

**Features**

- AEC-Q101 Qualification
- 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
- Halogen Free. "Green" Device (Note 1)

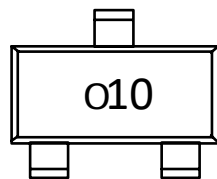
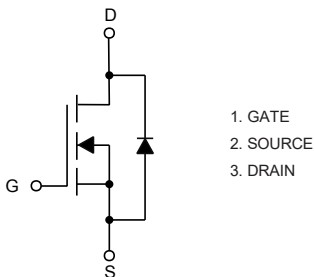
**Maximum Ratings**

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 105°C/W Junction to Ambient (Note 2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current	$I_D$	3.0	A
Pulsed Drain Current (Note 3)	$I_{DM}$	10	A
Total Power Dissipation	$P_D$	1.2	W

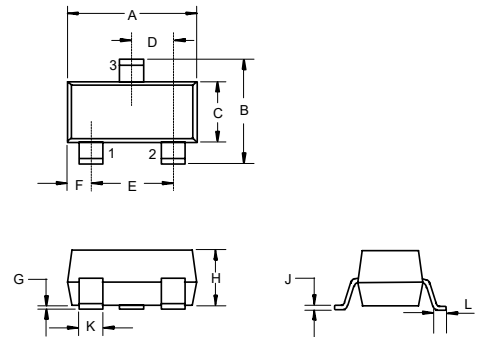
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.  
 2. Device Mounted on FR-4 PCB, 1 inch 2 pad of 2oz copper.  
 3. Repetitive Rating : Pulse Width Limited by Junction Temperature.

**Internal Structure and Marking Code**



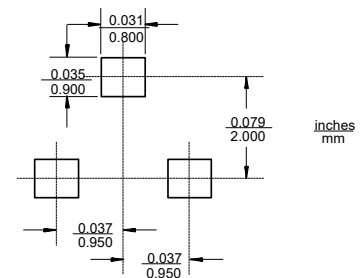
**N-Channel  
Enhancement Mode  
Field Effect Transistor**

**SOT-23**



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.014	0.020	0.35	0.51	
L	0.007	0.020	0.20	0.50	

**Suggested Solder Pad Layout**



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
		$V_{DS}=0V, V_{GS}=\pm 10V$			$\pm 50$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage <sup>(Note4)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.90		2.0	V
Drain-Source On-Resistance <sup>(Note4)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=3A$			100	m $\Omega$
		$V_{GS}=4.5V, I_D=2A$			120	m $\Omega$
Diode Forward Voltage <sup>(Note4)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=3A$			1.2	V
<b>Dynamic Characteristics<sup>(Note5,6)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		409		pF
Output Capacitance	$C_{oss}$			50		
Reverse Transfer Capacitance	$C_{rss}$			41		
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=3A$		10.27		nC
Gate-Source Charge	$Q_{gs}$			1.65		
Gate-Drain Charge	$Q_{gd}$			2.11		
Reverse Recovery Charge	$Q_{rr}$	$I_{SD}=3A, di/dt=100A/us$		6.99		ns
Reverse Recovery Time	$T_{rr}$			32.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=30V,$ $R_L=20\Omega, R_G=3\Omega$		3.6		ns
Turn-On Rise Time	$t_r$			17.6		
Turn-Off Delay Time	$t_{d(off)}$			13		
Turn-Off Fall Time	$t_f$			23		

Note 4. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

5. Switching characteristics are independent of operating junction temperature.

6. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Output Characteristics

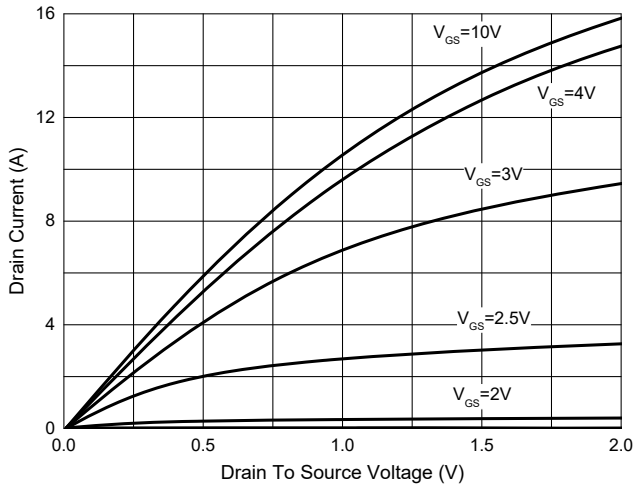


Fig. 2 - Transfer Characteristics

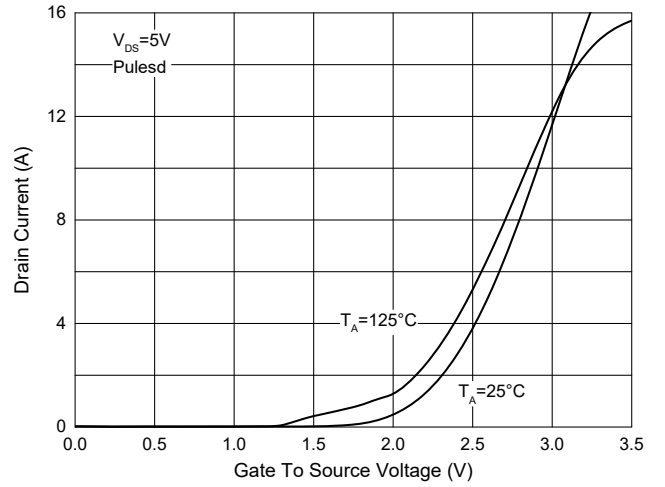


Fig. 3 -  $R_{DS(ON)} - I_D$

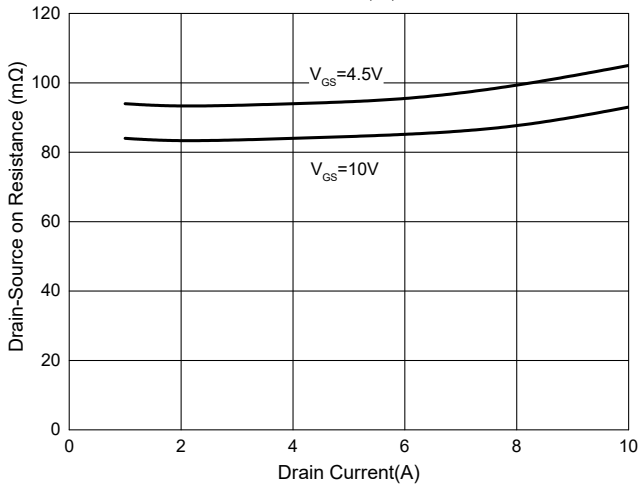


Fig. 4 - Normalized On Resistance Characteristics

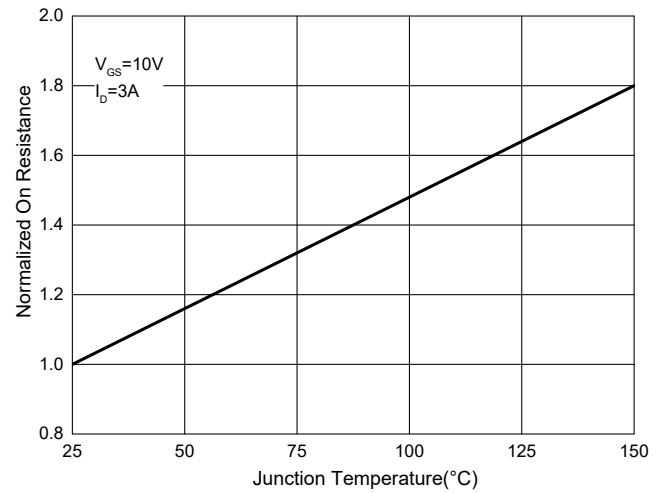


Fig. 5 - Gate Charge

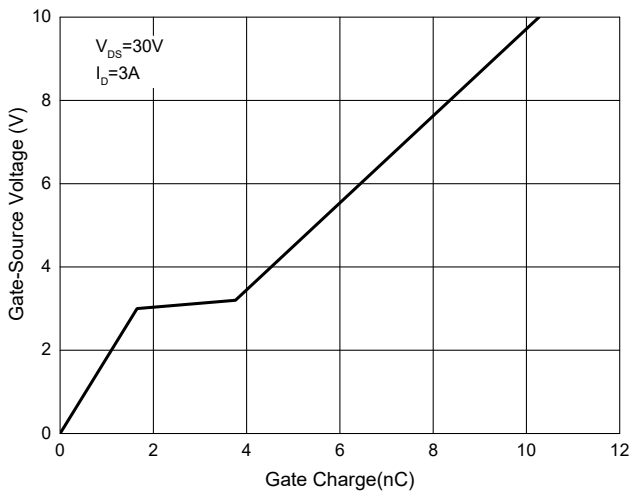
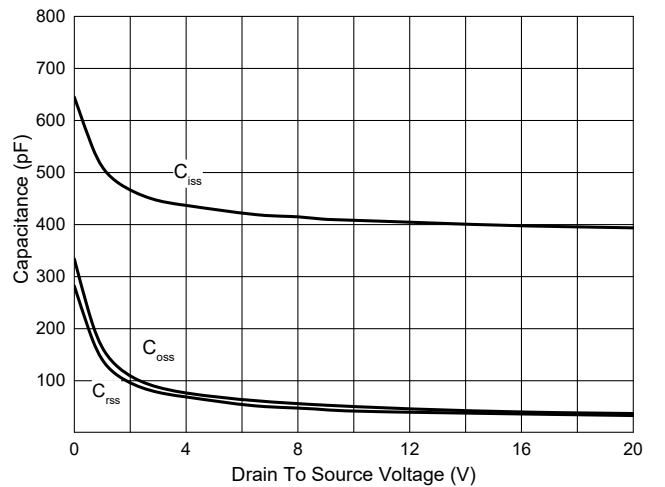


Fig. 6 - Capacitance Characteristics



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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