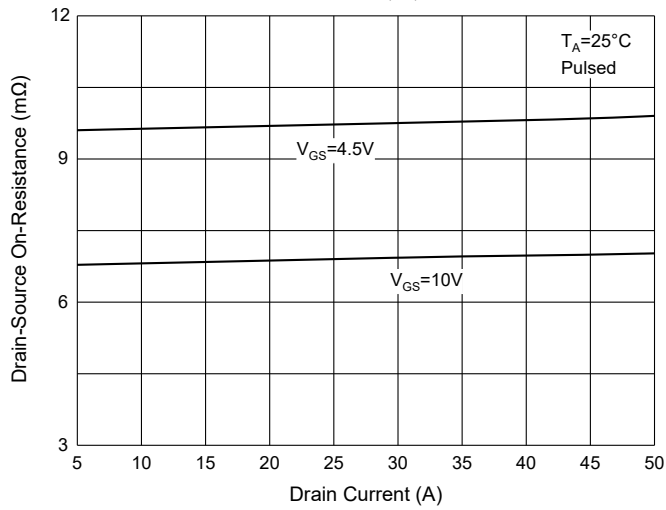


Fig. 4 -  $I_S - V_{SD}$

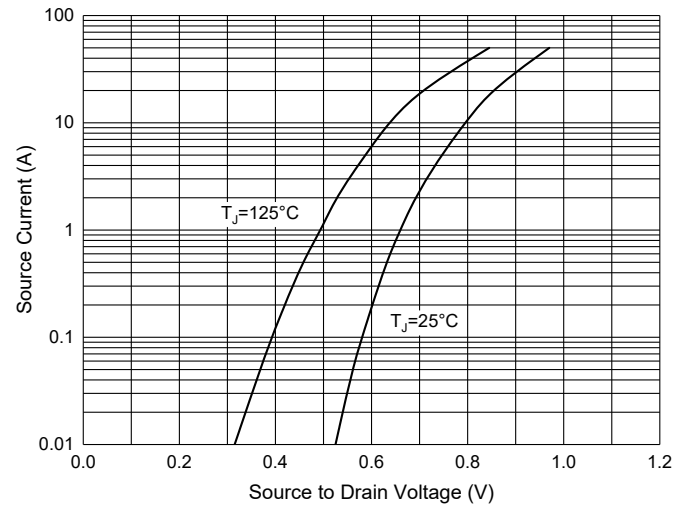


Fig. 5 -  $R_{DS(ON)} - \text{Temperature}$

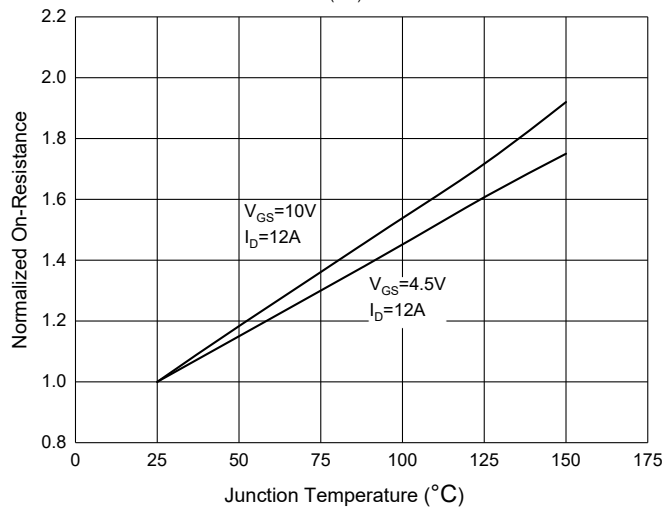
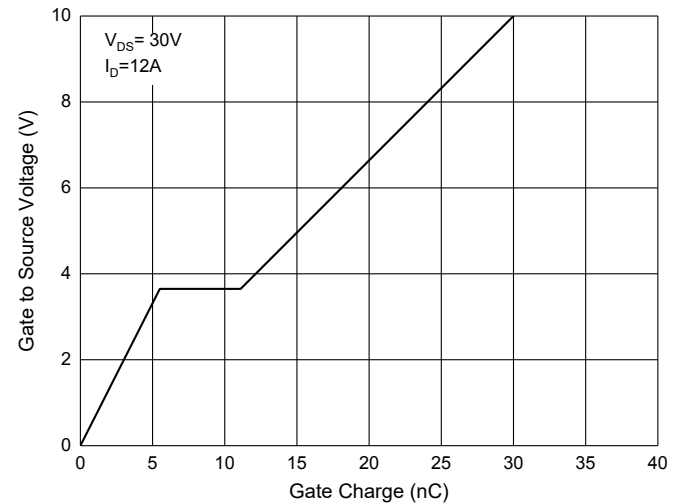
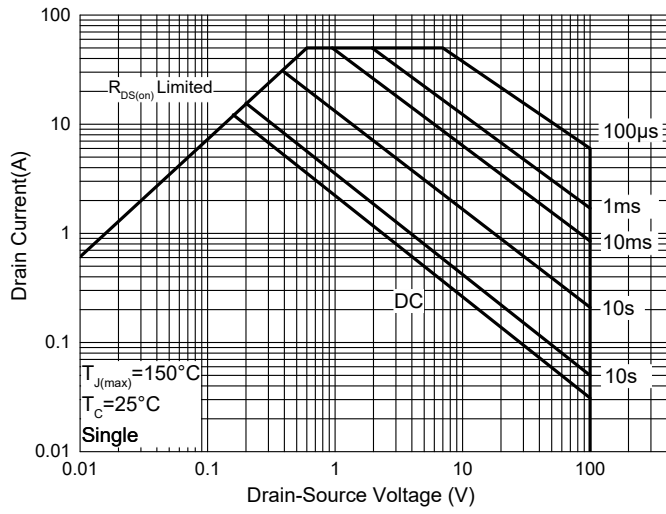


Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Safe Operation Area



## 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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