

## WPM2341A

### P-Channel Enhancement Mode Mosfet

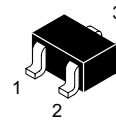
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

#### Features

- Higher Efficiency Extending Battery Life
- Miniature SOT23-3 Surface Mount Package
- Super high density cell design for extremely low RDS (ON)

#### Applications

- DC/DC Converter
- Load Switch
- Battery Powered System
- LCD Display inverter
- Power Management in Portable, Battery Powered Products

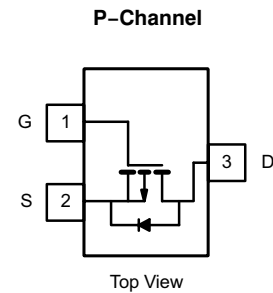


SOT 23-3

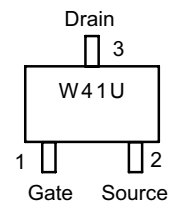
pin connections :

| ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted |                |                                  |              |                  |   |
|--|----------------|----------------------------------|--------------|------------------|---|
| Parameter  | Symbol         | 5 s                              | Steady State | Unit             |   |
| Drain-Source Voltage   | $V_{DS}$       | -20                              |              | V                |   |
| Gate-Source Voltage  | $V_{GS}$       | $\pm 12$                         |              |                  |   |
| Continuous Drain Current<br>( $T_J = 150\text{ }^\circ\text{C}$ ) <sup>a</sup>     | $I_D$          | $T_A = 25\text{ }^\circ\text{C}$ | -4.3         | -3.5             | A |
|  |                | $T_A = 80\text{ }^\circ\text{C}$ | -3.2         | -2.5             |   |
| Pulsed Drain Current   | $I_{DM}$       | -20                              |              | A                |   |
| Continuous Source Current<br>(Diode Conduction) <sup>a</sup>                       | $I_S$          | -1.7                             | -1           | A                |   |
| Maximum Power<br>Dissipation <sup>a</sup>  | $P_D$          | $T_A = 25\text{ }^\circ\text{C}$ | 1.25         | 0.75             | W |
|  |                | $T_A = 80\text{ }^\circ\text{C}$ | 0.7          | 0.42             |   |
| Operating Junction and Storage<br>Temperature Range                                | $T_J, T_{stg}$ | - 55 to 150                      |              | $^\circ\text{C}$ |   |

a. Surface Mounted on FR4 Board using 1 in sq pad size, 2oz Cu.



**Marking:**



W 41= Specific Device Code  
U = Date Code

#### Order information

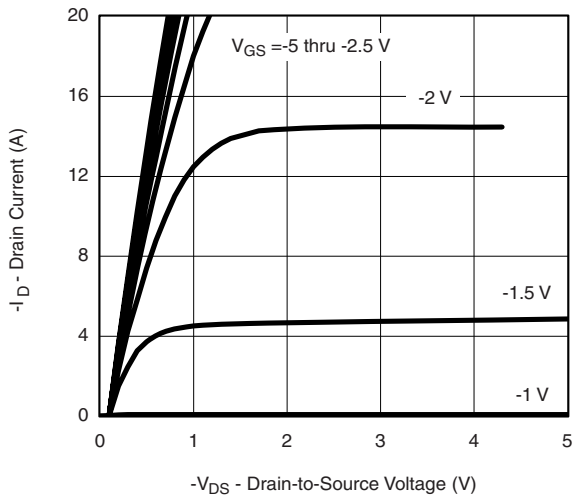
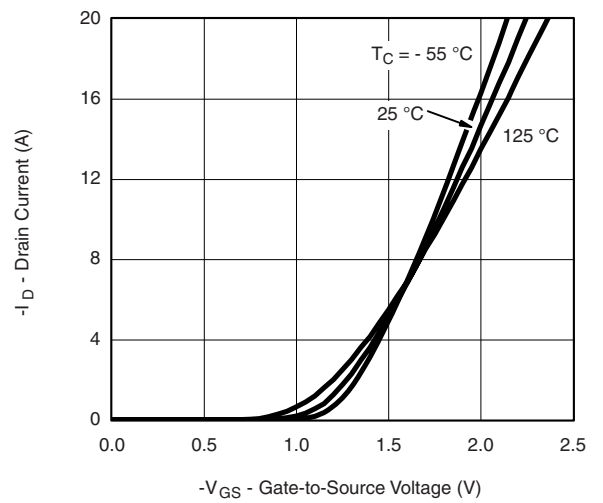
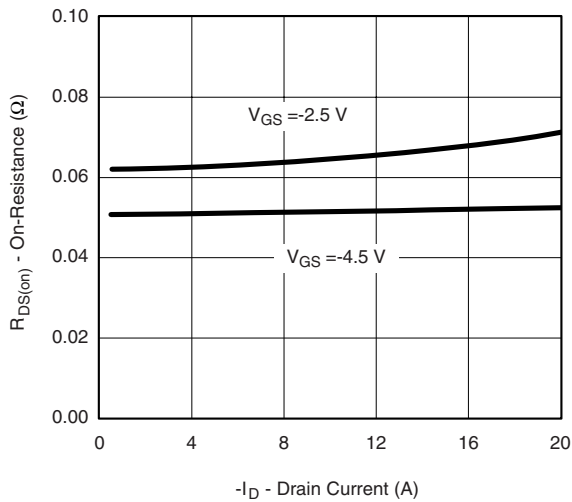
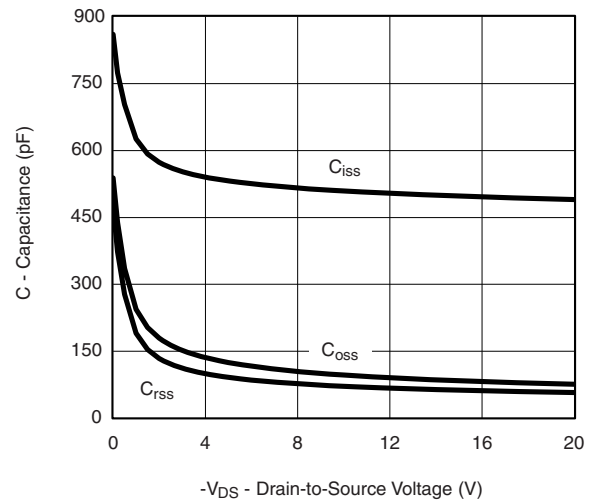
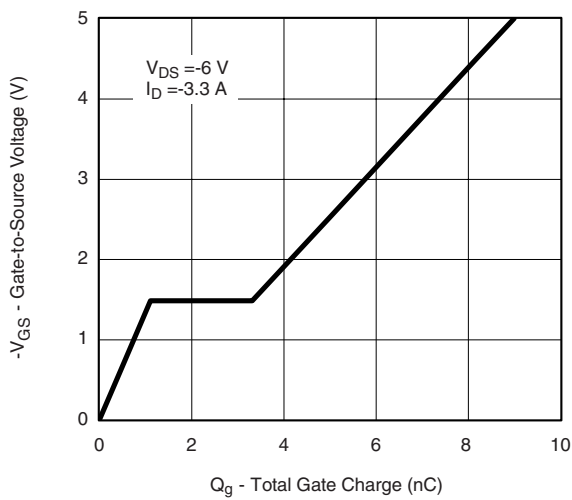
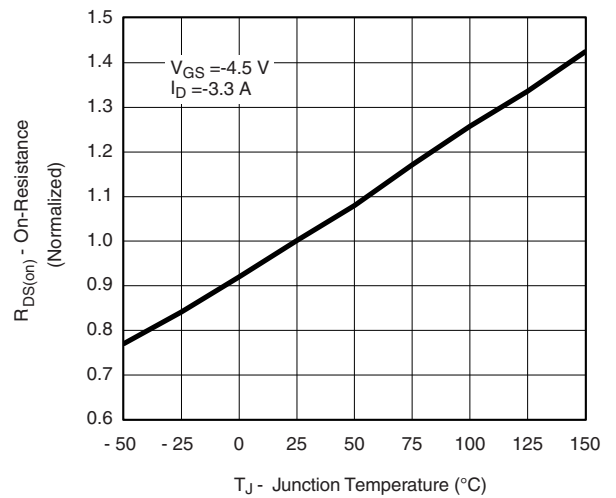
| Part Number   | Package | Shipping         |
|---------------|---------|------------------|
| WPM2341A-3/TR | SOT23-3 | 3000 Tape & Reel |

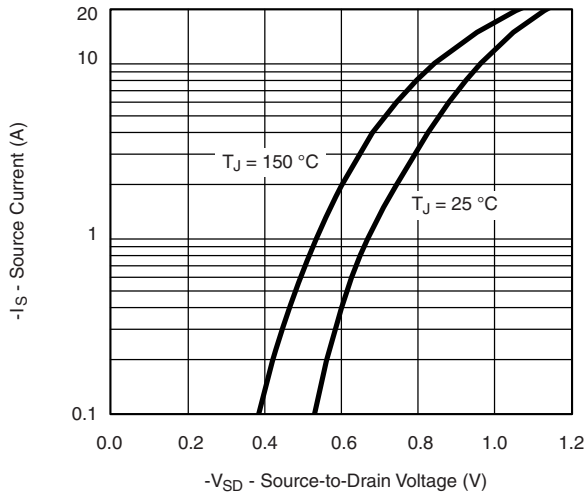
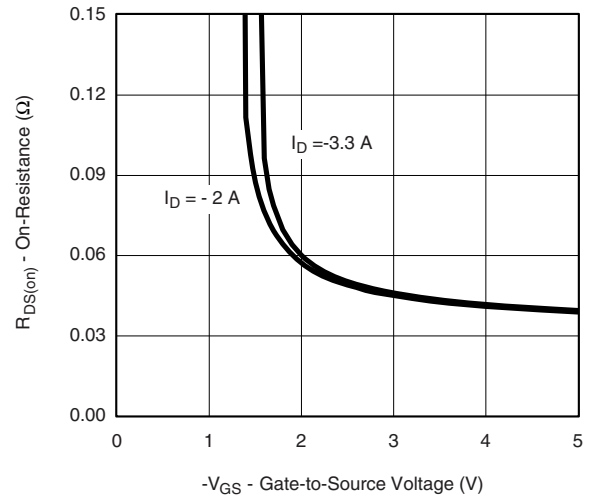
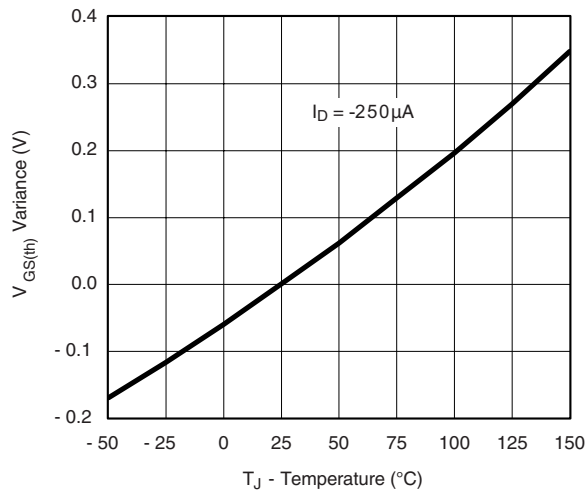
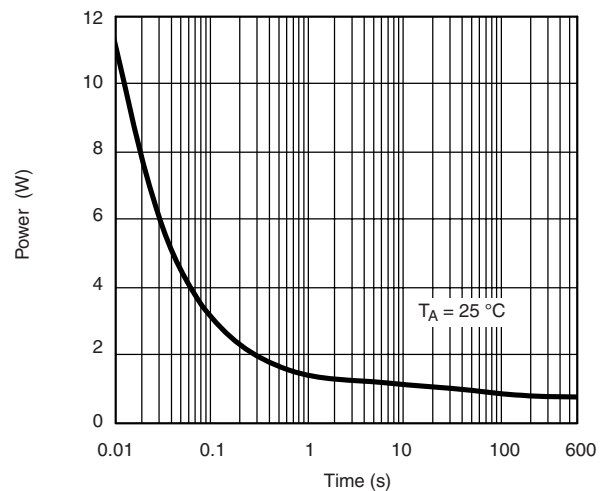
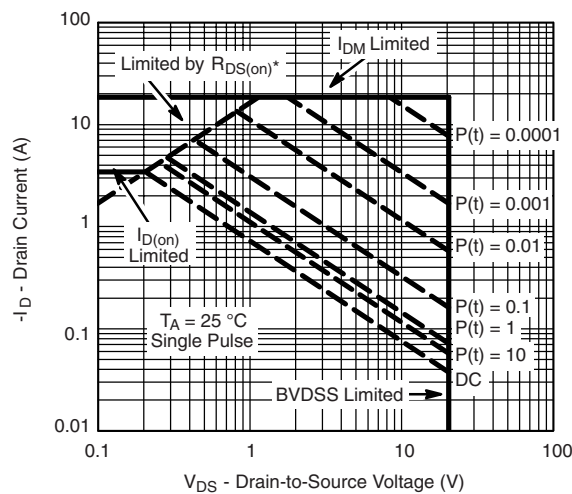
| THERMAL RESISTANCE RATINGS                          |              |                  |         |         |      |
|---|--------------|------------------|---------|---------|------|
| Parameter   |              | Symbol           | Typical | Maximum | Unit |
| Junction-to-Ambient Thermal Resistance <sup>b</sup> | t ≤ 5 s      | R <sub>θJA</sub> | 75      | 100     | °C/W |
|   | Steady State |                  | 125     | 165     |      |

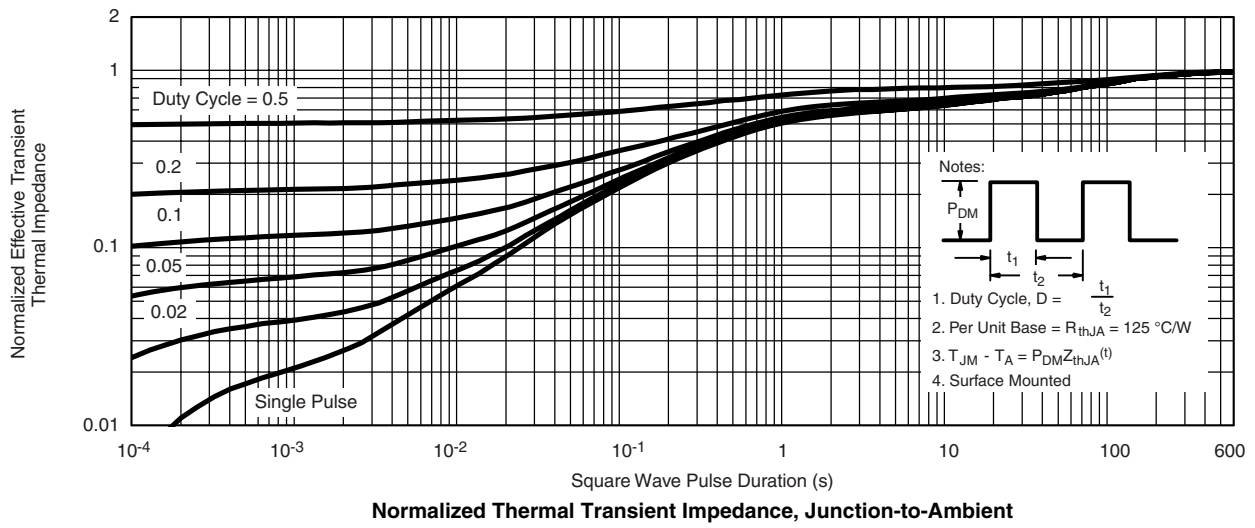
b. Surface Mounted on FR4 Board using 1 in sq pad size, 2oz Cu.

**MOSFET ELECTRICAL CHARACTERISTICS**(T<sub>J</sub> =25 °C unless otherwise specified)

| Parameter   | Symbol              | Test Condition   | Min   | Typ   | Max   | Units |
|---|---------------------|--|-------|-------|-------|-------|
| <b>Off Characteristics</b>                                    |                     |  |       |       |       |       |
| Drain-Source Breakdown Voltage                                | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA  | -20   |       |       | V     |
| Zero Gate Voltage Drain Current                               | I <sub>DSS</sub>    | V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V   |       |       | -1    | μA    |
| Gate –Source leakage current                                  | I <sub>GSS</sub>    | V <sub>GS</sub> = ±12 V, V <sub>DS</sub> = 0V  |       |       | ± 100 | nA    |
| <b>On Characteristics</b>                                     |                     |  |       |       |       |       |
| Gate Threshold Voltage  | V <sub>GS(th)</sub> | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250μA  | -0.35 | -0.63 | -1.00 | V     |
| Static Drain-Source On-Resistance                             | R <sub>DS(on)</sub> | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.3A  |       | 52    | 61    | mΩ    |
|   |                     | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.8 A   |       | 65    | 71    | mΩ    |
| Forward Transconductance                                      | g <sub>FS</sub>     | V <sub>DS</sub> = -5 V, I <sub>D</sub> = -3.3A   |       | 3.0   |       | S     |
| <b>Dynamic Characteristics</b>                                |                     |  |       |       |       |       |
| Input Capacitance   | C <sub>iss</sub>    | V <sub>DS</sub> = -6 V, V <sub>GS</sub> = 0V,<br>f = 1.0 MHz                                       |       |       | 700   | pF    |
| Output Capacitance  | C <sub>oss</sub>    |  |       |       | 160   | pF    |
| Reverse Transfer Capacitance                                  | C <sub>iss</sub>    |  |       |       | 120   | pF    |
| <b>Switching Characteristics</b>                              |                     |  |       |       |       |       |
| Turn-On Delay Time  | t <sub>d(on)</sub>  | V <sub>GS</sub> = -4.5V, V <sub>DD</sub> = -6 V,<br>I <sub>D</sub> = -1.0A, R <sub>G</sub> = 6.0Ω, |       |       | 25    | ns    |
| Turn-On Rise Time   | t <sub>r</sub>      |  |       |       | 55    | ns    |
| Turn-Off Delay Time   | t <sub>d(off)</sub> |  |       |       | 90    | ns    |
| Turn-Off Fall Time  | t <sub>f</sub>      |  |       |       | 60    | ns    |
| Total Gate Charge   | Q <sub>G(TOT)</sub> | V <sub>DS</sub> = -6 V, I <sub>D</sub> = -3.3A,<br>V <sub>GS</sub> = -4.5V                         |       | 8     | 13    | nC    |
| Threshold gate charge   | Q <sub>G(TH)</sub>  |  |       | 0.2   |       | nC    |
| Gate-Source Charge  | Q <sub>GS</sub>     |  |       | 1.2   |       | nC    |
| Gate-Drain Charge   | Q <sub>GD</sub>     |  |       | 2.2   |       | nC    |
| <b>Drain-Source Diode Characteristics and Maximun Ratings</b> |                     |  |       |       |       |       |
| Forward Diode Voltage   | V <sub>SD</sub>     | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.6A   |       | -0.8  |       | V     |

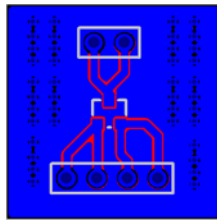
**Typical Characteristics** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)

**Output Characteristics**

**Transfer Characteristics**

**On-Resistance vs. Drain Current**

**Capacitance**

**Gate Charge**

**On-Resistance vs. Junction Temperature**

**Typical Characteristics** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)

**Source-Drain Diode Forward Voltage**

**On-Resistance vs. Gate-to-Source Voltage**

**Threshold Voltage**

**Single Pulse Power**

**Safe Operating Area**

**Typical Characteristics** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)


## Power Dissipation Characteristics

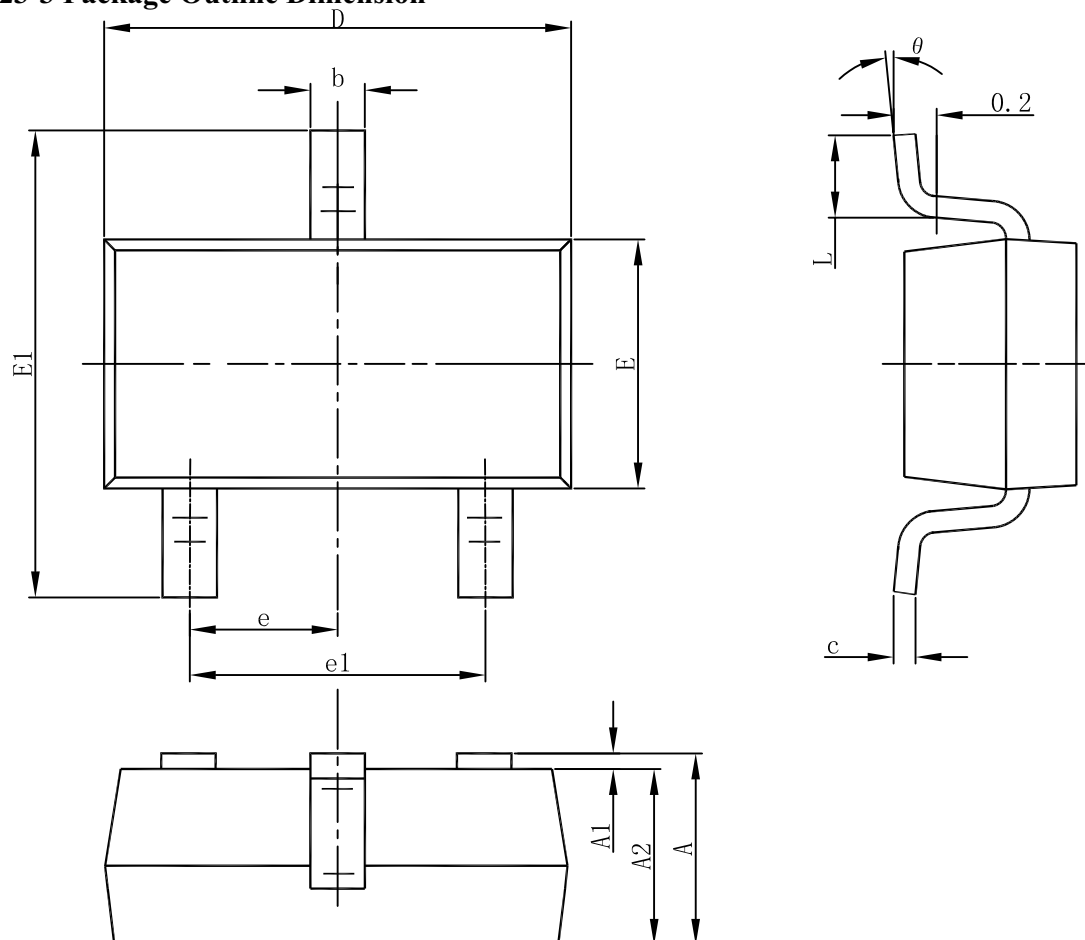
1. The package of WPM2341A is SOT23-3, surface mounted on FR4 Board using 1 in sq pad size, 2 oz Cu,  $R_{\theta JA}$  is 125 °C/W.
2. The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^{\circ}\text{C}$ , and the relation between  $T_J$  and  $P_D$  is  $T_J = T_a + R_{\theta JA} * P_D$ , the maximum power dissipation is determined by  $R_{\theta JA}$ .
3. The  $R_{\theta JA}$  is the thermal impedance from junction to ambient, using larger PCB pad size can get smaller  $R_{\theta JA}$  and result in larger maximum power dissipation.



125 °C/W when mounted on  
a 1 in<sup>2</sup> pad of 2 oz copper.

## Packaging Information

### SOT23-3 Package Outline Dimension



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1     | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |