

### Features

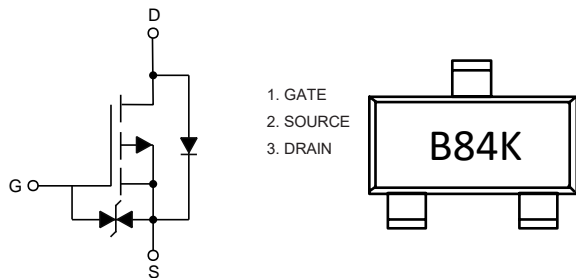
- Energy Efficient
- ESD Protected up to 2KV (HBM)
- Low Threshold Voltage
- High Speed Switching
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

### Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 556°C/W Junction to Ambient (Note3)

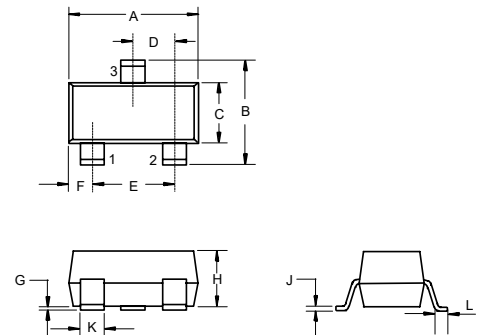
Parameter	Symbol	Rating	Unit
Drain -source Voltage	$V_{DS}$	-60	V
Gate -Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous	$I_D$	-0.13	A
Plused Drain Current @ $t_p < 100\mu s$ (Note2)	$I_{DM}$	-0.52	A
Power Dissipation	$P_D$	0.225	W

### Internal Structure and Marking Code



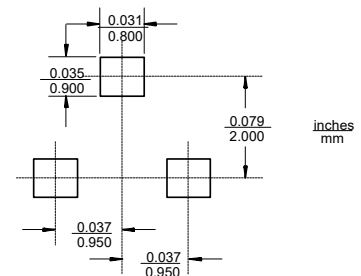
## P-Channel MOSFET

### SOT-23



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	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	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

### Suggested Solder Pad Layout



**ELECTRICAL CHARACTERISTICS (Ta=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-Threshold Voltage <sup>(Note 4)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.8	-1.5	-2.5	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 10$	$\mu A$
Drain Leakage Current	$I_{DSS}$	$V_{DS}=-48V, V_{GS}=0V$			-1	$\mu A$
Drain-Source On-Resistance <sup>(Note 4)</sup>	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-0.5A$		2.2	6.0	$\Omega$
		$V_{GS}=-4.5V, I_D=-0.2A$		2.5	7.0	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-0.5A$			-1.3	V
<b>Dynamic Characteristics<sup>(Note 4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-5V, V_{GS}=0V, f=1MHz$		30		pF
Output Capacitance	$C_{oss}$			10		
Reverse Transfer Capacitance	$C_{rss}$			5		
<b>Switching Characteristics<sup>(Note 5)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-30V, V_{GEN}=-10V, R_G=3.9\Omega, R_L=75\Omega, I_{DS}=-0.4A$		5.7		ns
Turn-On Rise Time	$t_r$			5.1		
Turn-Off Delay Time	$t_{d(off)}$			28		
Turn-Off Fall Time	$t_f$			20		

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. Repetitive rating: Pulse width limited by junction temperature.

3. Surface mounted on FR4 board,  $t_s \leq 10s$ .

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

5. Guaranteed by design, not subject to production.

**Curve Characteristics**

Fig. 1 - Output Characteristics

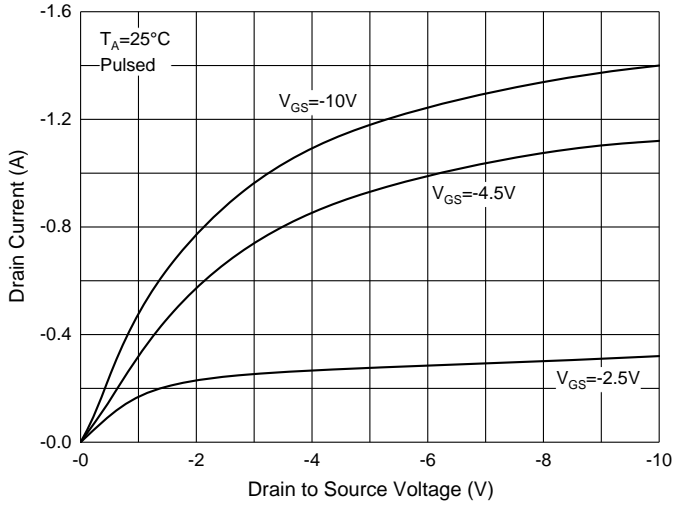


Fig. 2 - Transfer Characteristics

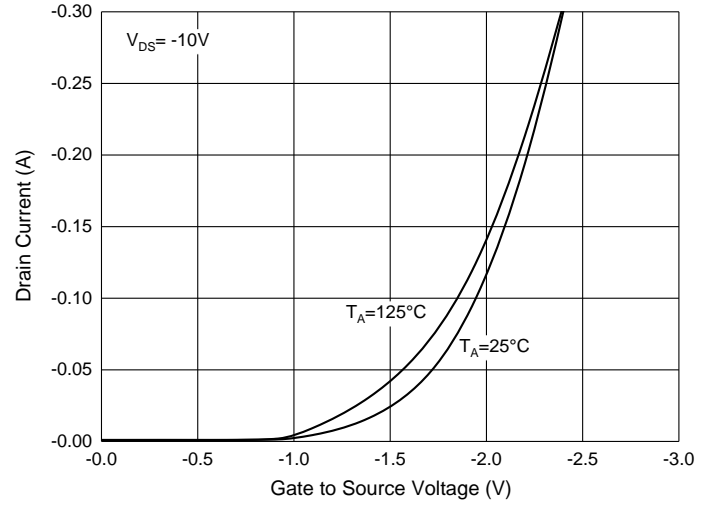


Fig. 3 -  $R_{DS(ON)} - I_D$

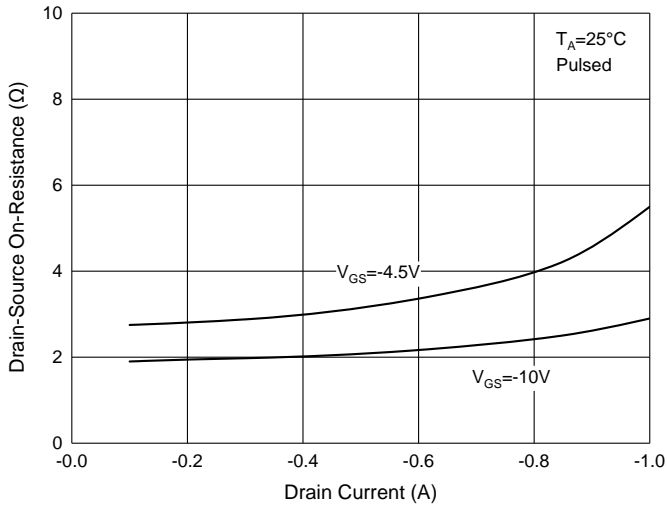


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

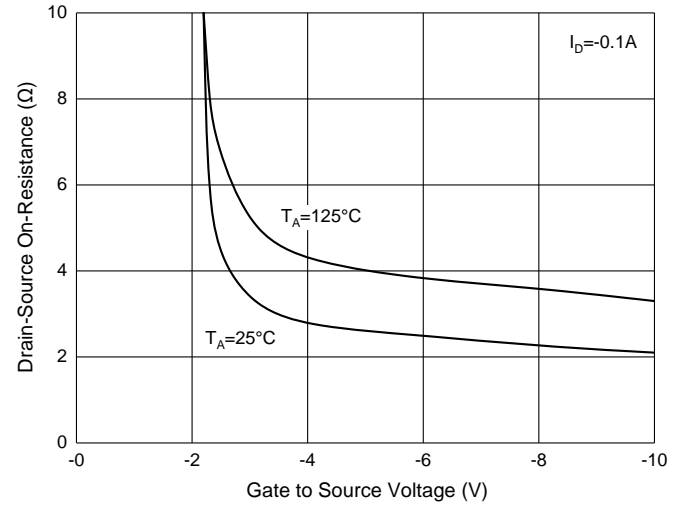


Fig. 5 -  $I_S - V_{SD}$

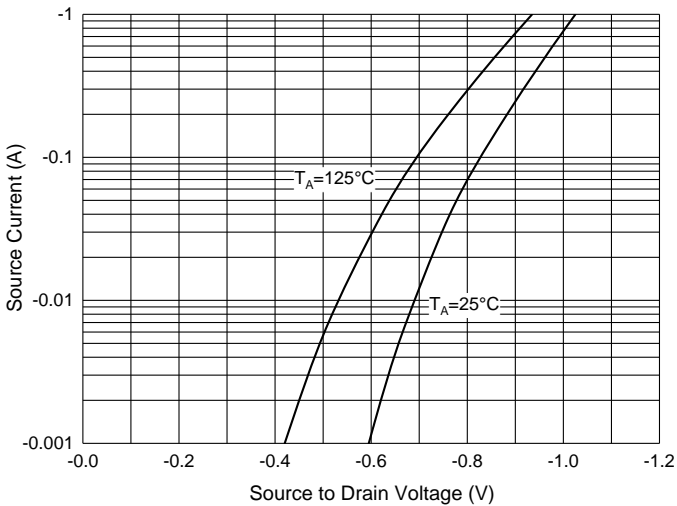
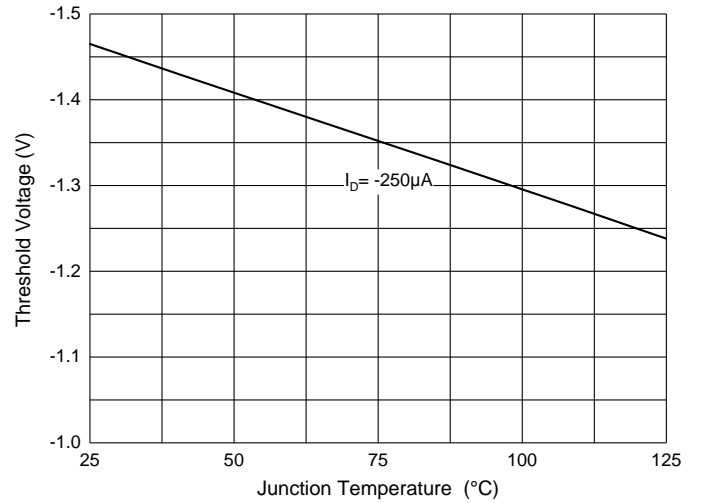
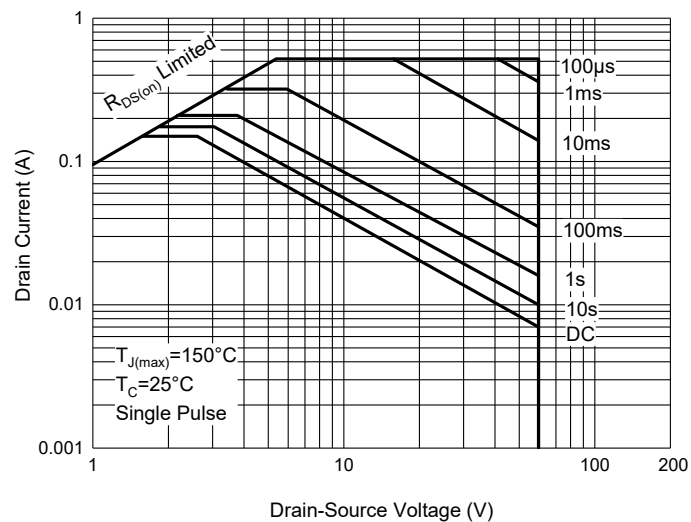


Fig. 6 - Threshold Voltage



## Curve Characteristics

Fig. 7 - Safe Operation Area



## Ordering Information

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

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