Features

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

Dual N&P-Channel MOSFET

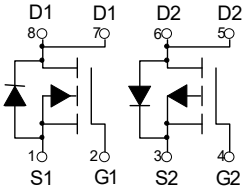
Maximum Ratings

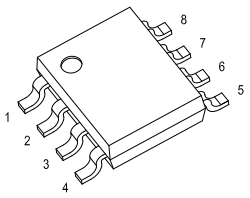
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Total Power Dissipation	P_D	2.0	W
N-Channel MOSFET			
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Volltage	V_{GS}	±20	V
Continuous Drain Current (Note 1)	I_D	4.5	A
Pulsed Drain Current (Note 2)	I_{DM}	18	A
P-Channel MOSFET			
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Volltage	V_{GS}	±20	V
Continuous Drain Current (Note 1)	I_D	-3.5	A
Pulsed Drain Current (Note 2)	I_{DM}	-14	A

Notes: 1.Surface Mounted on FR4 Board Using the Minimum Recommended Pad Size.
2. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.

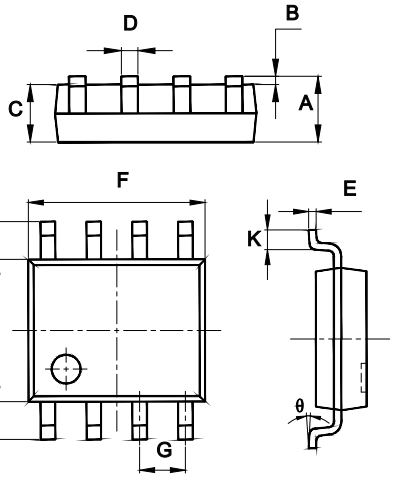
Internal Structure:





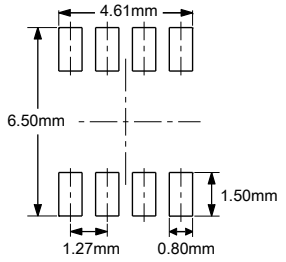
Marking:Q4559

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



N-Channel MOSFET Electrical Characteristics @ 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=250μA	60			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Threshold Voltage(Note 2)	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	2.1	3	V
Drain-Source On-Resistance(Note 2)	$R_{DS(on)}$	V_{GS}=10V, I_D=4.3A		40	58	mΩ
		V_{GS}=4.5V, I_D=3.9A		55	72	
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1.7A			1.2	V
Forward Tranconductance(Note2)	g_{FS}	V_{DS}=15V, I_D=4.3A		15		S
Dynamic Characteristics(Note 4)						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHz		665		pF
Output Capacitance	C_{oss}			75		
Reverse Transfer Capacitance	C_{rss}			40		
Gate Resistance	R_g	f=1MHz			3	Ω
Swithing Characteristics(Note 3,4)						
Total Gate Charge	Q_g	V_{DD}=30V,V_{GS}=4.5V,I_D=4.3A			9	nC
Gate-Source Charge	Q_{gs}			2.3		
Gate-Drain Charge	Q_{gd}			2.6		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} =30V, V_{GEN}=4.5V, I_D=3.4A R_L=8.8Ω, R_G=1Ω			25	ns
Turn-On Rise Time	t_r				100	
Turn-Off Delay Time	$t_{d(off)}$				25	
Turn-Off Fall Time	t_f				15	

P-Channel Electrical Characteristics @ 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=-250μA	-60			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	μA
Gate-Threshold Voltage(Note 2)	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1	-2.8	-3	V
Drain-Source On-Resistance(Note 2)	$R_{DS(on)}$	V_{GS}=-10V, I_D=-3.1A		60	80	mΩ
		V_{GS}=-4.5V, I_D=-0.2A		92	100	
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-2A			1.2	V
Forward Tranconductance(Note2)	g_{FS}	V_{DS}=-15V, I_D=-3.1A		8.5		S
Dynamic Characteristics(Note 3)						
Input Capacitance	C_{iss}	V_{DS}=-15V,V_{GS}=0V,f=1MHz		650		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			60		
Gate Resistance	R_g	f=1MHz			20	Ω
Swithing Characteristics(Note 3,4)						
Total Gate Charge	Q_g	V_{DD}=-30V,V_{GS}=-4.5V,I_D=-3.1A			12	nC
Gate-Source Charge	Q_{gs}			2.2		
Gate-Drain Charge	Q_{gd}			3.7		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} =-30V, V_{GEN}=-4.5V, I_D=-2.4A R_L=12.5Ω, R_G=1Ω			45	ns
Turn-On Rise Time	t_r				105	
Turn-Off Delay Time	$t_{d(off)}$				60	
Turn-Off Fall Time	t_f				45	

Note 3. Switching Characteristics are Independent of Operating Junction Temperature.

4. Guaranteed by Design, Not Subject to Production Testing.

N-Channel MOSFET Curve Characteristics

Fig. 1 - Output Characteristics

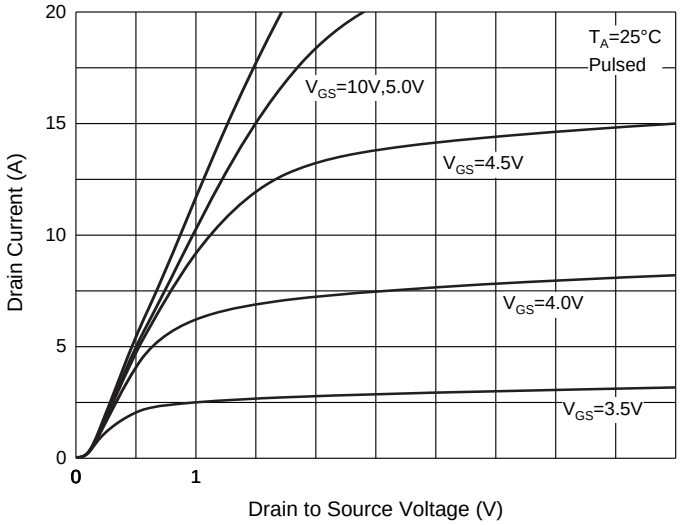


Fig. 2 - Transfer Characteristics

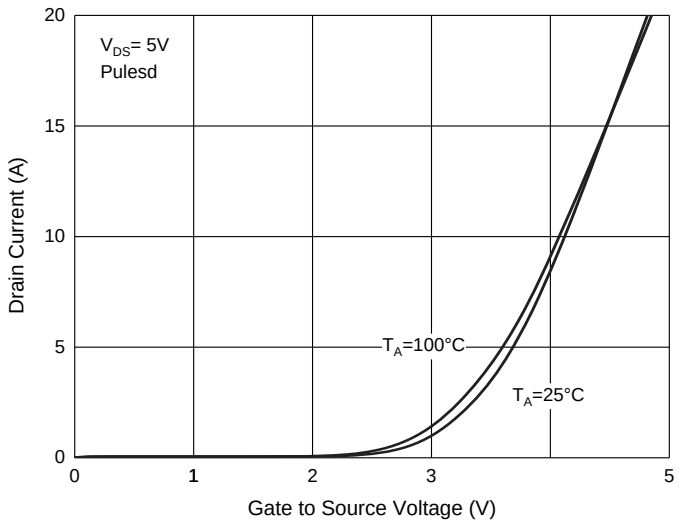


Fig. 3 - $R_{DS(ON)}$—I_D

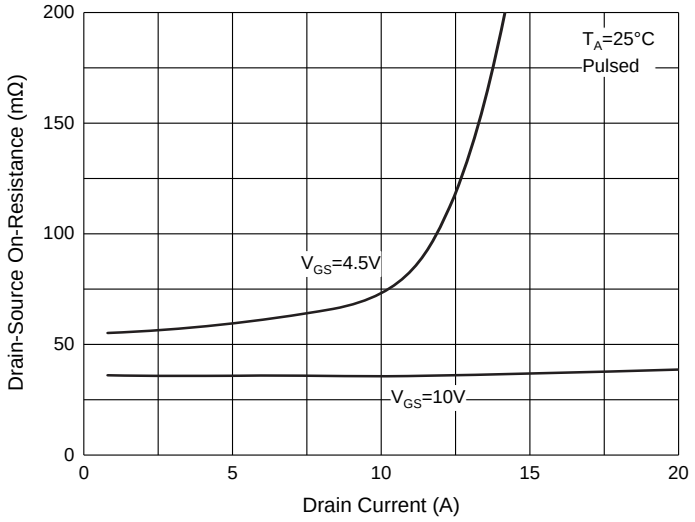


Fig. 4 - $R_{DS(ON)}$—V_{GS}

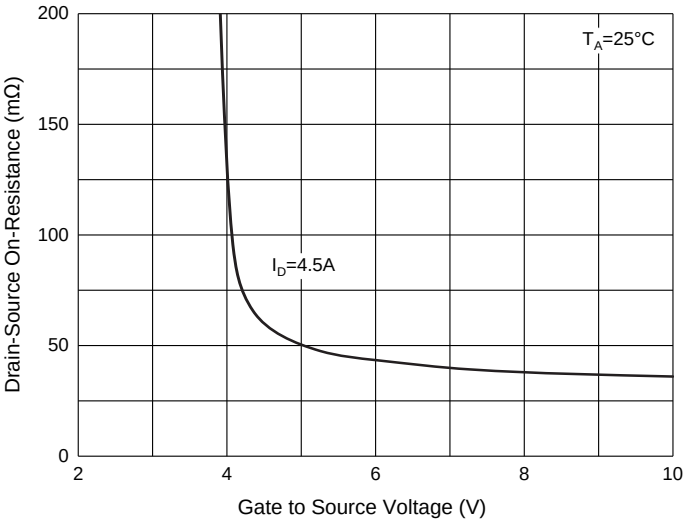


Fig. 5 - I_S—V_{SD}

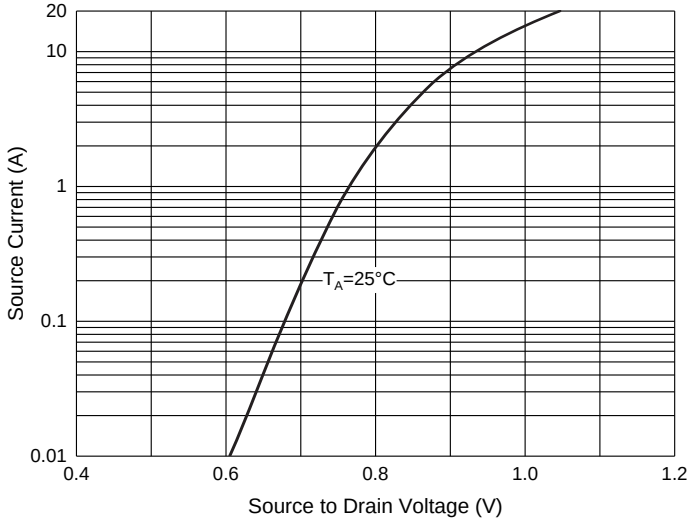
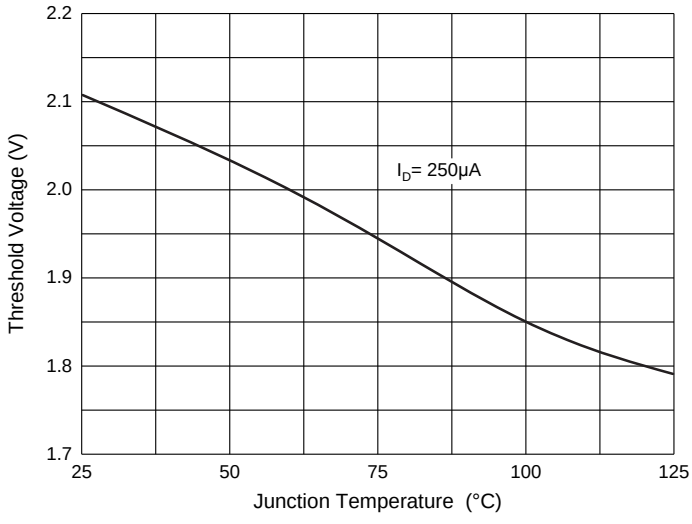


Fig. 6 - Threshold Voltage



P-Channel MOSFET Curve Characteristics

Fig. 1 - Output Characteristics

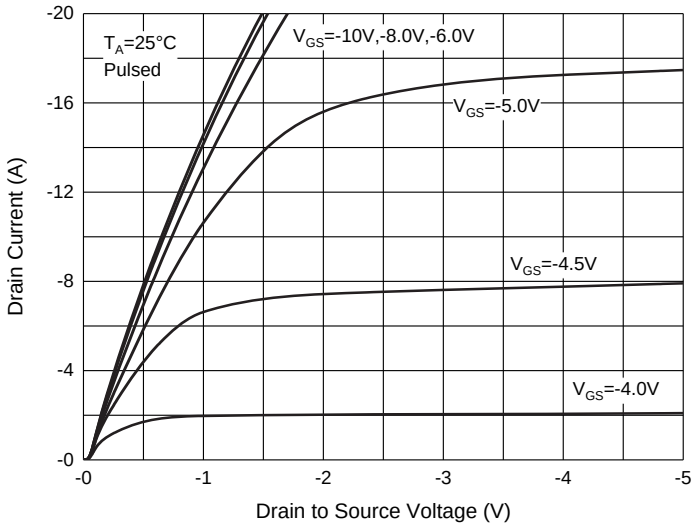


Fig. 2 - Transfer Characteristics

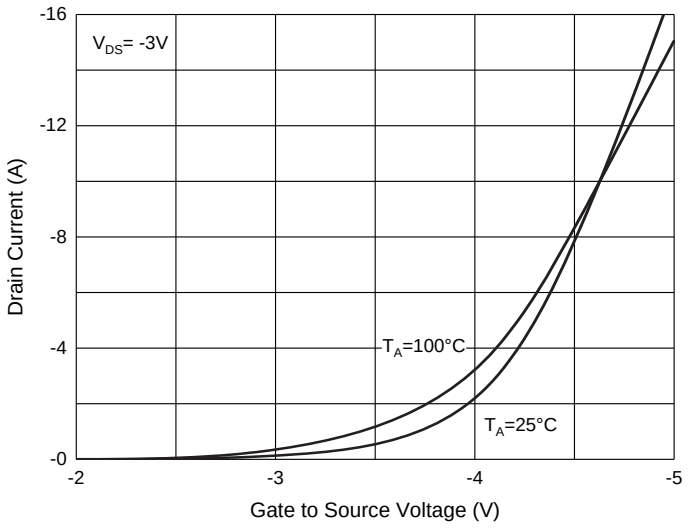


Fig. 3 - $R_{DS(ON)}$—I_D

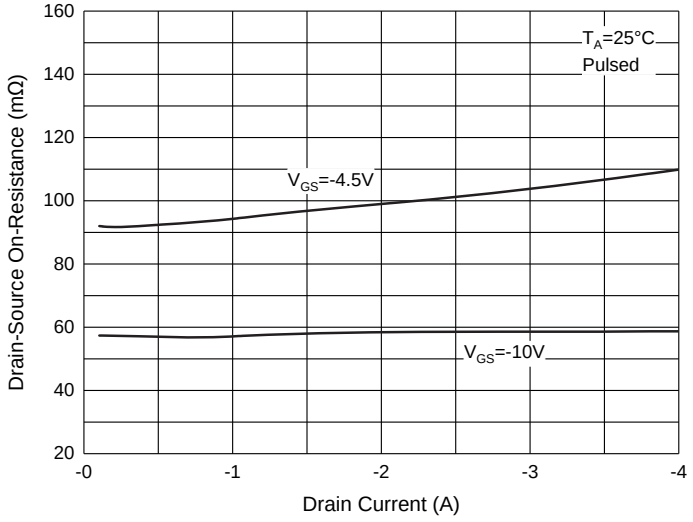


Fig. 4 - $R_{DS(ON)}$—V_{GS}

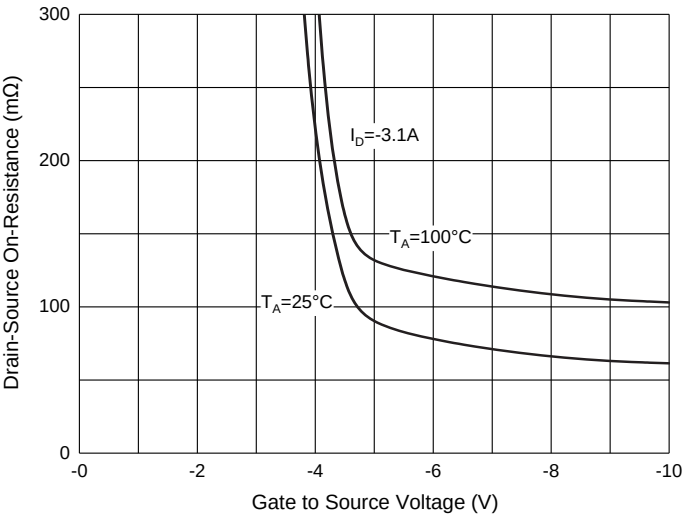


Fig. 5 - I_S—V_{SD}

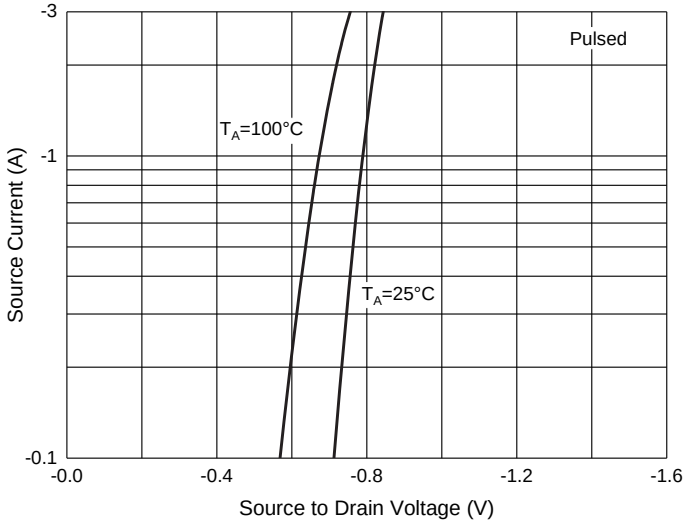
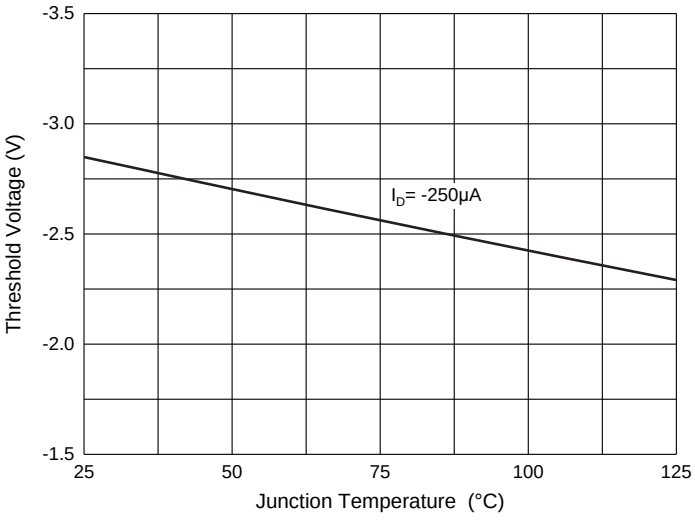


Fig. 6 - Threshold Voltage



Ordering Information

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

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF