

**Features**

- Advanced Trench MOSFET Process Technology
- 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)

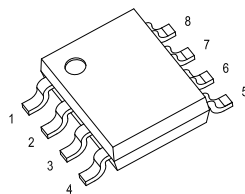
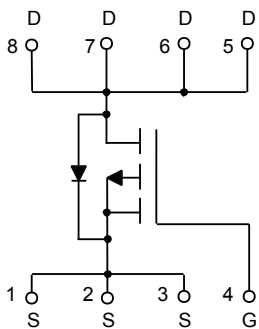
**Maximum Ratings**

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 89°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain -Source Voltage	$V_{DS}$	-30	V
Gate -Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous	$I_D$	-9.1	A
Drain Current-Pulsed	$I_{DM}$	-36	A
Power Dissipation	$P_D$	1.4	W
Single Pulsed Avalanche Energy (Note1)	$E_{AS}$	20	mJ

Note:  
1.EAS condition:  $V_{DD}=-50V, L=0.5mH, R_G=25\Omega$ , Starting  $T_J = 25^\circ C$

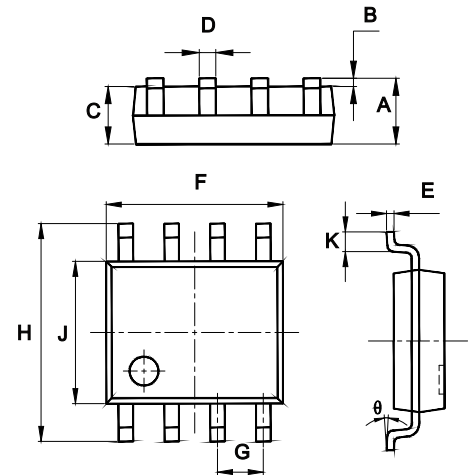
**Internal Structure**



Marking:Q4435

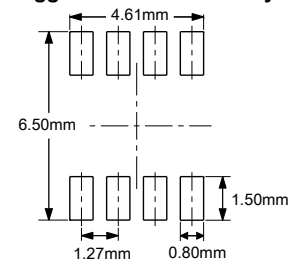
**P-Channel Power MOSFET**

**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	
$\theta$	0°	8°	0°	8°	

**Suggested Solder Pad Layout**



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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate-Threshold Voltage <sup>(Note1)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.5	-3.0	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$			-1	$\mu A$
Drain-Source On-Resistance <sup>(Note1)</sup>	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-9.1A$		14	24	m $\Omega$
		$V_{GS}=-4.5V, I_D=-6.9A$		23	35	
Forward Transconductance <sup>(Note1)</sup>	$g_{FS}$	$V_{DS}=-10V, I_D=-9.1A$	20			S
<b>Dynamic Characteristics<sup>(Note2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		1350		pF
Output Capacitance	$C_{oss}$			215		
Reverse Transfer Capacitance	$C_{rss}$			185		
<b>Switching Characteristics<sup>(Note2)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-1.0A, V_{GS}=-10V, R_{GEN}=1\Omega, R_L=15\Omega$			15	nS
Turn-On Rise Time	$t_r$				15	
Turn-Off Delay Time	$t_{d(off)}$				70	
Turn-Off Fall Time	$t_f$				25	
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		5.8		$\Omega$
Total Gate Charge	$Q_g$	$V_{DS}=-15V, I_D=-9.1A, V_{GS}=-10V$			50	nC
		$V_{DS}=-15V, I_D=-9.1A, V_{GS}=-4.5V$			25	
Gate-Source Charge	$Q_{gs}$	$V_{DS}=-15V, I_D=-9.1A, V_{GS}=-4.5V$		4.0		
Gate-Drain Charge	$Q_{gd}$	$V_{DS}=-15V, I_D=-9.1A, V_{GS}=-4.5V$		7.5		
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>(Note1)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=-2A$			-1.2	V
Continuous Drain-Source Diode Forward Current	$I_S$				-9.1	A
Pulsed Drain-Source Diode Forward Current	$I_{SM}$				-36	A

Note:

- 1.Pulse Test : Pulse Width $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 2.Guaranteed by design, not subject to production testing.

## Curve Characteristics

Fig. 1 - Output Characteristics

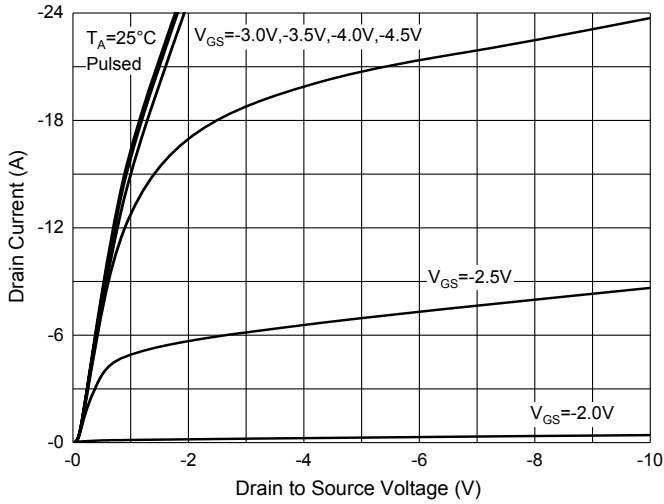


Fig. 2 - Transfer Characteristics

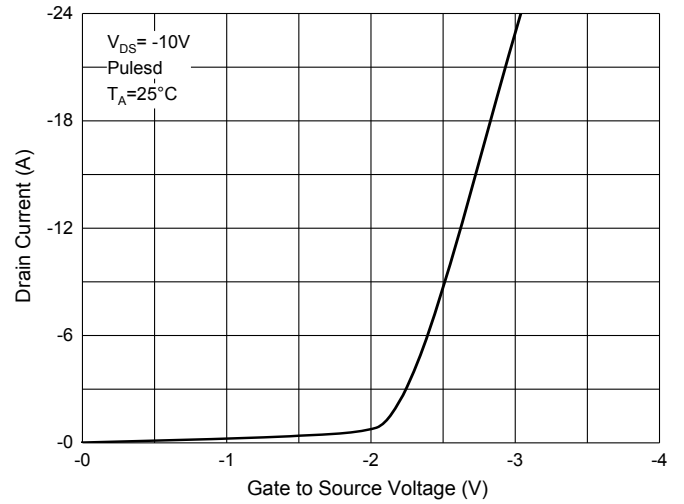


Fig. 3 -  $R_{DS(ON)} - I_D$

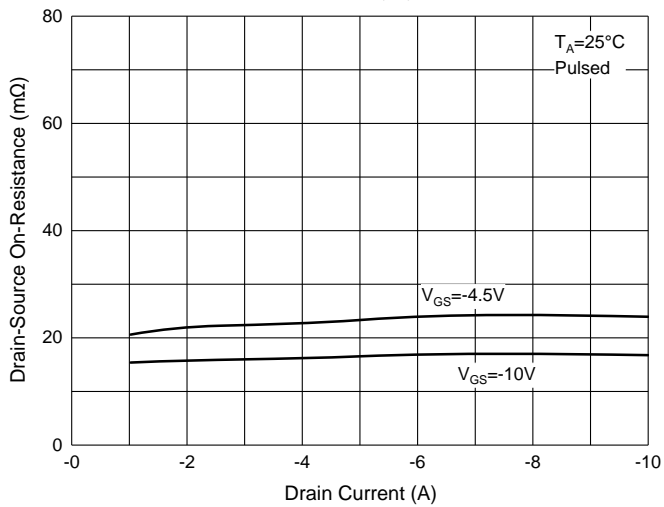


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

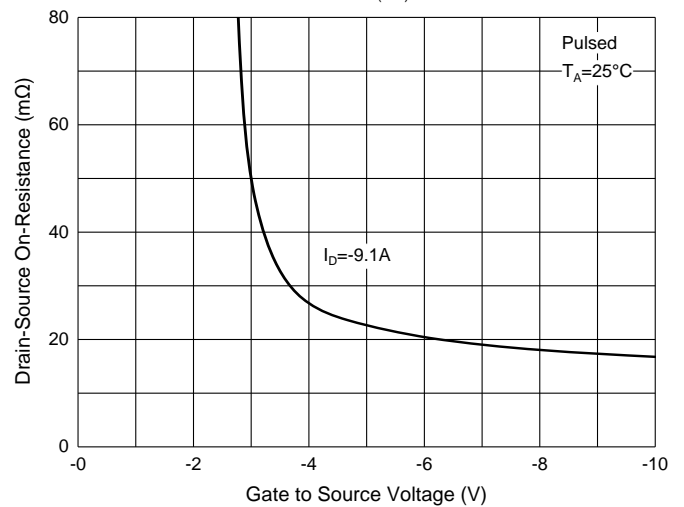


Fig. 5 - Threshold Voltage

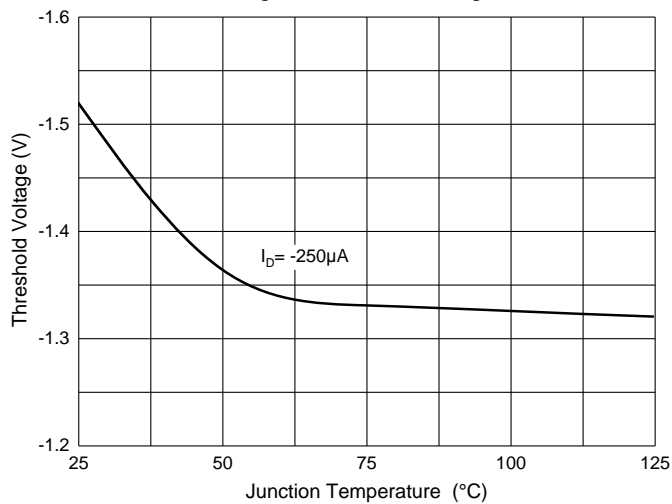
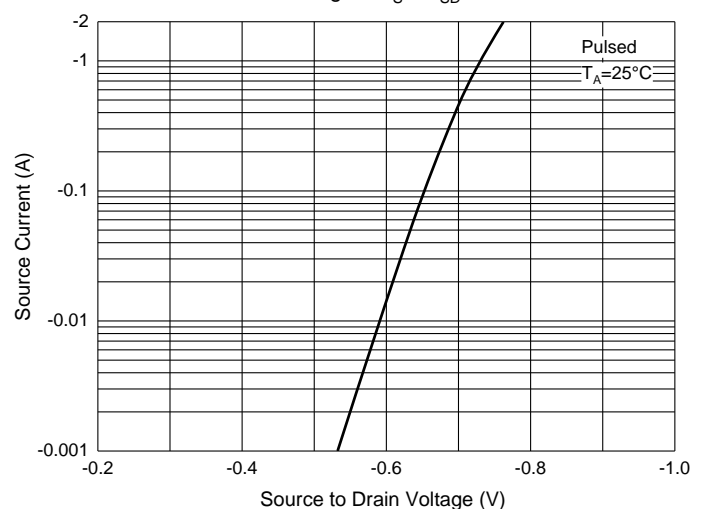


Fig. 6 -  $I_S - V_{SD}$



## 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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