



# THE DATASHEET OF BSS84A-TP



### Features

- High Density Cell Design for Ultra Low  $R_{DS(on)}$
- Rugged and Reliable
- 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)

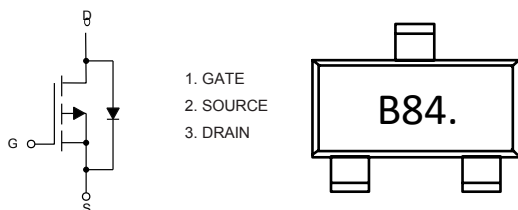
### Maximum Ratings

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

| Parameter                | Symbol   | Rating | Unit |
|--------------------------|----------|--------|------|
| Drain-Source Voltage     | $V_{DS}$ | -60    | V    |
| Gate-Source Voltage      | $V_{GS}$ | ±30    | V    |
| Continuous Drain Current | $I_D$    | -0.17  | A    |
| Pulsed Drain Current     | $I_{DM}$ | -0.68  | A    |
| Total Power Dissipation  | $P_D$    | 225    | mW   |

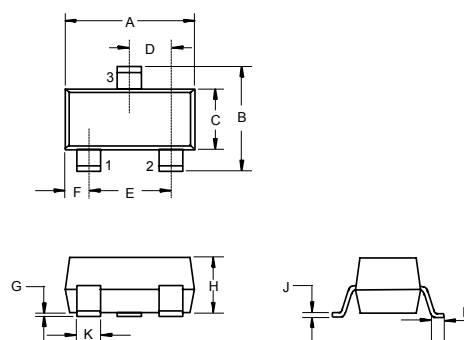
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

### Internal Structure and Marking Code



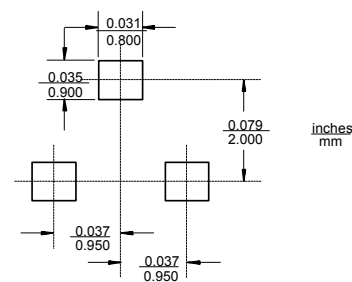
## P-CHANNEL MOSFET

### 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   | 0.012  | 0.020 | 0.30 | 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                        | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 30V$            |      |     | $\pm 500$ | nA       |
|  |               | $V_{DS}=0V, V_{GS}=\pm 20V$            |      |     | $\pm 100$ | nA       |
| Zero Gate Voltage Drain Current                    | $I_{DSS}$     | $V_{DS}=-60V, V_{GS}=0V$               |      |     | -5        | $\mu A$  |
|  |               | $V_{DS}=-25V, V_{GS}=0V$               |      |     | -0.1      | $\mu A$  |
| Gate-Threshold Voltage <sup>(Note 2)</sup>         | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=-250\mu A$         | -0.9 |     | -2        | V        |
| Drain-Source On-Resistance <sup>(Note2)</sup>      | $R_{DS(on)}$  | $V_{GS}=-5V, I_D=-0.1A$                |      |     | 10        | $\Omega$ |
|  |               | $V_{GS}=-10V, I_D=-0.1A$               |      |     | 8         |          |
| Diode Forward Voltage <sup>(Note 2)</sup>          | $V_{SD}$      | $V_{GS}=0V, I_S=-0.17A$                |      |     | -2.2      | V        |
| Forward Transconductance <sup>(Note 2)</sup>       | $g_{FS}$      | $V_{DS}=-25V, I_D=-100mA$              | 50   |     |           | mS       |
| <b>Dynamic Characteristics<sup>(Note3)</sup></b>   |               |  |      |     |           |          |
| Input Capacitance                                  | $C_{iss}$     | $V_{DS}=-25V, V_{GS}=0V, f=1MHz$       |      | 30  |           | pF       |
| Output Capacitance                                 | $C_{oss}$     |  |      | 10  |           |          |
| Reverse Transfer Capacitance                       | $C_{rss}$     |  |      | 5   |           |          |
| <b>Switching Characteristics<sup>(Note3)</sup></b> |               |  |      |     |           |          |
| Turn-On Delay Time                                 | $t_{d(on)}$   | $V_{GS}=-10V, V_{DS}=-25V, I_D=-100mA$ |      | 15  |           | ns       |
| Turn-On Rise Time                                  | $t_r$         |  |      | 6   |           |          |
| Turn-Off Delay Time                                | $t_{d(off)}$  |  |      | 15  |           |          |
| Turn-Off Fall Time                                 | $t_f$         |  |      | 11  |           |          |

Note: 2. Pulse Test : Pulse Width  $\leq 80\mu s$ , Duty Cycle  $\leq 0.5\%$ .

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

**Curve Characteristics**

Fig. 1 - Output Characteristics

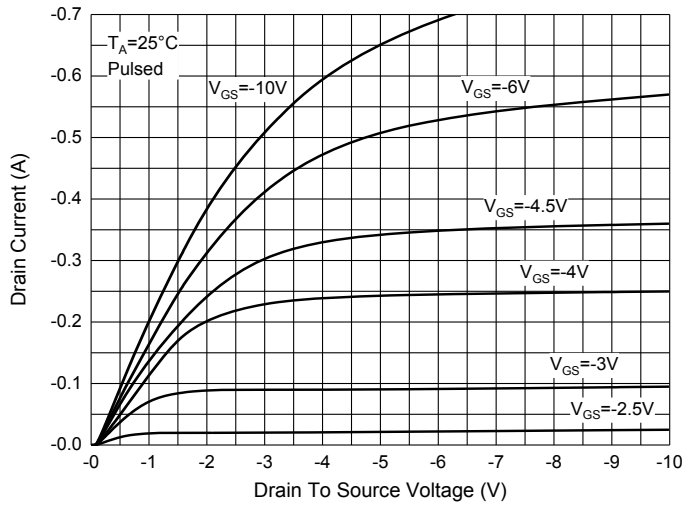


Fig. 2 - Transfer Characteristics

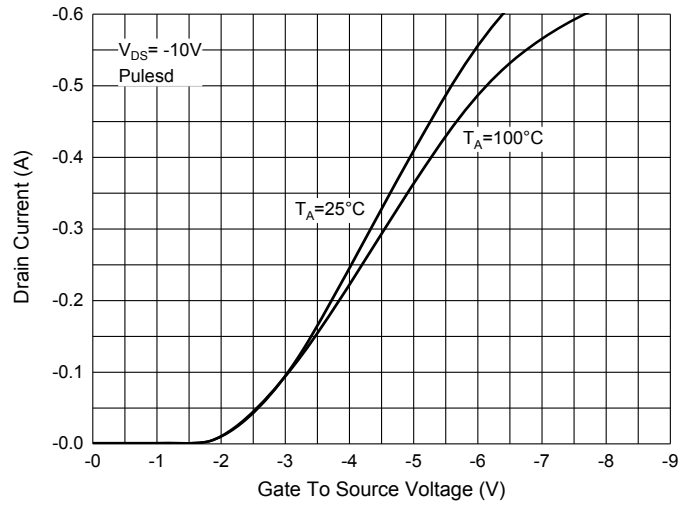


Fig. 3 -  $R_{DS(ON)} - I_D$

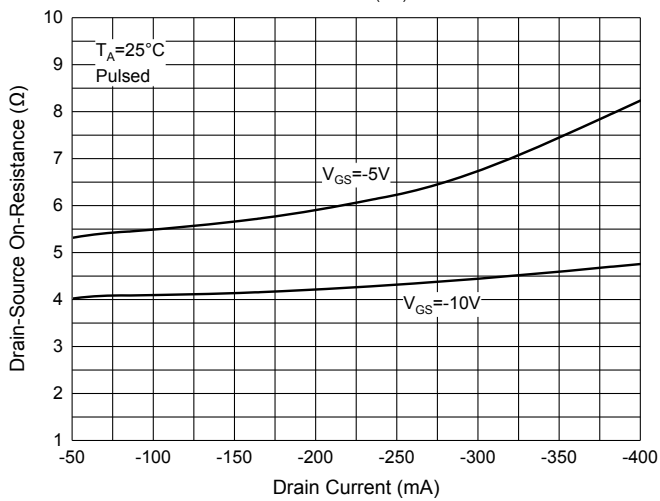


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

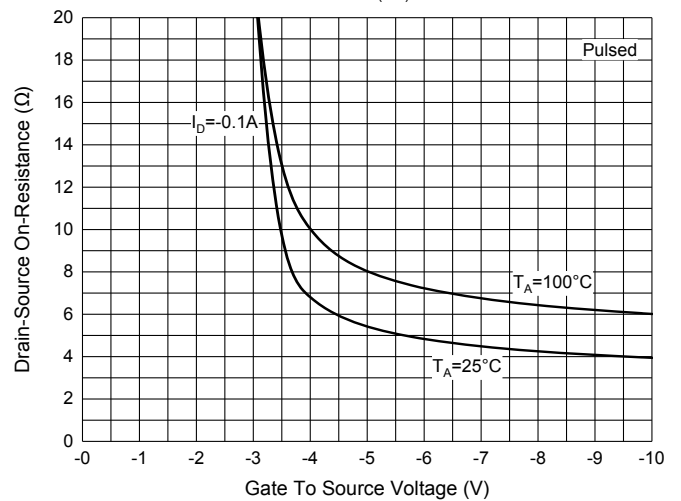


Fig. 5 -  $I_S - V_{SD}$

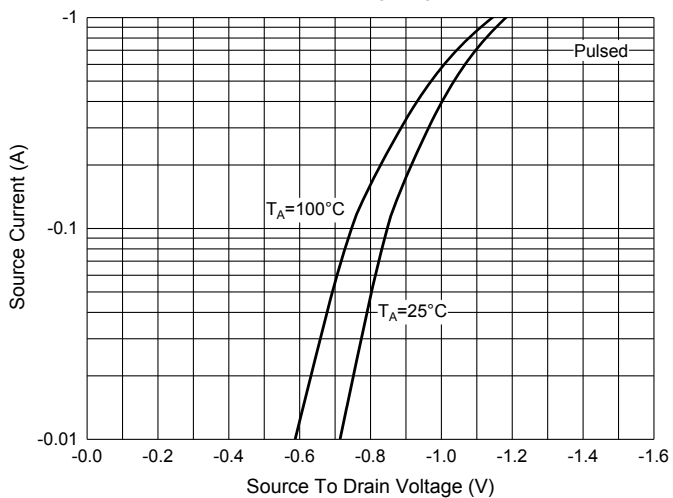
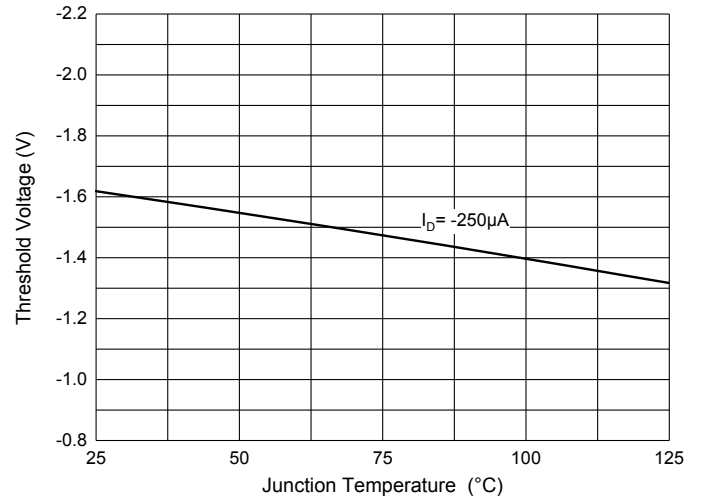


Fig. 6 - Threshold Voltage



## Ordering Information

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

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