



Micro Commercial Components



Micro Commercial Components  
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# MCS8820

## Features

- Advanced trench MOSFET process technology
- Excellent  $R_{DS(ON)}$  and low gate charge
- Halogen free available upon request by adding suffix "-HF"
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking: S8820

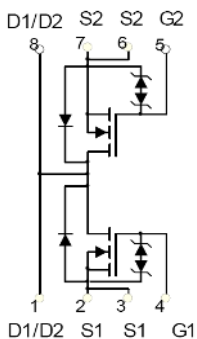
## Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	20	V
$I_D$	Drain Current-Continuous	7	A
$I_{DM}$	Pulsed Drain Current (note1)	30	A
$V_{GS}$	Gate-source Voltage	$\pm 12$	V
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	125	$^{\circ}C/W$
$T_J$	Operating Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$

### Notes:

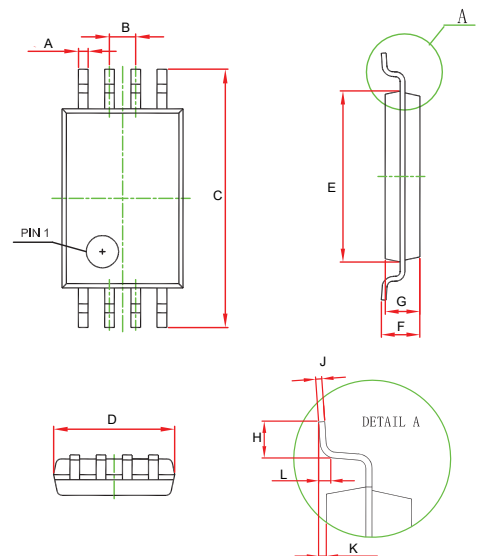
1. Repetitive Rating: Pulse width limited by junction temperature.

## Equivalent Circuit



## Dual N-Channel MOSFET

## TSSOP-8



DIM	Dimensions				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.007	.012	0.190	0.300	
B	0.026BSC.		0.650BSC.		
C	0.246	0.258	6.250	6.550	
D	0.114	0.122	2.900	3.100	
E	0.169	0.177	4.300	4.500	
F	---	0.047	---	1.200	
G	0.031	0.039	0.800	1.000	
H	0.020	0.028	0.500	0.700	
J	0.004	0.008	0.090	0.200	
K	0.002	0.006	0.050	0.150	
L	0.010TYP.		0.250TYP.		

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

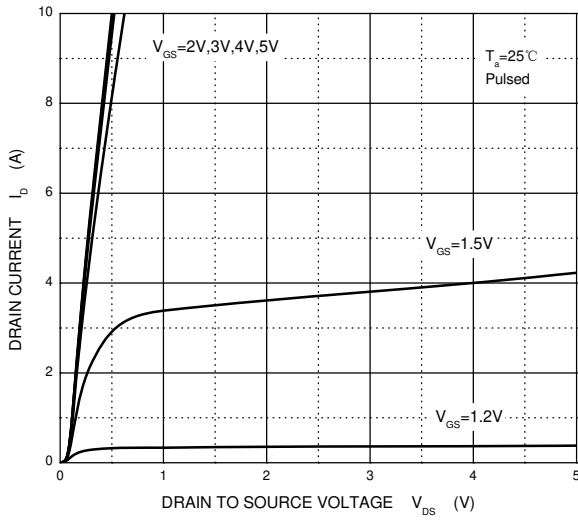
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 16V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 10$	$\mu A$
Gate threshold voltage (note 1)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.8	1.1	V
Drain-source on-resistance (note 1)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 7A$		14	21	$m\Omega$
		$V_{GS} = 4.5V, I_D = 6.6A$		16	24	$m\Omega$
		$V_{GS} = 3.8V, I_D = 6A$		17.5	28	$m\Omega$
		$V_{GS} = 2.5V, I_D = 5.5A$		21	32	$m\Omega$
		$V_{GS} = 1.8V, I_D = 2A$		31	50	$m\Omega$
Forward tranconductance (note 1)	$g_{FS}$	$V_{DS} = 5V, I_D = 7A$	9			S
Diode forward voltage(note 1)	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$			1	V
<b>DYNAMIC PARAMETERS (note 2)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		650		pF
Output Capacitance	$C_{oss}$			140		pF
Reverse Transfer Capacitance	$C_{rss}$			60		pF
Total gate charge	$Q_g$	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 6A$		8		nC
Gate-source charge	$Q_{gs}$			2.5		nC
Gate-drain charge	$Q_{gd}$			3		nC
<b>SWITCHING PARAMETERS(note 2)</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 5V, V_{DD} = 10V,$ $R_L = 1.5\Omega, R_{GEN} = 3\Omega$		0.5		ns
Turn-on rise time	$t_r$			1		ns
Turn-off delay time	$t_{d(off)}$			12		ns
Turn-off fall time	$t_f$			4		ns

**Notes :**

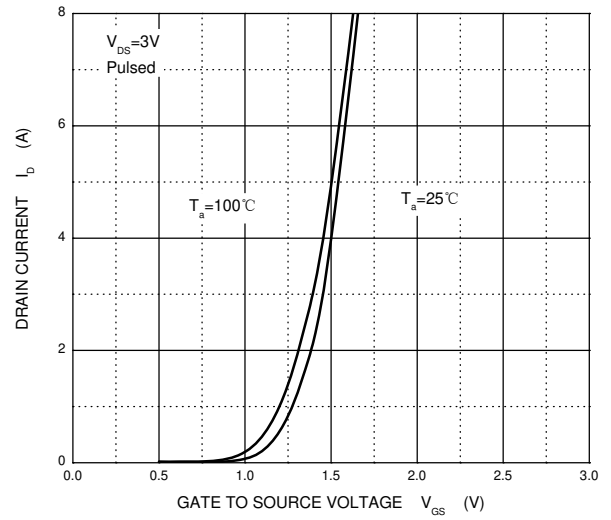
1. Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 0.5\%$ .
2. Guaranteed by design, not subject to production testing.

## Typical Characteristics

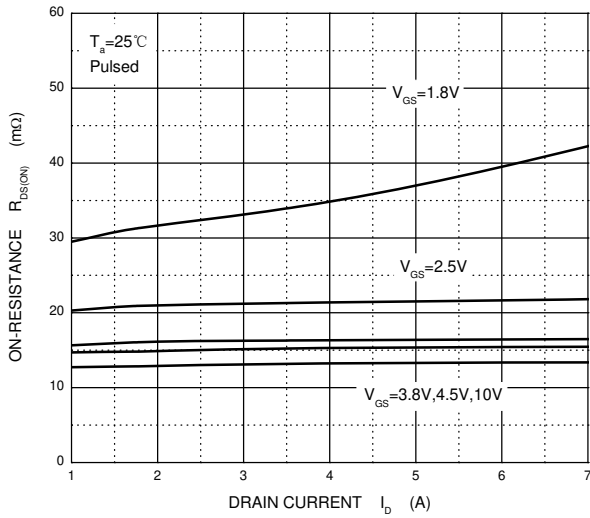
**Output Characteristics**



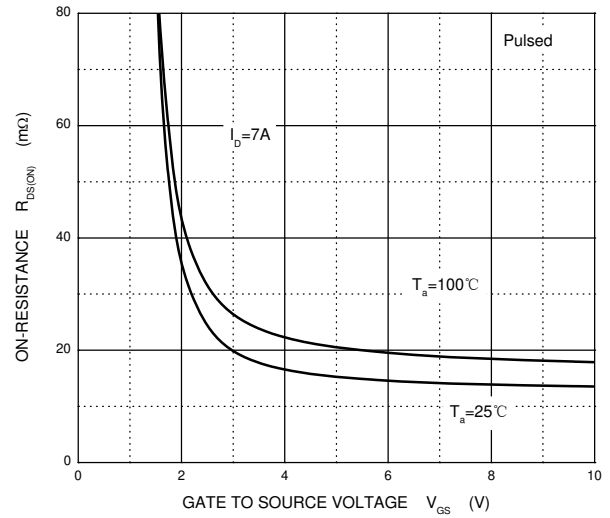
**Transfer Characteristics**



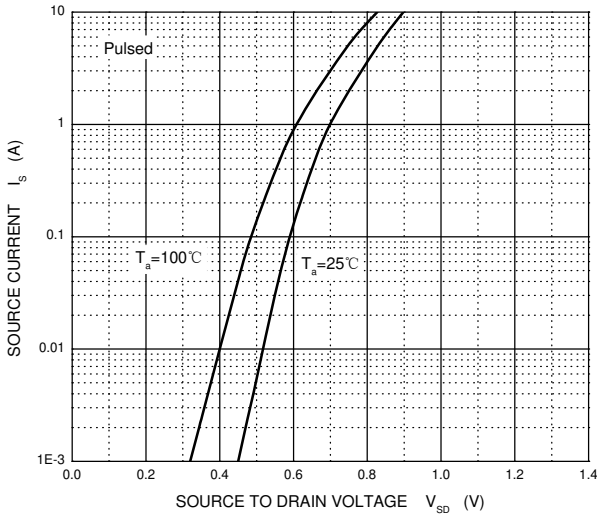
**$R_{DS(ON)}$  —  $I_D$**



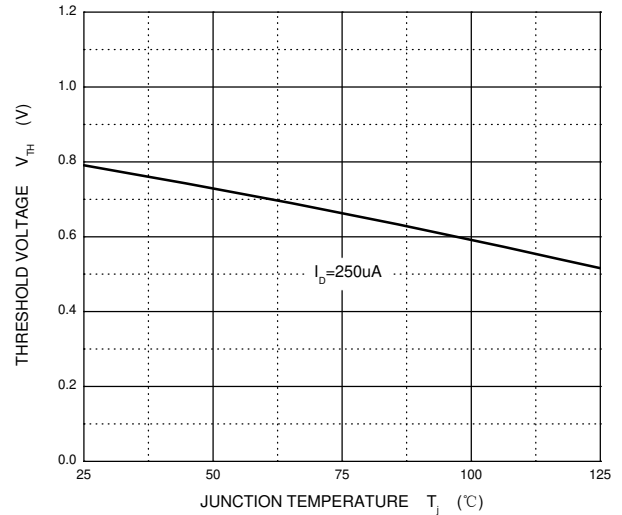
**$R_{DS(ON)}$  —  $V_{GS}$**



**$I_S$  —  $V_{SD}$**



**Threshold Voltage**





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## Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel:5Kpcs/Reel

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

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