

**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**

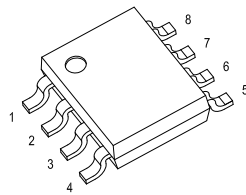
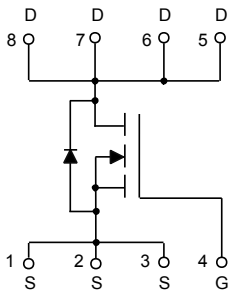
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 89°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain -Source Voltage	$V_{DS}$	30	V
Gate -Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous	$I_D$	7.5	A
Single Pulsed Avalanche Energy <sup>(Note1)</sup>	$E_{AS}$	72	mJ
Pulsed Drain Current	$I_{DM}$	50	A
Power Dissipation	$P_D$	1.4	W

**Notes :**

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

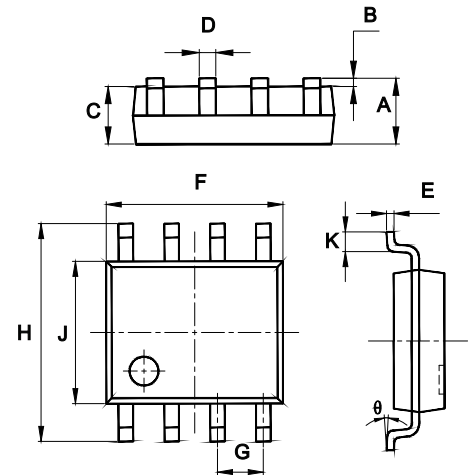
**Internal Structure**



**Marking:** Q4410

# N-Channel Enhancement Mode Field Effect Transistor

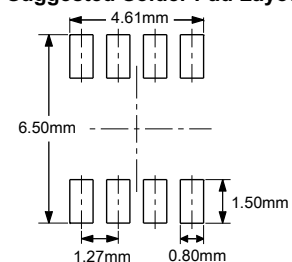
**SOP-8**



**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 (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	1.3	3.0	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Drain-Source On-Resistance <sup>(Note1)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		9.0	13.5	m $\Omega$
		$V_{GS}=4.5V, I_D=5.0A$		12	20	
Forward Transconductance <sup>(Note1)</sup>	$g_{FS}$	$V_{DS}=15V, I_D=5.0A$		8.0		S
<b>Dynamic Characteristics<sup>(Note2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		9130		pF
Output Capacitance	$C_{oss}$			625		
Reverse Transfer Capacitance	$C_{rss}$			387		
<b>Switching Characteristics<sup>(Note2)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=25V, V_{GS}=10V, I_D=1A, R_{GEN}=6\Omega, R_L=25\Omega$			15	ns
Turn-On Rise Time	$t_r$				15	
Turn-Off Delay Time	$t_{d(off)}$				60	
Turn-Off Fall Time	$t_f$				25	
Total Gate Charge	$Q_g$	$V_{DS}=15V, I_D=10A, V_{GS}=10V$			40	nC
Gate-Source Charge	$Q_{gs}$			5.5		
Gate-Drain Charge	$Q_{gd}$			3.7		
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(Note1)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=2.3A$			1.1	V
Drain-Source Diode Forward Current	$I_S$				7.5	A
Pulsed drain-source diode forward current	$I_{SM}$				50	A

Notes:

- 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

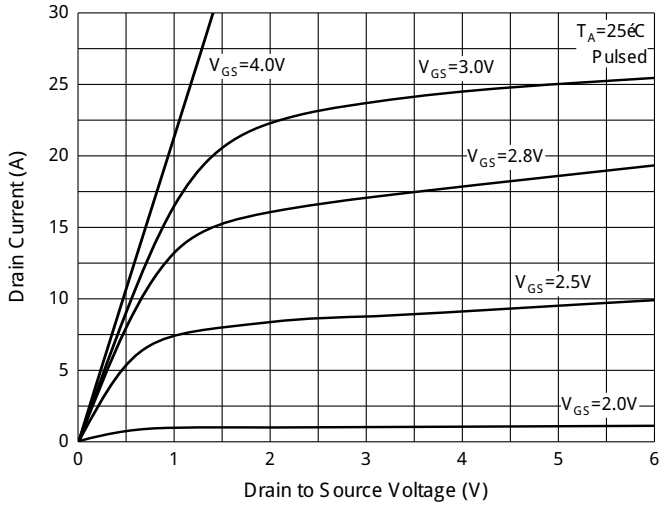


Fig. 2 - Transfer Characteristics

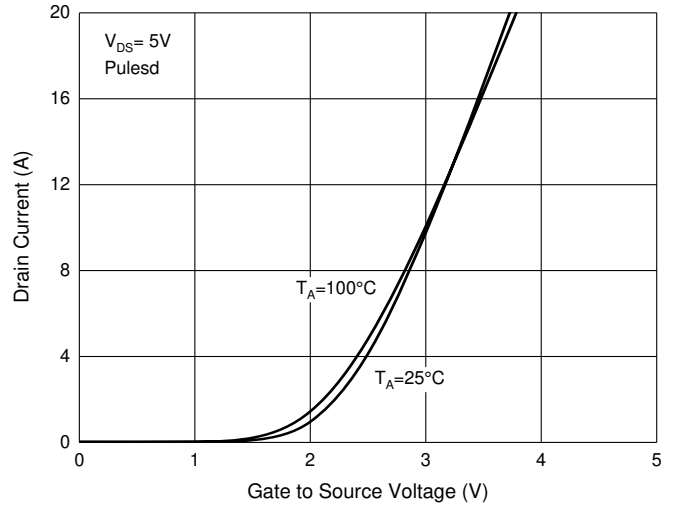


Fig. 3 -  $R_{DS(ON)} - I_D$

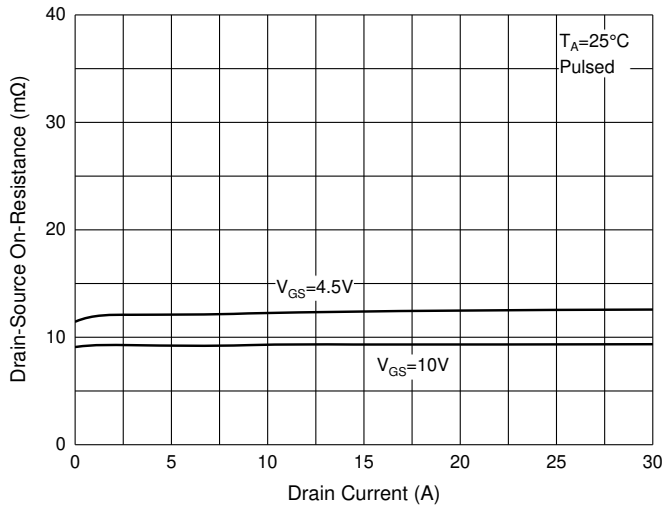


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

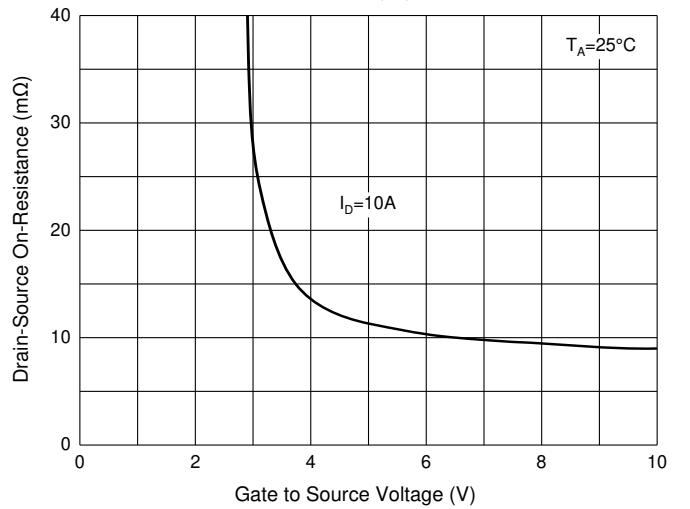


Fig. 5 - Threshold Voltage

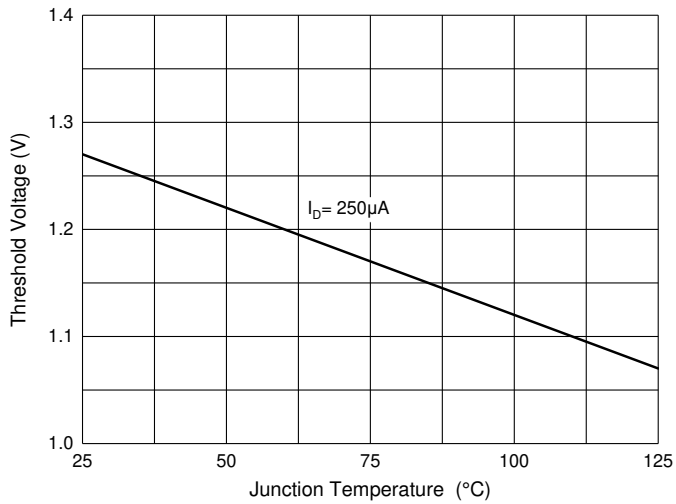
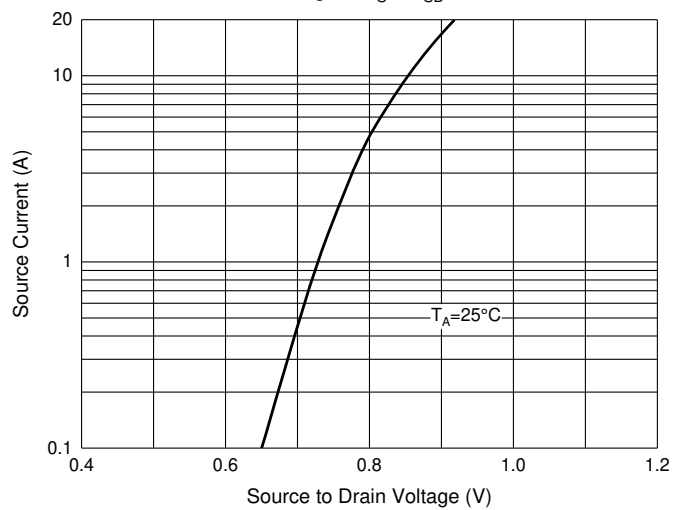


Fig. 6 -  $I_S - V_{SD}$



## 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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