



Micro Commercial Components



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**MCQ4438**

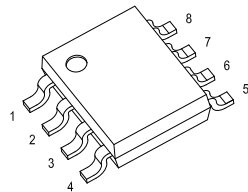
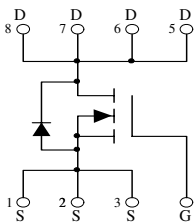
## Features

- TrenchFET Power MOSFET
- Halogen free available upon request by adding suffix "-HF"
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:Q4438

## Maximum Ratings @ 25°C Unless Otherwise Specified

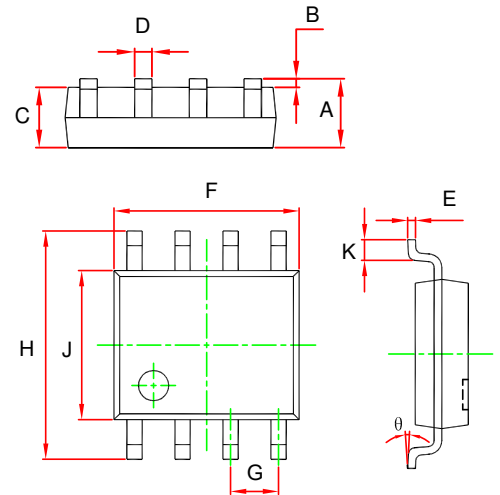
Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	60	V
$I_D$	Drain Current-Continuous(note1)	8.2	A
$I_{DM}$	Pulsed Drain Current(note2)	40	A
$V_{GS}$	Gate-source Voltage	$\pm 20$	V
$P_D$	Power Dissipation	1.25	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient(note1)	100	$^{\circ}C/W$
$T_J$	Operating Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$

## Equivalent Circuit



## N-Channel Power MOSFET

## SOP-8



DIM	DIMENSIONS				NOTE
	INCHES		MM		
A	0.053	0.069	1.350	1.750	
B	0.004	0.010	0.100	0.250	
C	0.053	0.061	1.350	1.550	
D	0.013	0.020	0.330	0.510	
E	0.007	0.010	0.170	0.250	
F	0.189	0.197	4.800	5.000	
G	0.050 (BSC)		1.270 (BSC)		
H	0.228	0.244	5.800	6.200	
J	0.150	0.157	3.800	4.000	
K	0.016	0.050	0.400	1.270	
$\theta$	0 $^{\circ}$	8 $^{\circ}$	0 $^{\circ}$	8 $^{\circ}$	

**ELECTRICAL CHARACTERISTICS( $T_a=25^\circ\text{C}$  unless otherwise specified)**

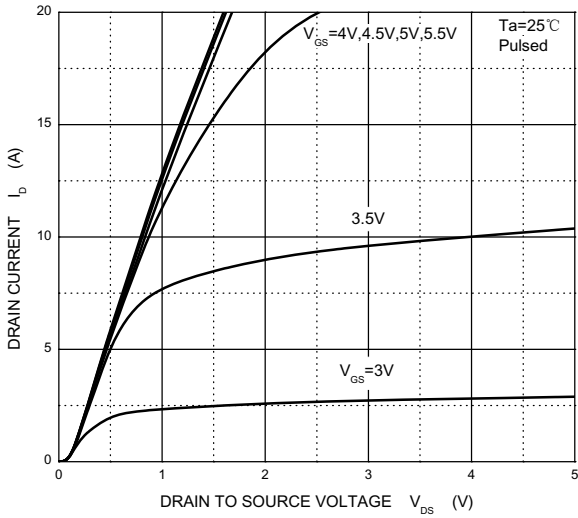
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1		3	V
Drain-source on-resistance (note 3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 8.2A$			22	m $\Omega$
		$V_{GS} = 4.5V, I_D = 7.6A$			36	m $\Omega$
Forward transconductance (note 3)	$g_{fs}$	$V_{DS} = 5V, I_D = 8.2A$	10			S
Diode forward voltage (note 3)	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$			1	V
<b>DYNAMIC PARAMETERS (note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$			2300	pF
Output Capacitance	$C_{oss}$			155		pF
Reverse Transfer Capacitance	$C_{rss}$			116		pF
<b>SWITCHING PARAMETERS (note 4)</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 30V$ $R_L = 3.6\Omega, R_{GEN} = 3\Omega$		8.2		ns
Turn-on rise time	$t_r$			5.5		ns
Turn-off delay time	$t_{d(off)}$			29.7		ns
Turn-off fall time	$t_f$			5.2		ns
Total Gate Charge (10V)	$Q_g$	$V_{DS} = 30V, V_{GS} = 10V, I_D = 8.2A$			58	nC
Total Gate Charge (4.5V)					30	nC
Gate-Source Charge	$Q_{gs}$			6		nC
Gate-Drain Charge	$Q_{gd}$			14.4		nC

**Notes :**

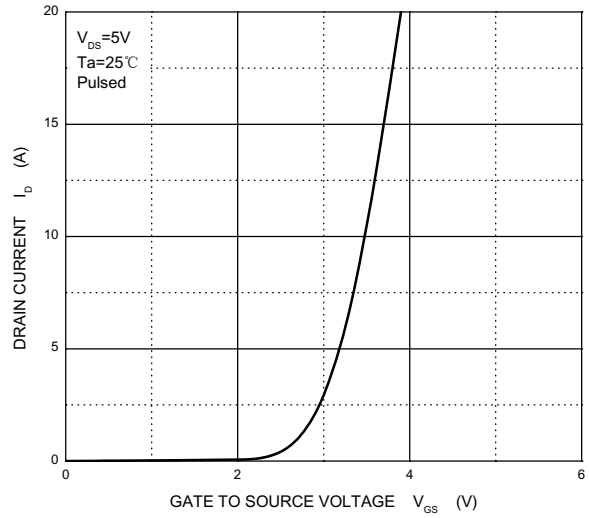
1. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR4 board with 2oz. Copper, in a still air environment with  $T_a=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10s$  thermal resistance rating.
2. Repetitive rating : Pulse width limited by junction temperature.
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. These parameters have no way to verify.

Typical Characteristics

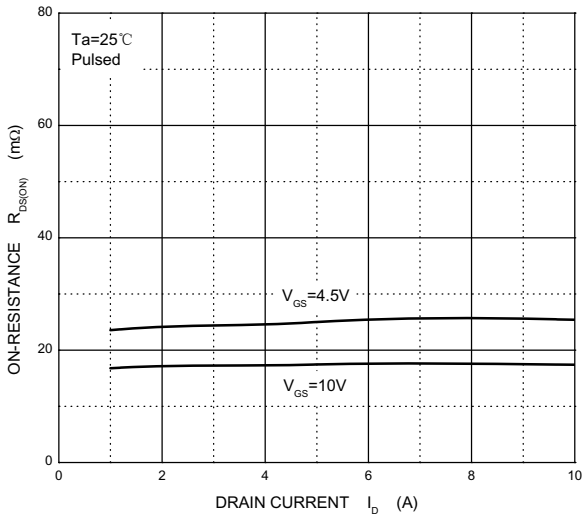
Output Characteristics



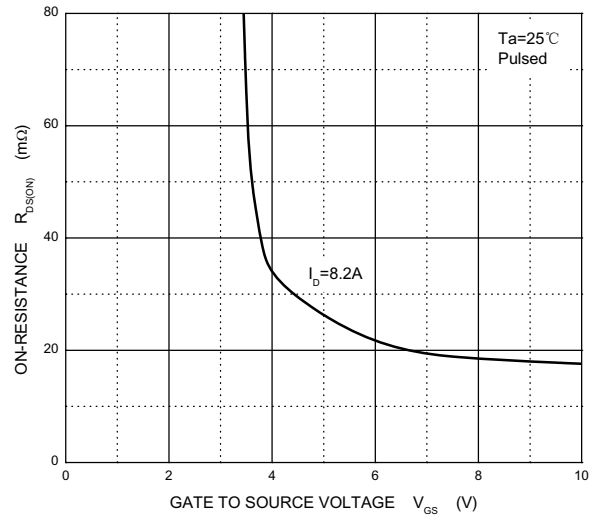
Transfer Characteristics



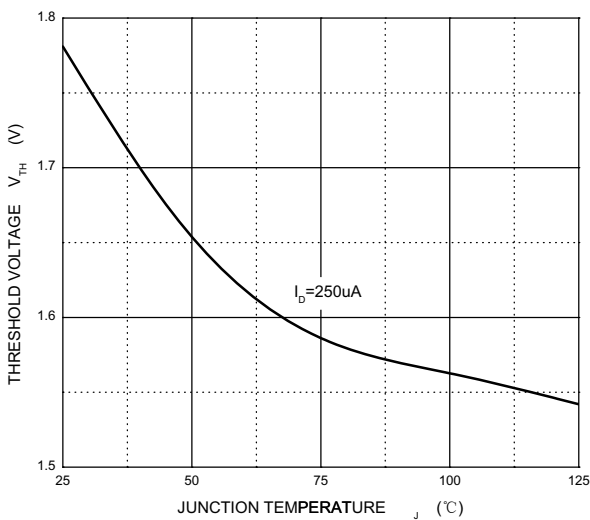
$R_{DS(ON)}$  —  $I_D$



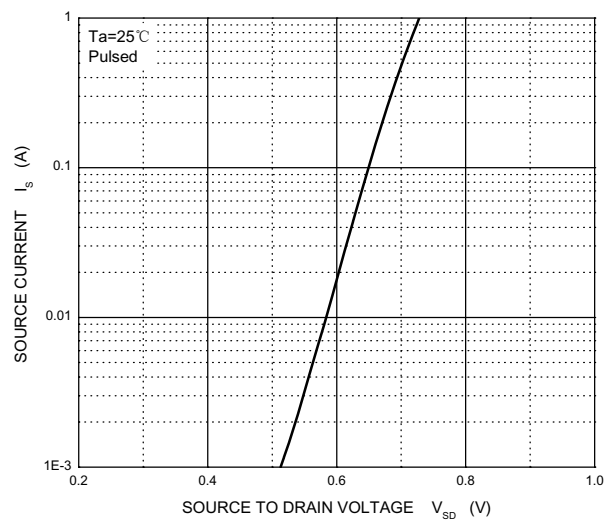
$R_{DS(ON)}$  —  $V_{GS}$



Threshold Voltage



$I_S$  —  $V_{SD}$





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## 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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