

### Features

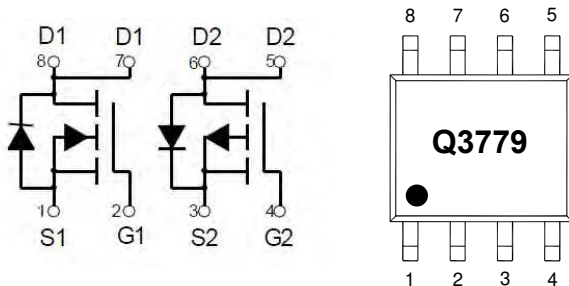
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

### Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient

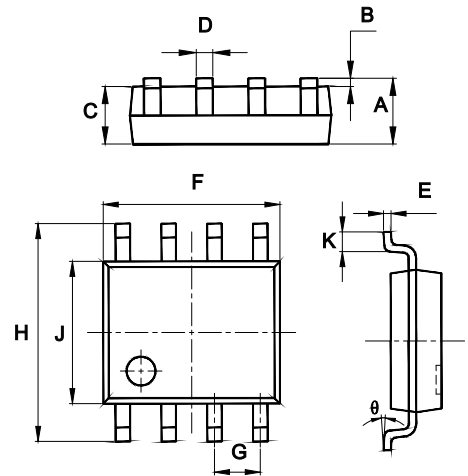
Parameter	Symbol	Rating	Unit
Total Power Dissipation	$P_D$	2	W
<b>N-Channel</b>			
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	3.4	A
Pulsed Drain Current	$I_{DM}$	14	A
<b>P-Channel</b>			
Drain-Source Voltage	$V_{DS}$	-100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-4	A
Pulsed Drain Current	$I_{DM}$	-20	A

### Internal Structure and Marking Code



## Dual N&P-Channel MOSFET

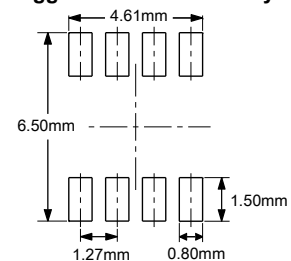
### SOP-8



#### 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	
$\theta$	0°	8°	0°	8°	

#### Suggested Solder Pad Layout



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

**N-Channel**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$		80	130	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=2.9A$	3			S
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				3.4	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=3A$			1.2	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		690		pF
Output Capacitance	$C_{oss}$			120		
Reverse Transfer Capacitance	$C_{rss}$			90		
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=3A$		15.5		
Gate-Source Charge	$Q_{gs}$			3.2		
Gate-Drain Charge	$Q_{gd}$			4.7		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=30V, I_D=2A, R_L=15\Omega, R_{GEN}=2.5\Omega$		11		ns
Turn-On Rise Time	$t_r$			7.4		
Turn-Off Delay Time	$t_{d(off)}$			35		
Turn-Off Fall Time	$t_f$			9.1		

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

**P-Channel**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-100V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.9	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=-4A$		170	200	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-15V, I_D=-4A$	12			S
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-4	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-4A$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$I_S=-4A, di/dt=100A/\mu s$		35		ns
Reverse Recovery Charge	$Q_{rr}$			46		nC
Forward Turn-On Time	$t_{on}$	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-25V, V_{GS}=0V, f=1MHz$		1055		pF
Output Capacitance	$C_{oss}$			65		
Reverse Transfer Capacitance	$C_{rss}$			41		
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-50V, V_{GS}=-10V, I_D=-10A$		25		nC
Gate-Source Charge	$Q_{gs}$			5		
Gate-Drain Charge	$Q_{gd}$			7		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-50V, I_D=-10A, R_{GEN}=9.1\Omega$		14		ns
Turn-On Rise Time	$t_r$			18		
Turn-Off Delay Time	$t_{d(off)}$			50		
Turn-Off Fall Time	$t_f$			18		

## Curve Characteristics N-Channel

Fig. 1 - Output Characteristics

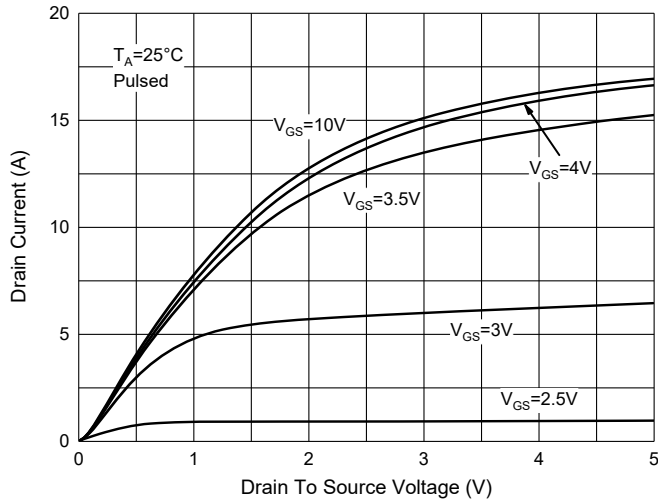


Fig. 2 - Transfer Characteristics

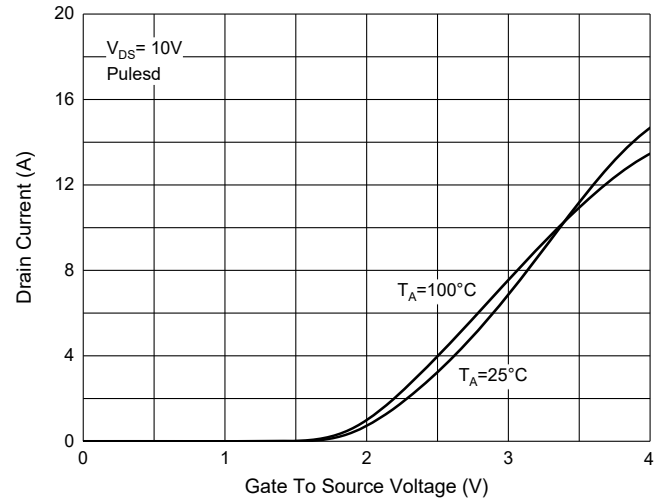


Fig. 3 -  $R_{DS(ON)} - I_D$

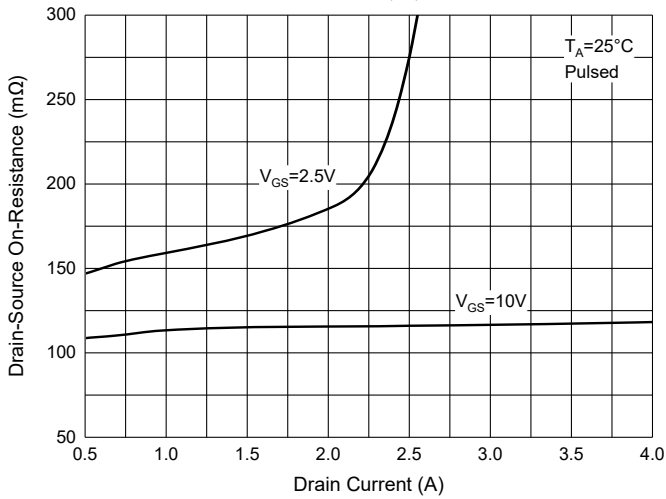


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

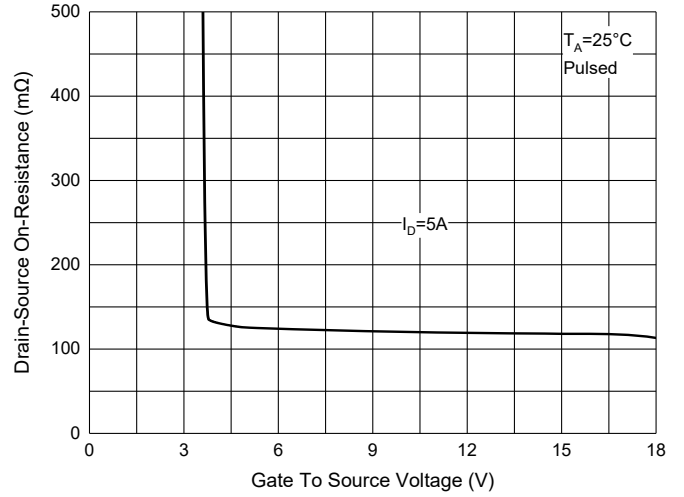


Fig. 5 -  $I_S - V_{SD}$

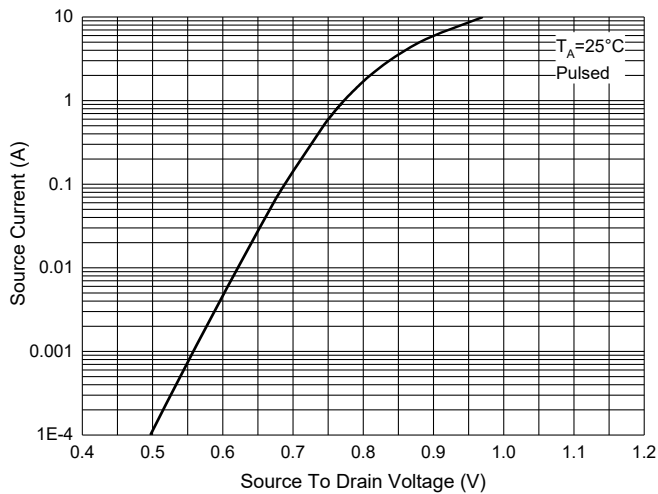
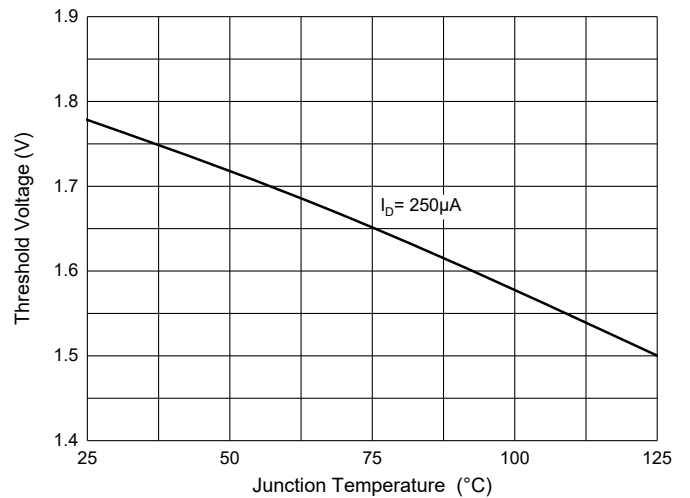


Fig. 6 - Threshold Voltage



**Curve Characteristics**  
**P-Channel**

Fig. 7 - Typical Output Characteristics

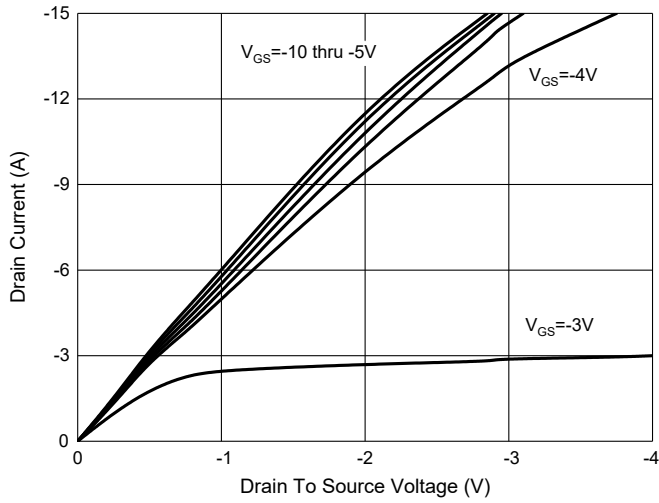


Fig. 8 - Transfer Characteristics

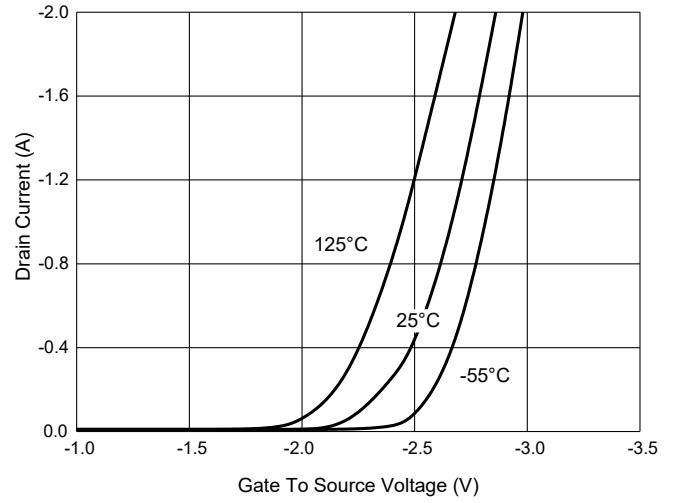


Fig. 9 -  $R_{DS(ON)} - I_D$

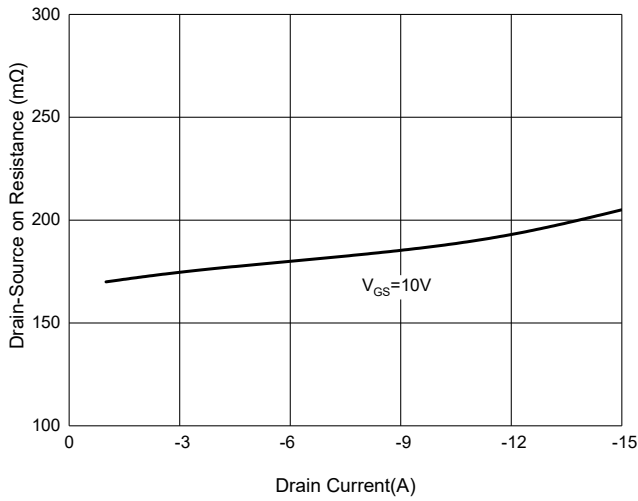


Fig. 10 - Normalized On Resistance Characteristics

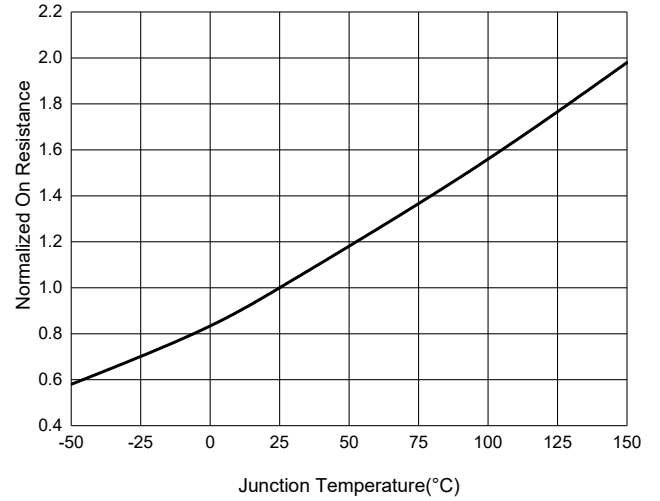


Fig. 11 - Gate Charge

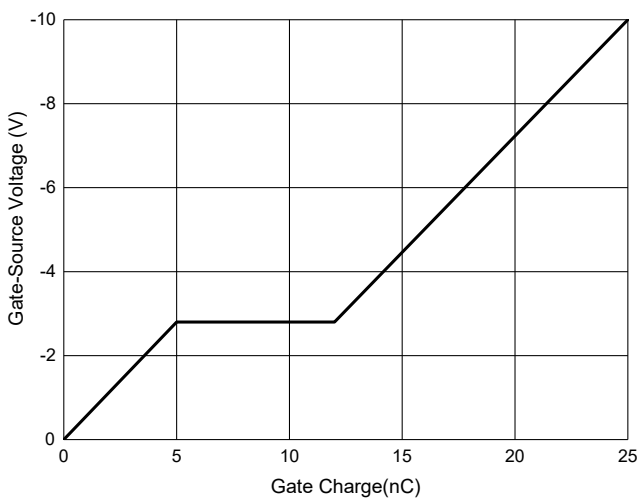
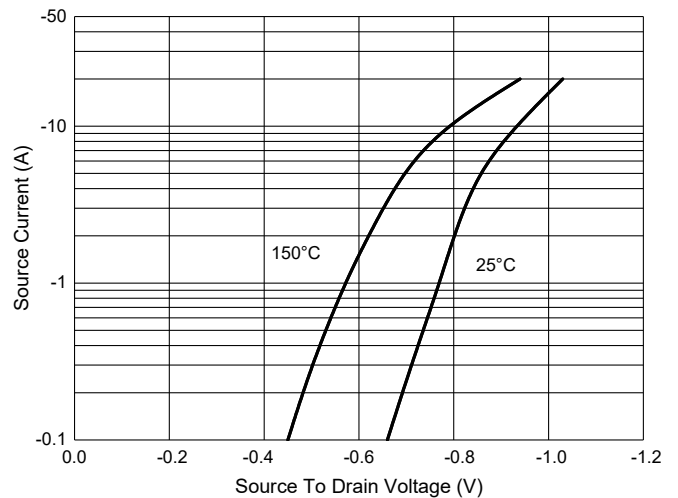


Fig. 12 -  $I_S - V_{SD}$



## 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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