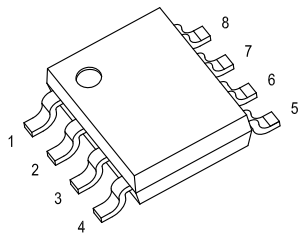
SOP8 Plastic-Encapsulate N- MOSFETS

APPLICATION

- Load Switch
- PWM applications

$V_{(BR)DSS}$	$R_{DS(on)}$TYP	I_D
60 V	18mΩ@10V	8.2A
	25mΩ@4.5V	

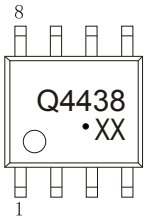
SOP8



FEATURE

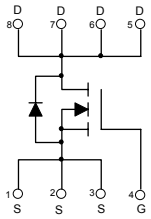
- TrenchFET Power MOSFET
- Low R_{DS}(on)
- Low Gate Charge
- ROHS Compliant
- AEC-Q101 qualified (Automotive grade with suffix " Q".)
- Expsemi electronics

MARKING



Q4438 = Device code.
Solid dot = Green molding compound device, if none, the normal device.
XX = Code.

Equivalent Circuit



MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D ①	8.2	A
Pulsed Drain Current	I_{DM} ②	40	A
Power Dissipation	P_D ⑤	2.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑤	50	℃/W
Operating Junction and Storage Temperature Range	T_J ,T_{stg}	-55~+150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =48V, V_{GS} =0V, T_J =25℃			1.0	μA
		V_{DS} =48V, V_{GS} =0V, T_J =125℃			100	
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
On characteristics ③						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.8	3.0	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =8.2A		18	22	mΩ
		V_{GS} =4.5V, I_D =7.6A		25	36	mΩ
Forward transconductance	g_{FS}	V_{DS} =5V, I_D =8.2A				S
Dynamic characteristics ③④						
Input capacitance	C_{iss}	V_{DS} =30V,V_{GS} =0V, f =1MHz		820	1640	pF
Output capacitance	C_{oss}			93	186	
Reverse transfer capacitance	C_{rss}			69	138	
Gate resistance	R_g	f =1MHz		3.8		Ω
Switching characteristics ③④						
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=30V, I_D=6A		21	42	nC
Gate-source charge	Q_{gs}			2.0	4.0	
Gate-drain charge	Q_{gd}			6.6	13	
Turn-on delay time	$t_{d(on)}$	V_{DS}=30V,R_L=3.6Ω, V_{GS}=10V,R_G=3Ω		8.2		ns
Turn-on rise time	t_r			5.5		
Turn-off delay time	$t_{d(off)}$			30		
Turn-off fall time	t_f			5.2		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ③	V_{GS} =0V, I_S=1A			1.0	V
Continuous drain-source diode forward current	I_S ①				8.2	A
Pulsed drain-source diode forward current	I_{SM} ②				40	A

Notes:

1.T_C=25℃ Limited only by maximum temperature allowed.

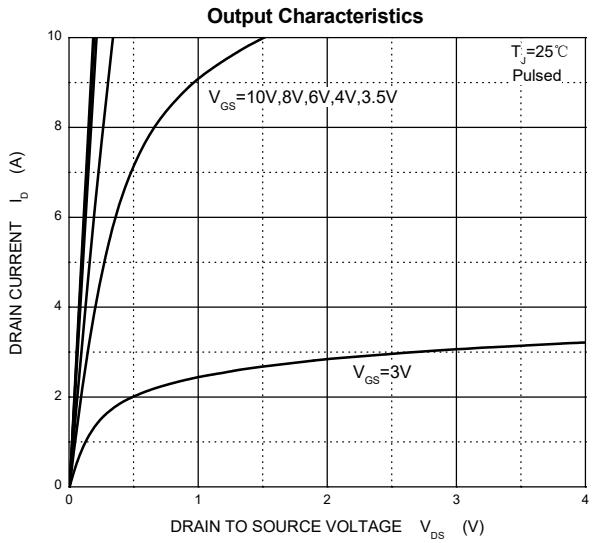
2.P_W≤10μs, Duty cycle≤1%.

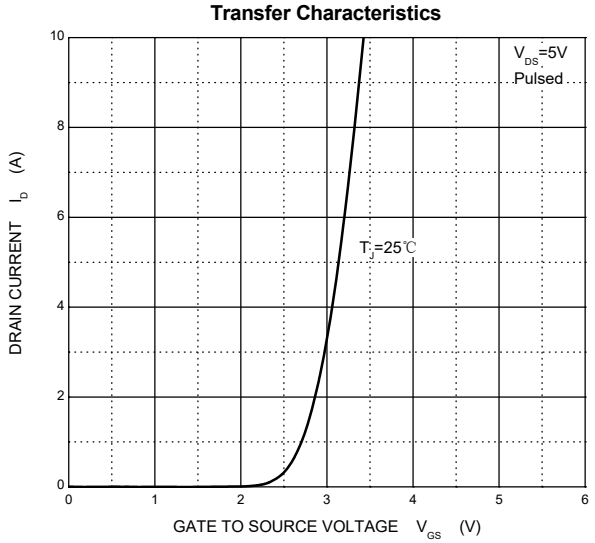
3.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

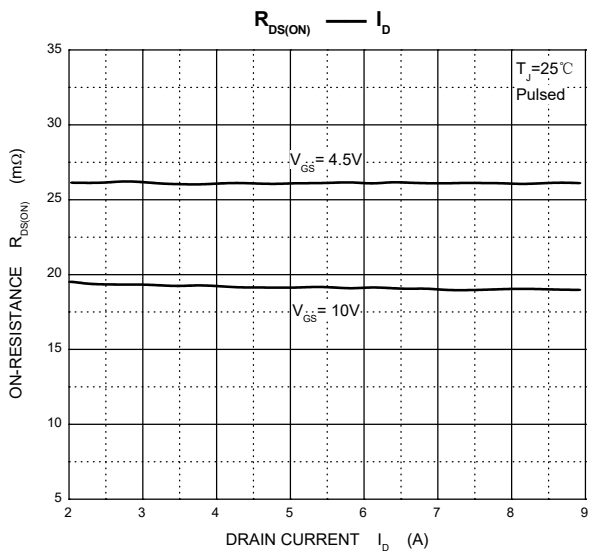
4.Guaranteed by design, not subject to production.

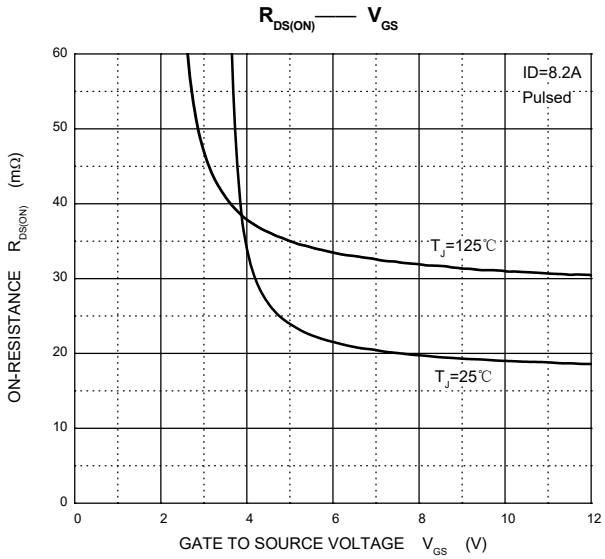
5.The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25℃,t ≤10sec.

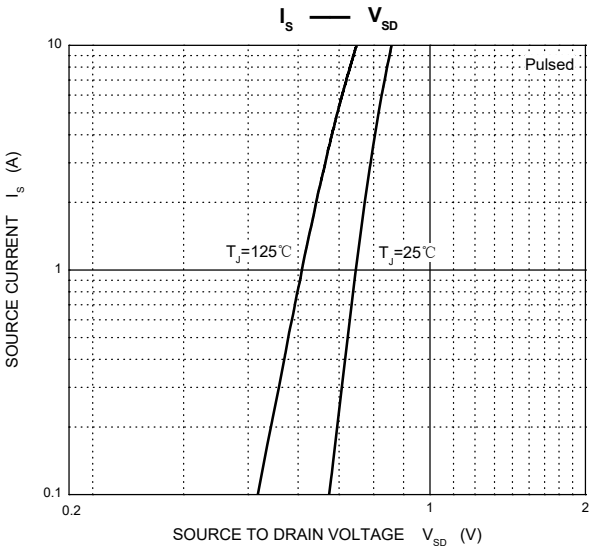
Typical Characteristics

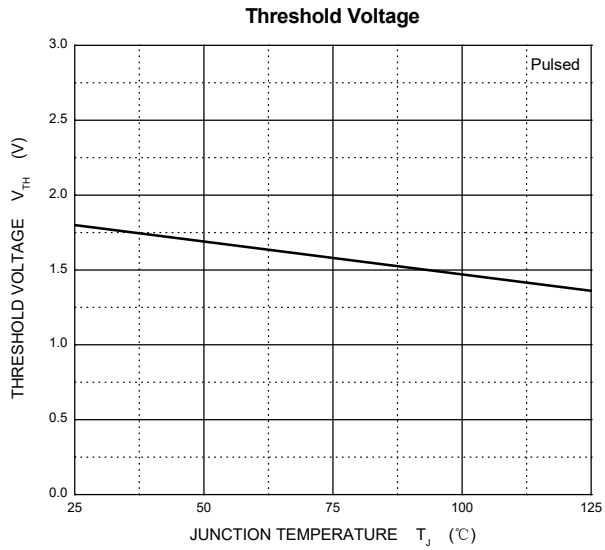












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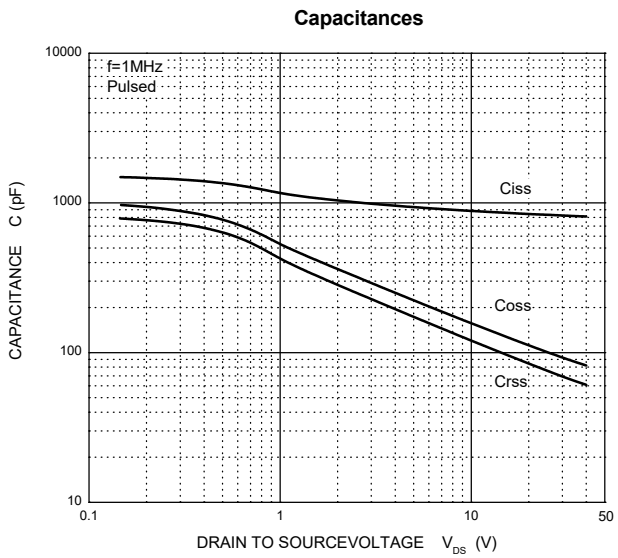
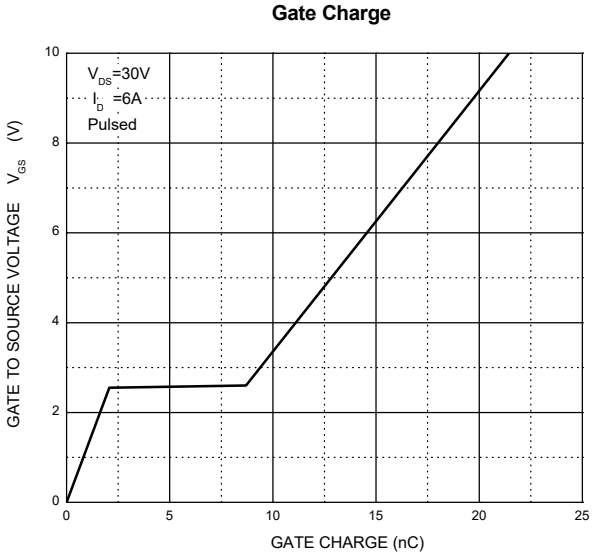
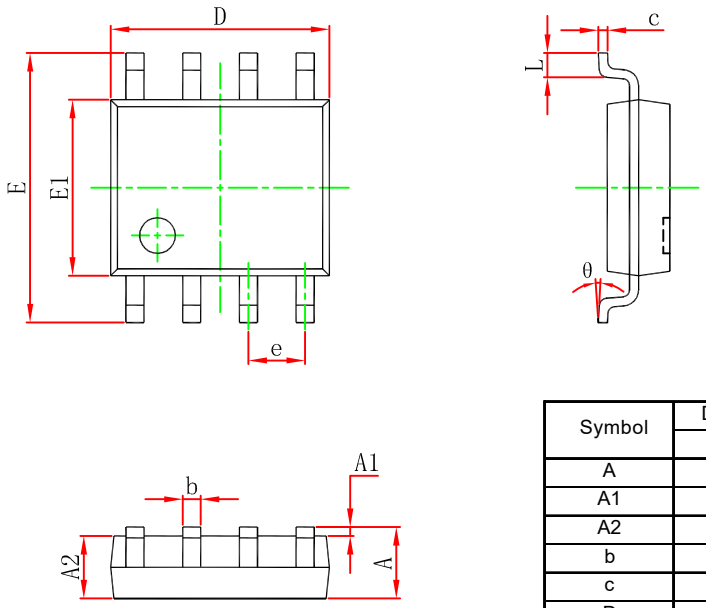


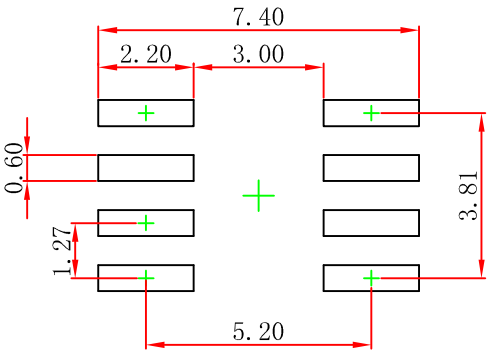


SOP8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
A	1.450	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
e	1.270（BSC）		0.050（BSC）	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

SOP8 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.