



Micro Commercial Components

Micro Commercial Components  
20736 Marilla Street Chatsworth  
CA 91311  
Phone: (818) 701-4933  
Fax: (818) 701-4939

# MCQ4503

## Features

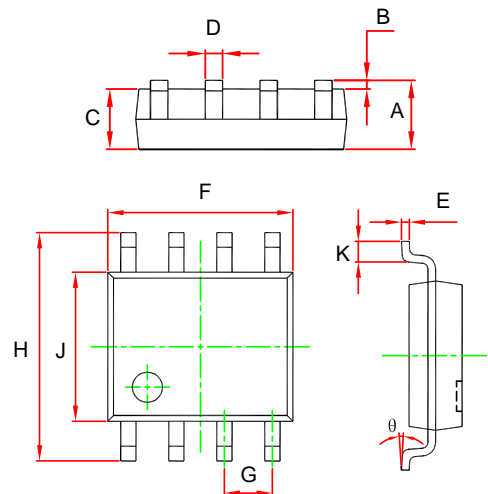
- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/Rohs Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking: Q4503

## N and P-Channel Enhancement Mode Field Effect Transistor

### Maximum ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	$V_{DS}$	30	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	V
Continuous Drain Current <sup>a</sup>	$I_D$	6.9	-6.3	A
$T_a=25^{\circ}\text{C}$ $T_a=70^{\circ}\text{C}$		5.5	-5	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	20	-20	A
Power Dissipation	$P_D$	1.4		W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	89		$^{\circ}\text{C/W}$
Operating Junction Temperature	$T_J$	150		$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150		

## SOP-8

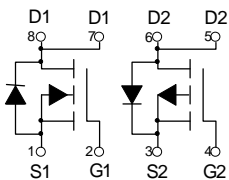


DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.350	1.750	
B	0.004	0.010	0.100	0.250	
C	0.053	0.061	1.350	1.550	
D	0.013	0.020	0.330	0.510	
E	0.007	0.010	0.170	0.250	
F	0.189	0.197	4.800	5.000	
G	0.050 (BSC)		1.270 (BSC)		
H	0.228	0.244	5.800	6.200	
J	0.150	0.157	3.800	4.000	
K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

### Notes :

- These tests are performed with infinite heat sink.
- Pulse width by Max.junction temperature.

### Equivalent Circuit



Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

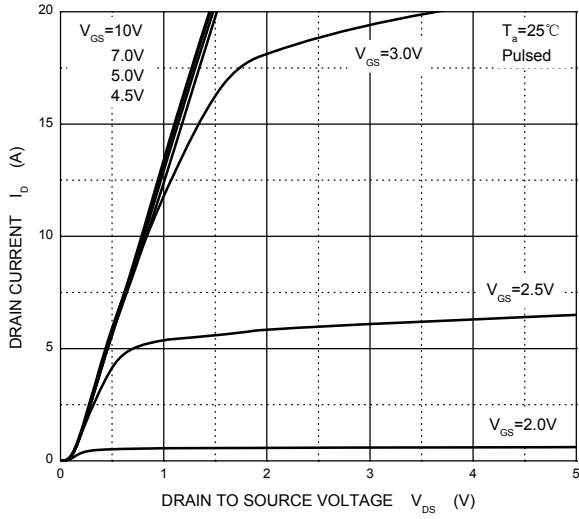
Parameter	Symbol	Test Condition	Min	Typ	Max	Units	
<b>Static</b>							
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0, I <sub>D</sub> =250μA	N-Ch	30		V	
		V <sub>GS</sub> =0, I <sub>D</sub> =-250μA	P-Ch	-30			
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	N-Ch	1	1.5	3	V
		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	P-Ch	-1	-1.7	-3	
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	N-Ch			±100	nA
			P-Ch				
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	N-Ch			1	μA
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	P-Ch			-1	
Drain-source on-resistance <sup>c</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A	N-Ch		10	28	mΩ
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-6A	P-Ch		16	36	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A	N-Ch		14	42	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	P-Ch		25	55	
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =6A	N-Ch	4			S
		V <sub>DS</sub> =-10V, I <sub>D</sub> =-6A	P-Ch				
Diode forward voltage <sup>c</sup>	V <sub>SD</sub>	I <sub>S</sub> =1.7A, V <sub>GS</sub> =0V	N-Ch			1.2	V
		I <sub>S</sub> =-1.7A, V <sub>GS</sub> =0V	P-Ch			-1.2	
<b>Dynamic</b>							
Total gate charge <sup>c</sup>	Q <sub>g</sub>	N-Channel	N-Ch			13.5	nC
			P-Ch			20	
Gate-source charge <sup>d</sup>	Q <sub>gs</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	N-Ch		1.4		nC
			P-Ch		2		
Gate-drain charge <sup>d</sup>	Q <sub>gd</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	N-Ch		4.7		nC
			P-Ch		7		
Turn-on delay time <sup>c</sup>	t <sub>d(on)</sub>	N-Channel	N-Ch		5		ns
			P-Ch		8		
Rise time <sup>d</sup>	t <sub>r</sub>	V <sub>DS</sub> =20V, R <sub>D</sub> =20Ω, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω	N-Ch		8		ns
			P-Ch		7		
Turn-off delay time <sup>d</sup>	t <sub>d(off)</sub>	P-Channel V <sub>DS</sub> =-15V, R <sub>D</sub> =15Ω, I <sub>D</sub> =-1A, V <sub>GS</sub> =-10V, R <sub>G</sub> =3.3Ω	N-Ch		18.5		ns
			P-Ch		34		
Fall time <sup>d</sup>	t <sub>f</sub>	P-Channel	N-Ch		9		ns
			P-Ch		26		
Input Capacitance <sup>d</sup>	C <sub>iss</sub>	N-Channel	N-Ch			770	pF
			P-Ch			1380	
Output Capacitance <sup>d</sup>	C <sub>oss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz	N-Ch		80		pF
			P-Ch		150		
Reverse Transfer Capacitance <sup>d</sup>	C <sub>rss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f =1MHz	N-Ch		75		pF
			P-Ch		140		

Notes :

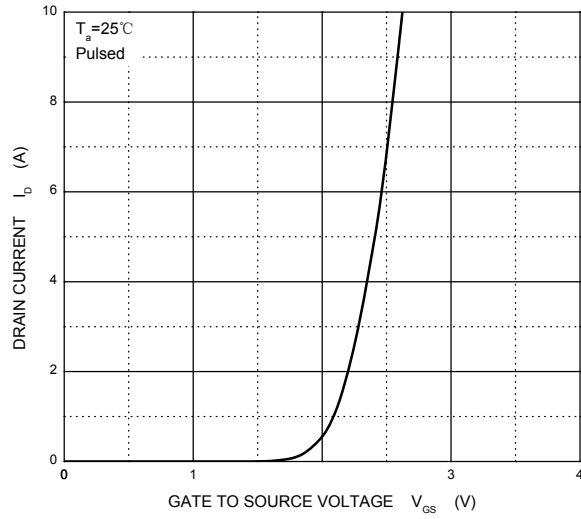
- c. Pulse Test : Pulse width≤300μs, duty cycle ≤2%.
- d. Guaranteed by design, not subject to production testing.

## Typical Characteristics

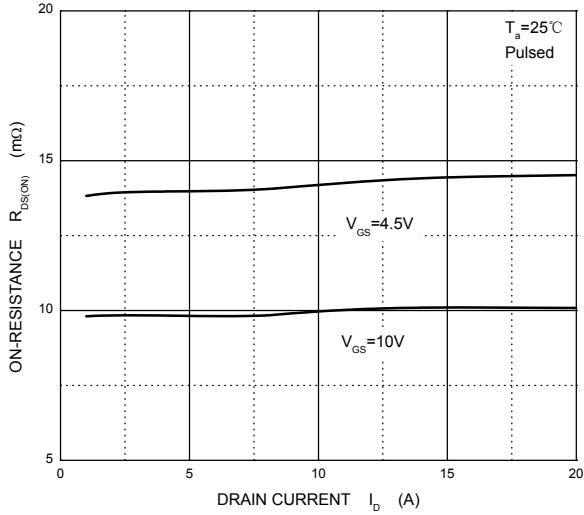
**Output Characteristics**



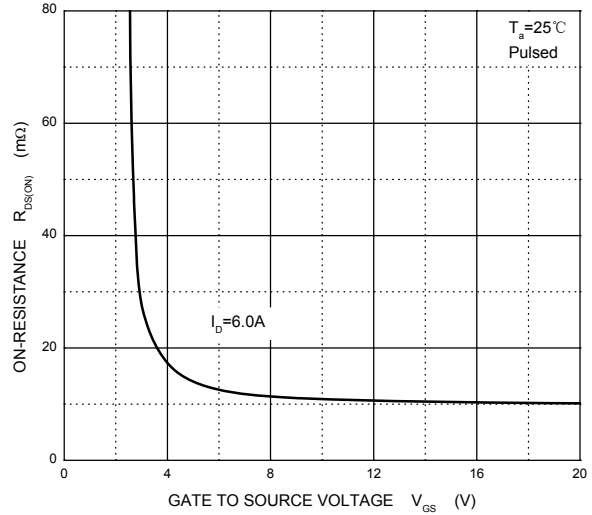
**Transfer Characteristics**



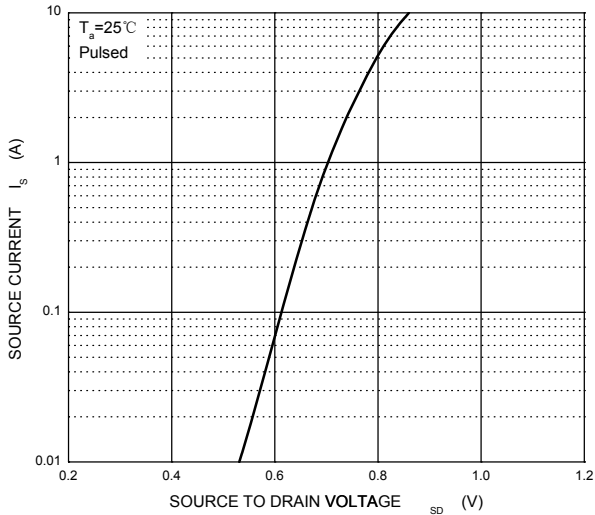
**$R_{DS(ON)}$  —  $I_D$**



**$R_{DS(ON)}$  —  $V_{GS}$**

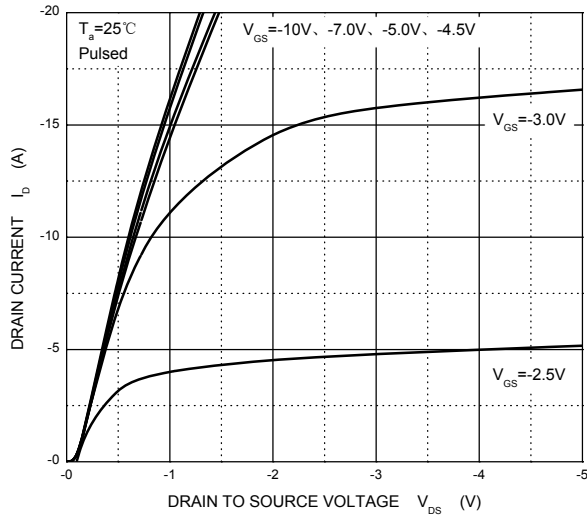


**$I_S$  —  $V_{SD}$**

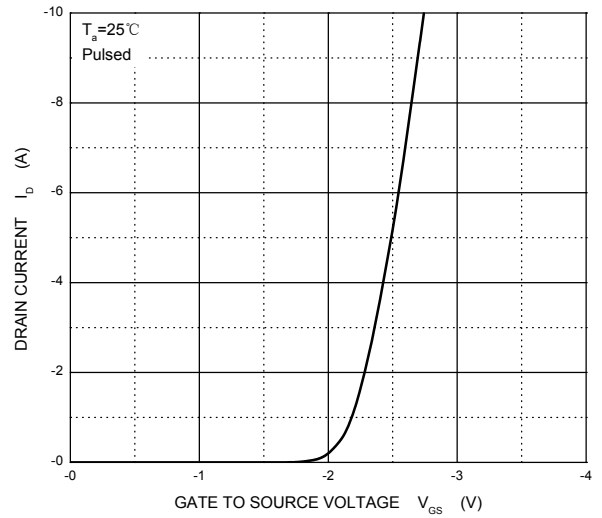


# Typical Characteristics

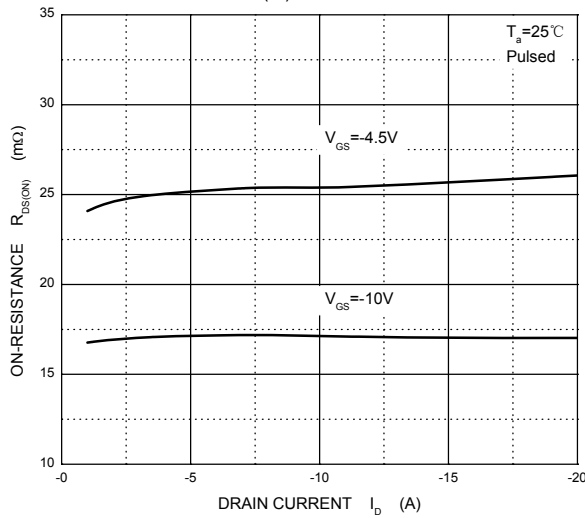
Output Characteristics



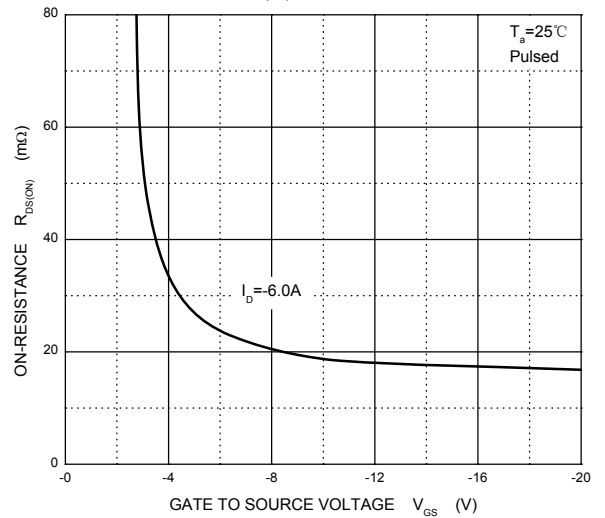
Transfer Characteristics



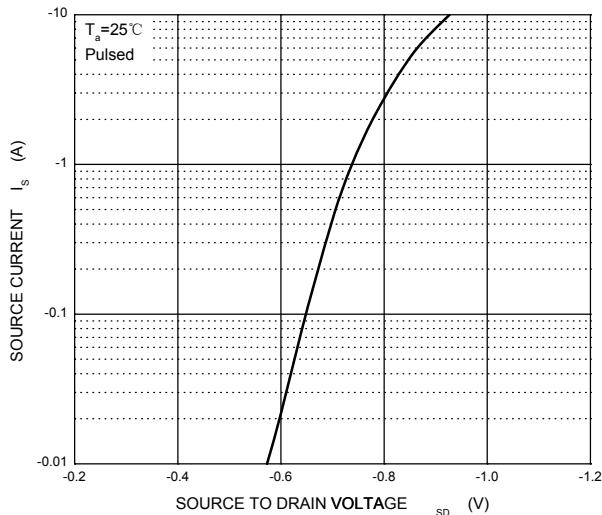
$R_{DS(ON)}$  —  $I_D$



$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$





Micro Commercial Components

Ordering Information :

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

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

\*\*\*IMPORTANT NOTICE\*\*\*

Micro Commercial Components Corp. reserves the right to make changes without further notice to any product herein to make corrections, modifications , enhancements , improvements , or other changes . Micro Commercial Components Corp . does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others . The user of products in such applications shall assume all risks of such use and will agree to hold Micro Commercial Components Corp . and all the companies whose products are represented on our website, harmless against all damages.

\*\*\*LIFE SUPPORT\*\*\*

MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation.

\*\*\*CUSTOMER AWARENESS\*\*\*

Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.