



### General Description

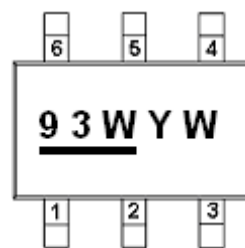
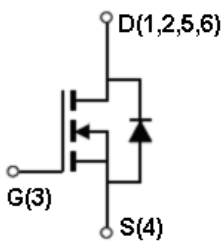
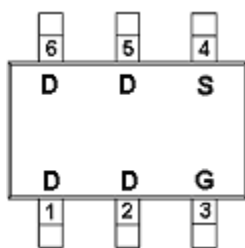
AFP3493W, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

### Features

- -20V/-7.3A,  $R_{DS(ON)}=28m\Omega@V_{GS}=4.5V$
- -20V/-4.0A,  $R_{DS(ON)}=32m\Omega@V_{GS}=2.5V$
- -20V/-2.2A,  $R_{DS(ON)}=36m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

### Pin Description ( TSOP-6 )



### Application

- Load Switch
- PA Switch
- Battery Switch

### Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | D      | Drain       |
| 2   | D      | Drain       |
| 3   | G      | Gate        |
| 4   | S      | Source      |
| 5   | D      | Drain       |
| 6   | D      | Drain       |

### Ordering Information

| Part Ordering No. | Part Marking  | Package | Unit        | Quantity |
|-------------------|---------------|---------|-------------|----------|
| AFP3493WTS6RG     | <u>93W</u> YW | TSOP-6  | Tape & Reel | 3000 EA  |

- ※ 93W parts code
- ※ Y year code ( 0 ~ 9 )
- ※ W week code ( A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52 )
- ※ AFP3493WTS6RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



### Absolute Maximum Ratings

(T<sub>A</sub>=25°C Unless otherwise noted)

| Parameter                                       | Symbol           | Typical                      | Unit |
|-------------------------------------------------|------------------|------------------------------|------|
| Drain-Source Voltage                            | V <sub>DSS</sub> | -20                          | V    |
| Gate –Source Voltage                            | V <sub>GSS</sub> | ±12                          | V    |
| Continuous Drain Current(T <sub>J</sub> =150°C) | I <sub>D</sub>   | T <sub>A</sub> =25°C<br>-7.3 | A    |
|                                                 |                  | T <sub>A</sub> =70°C<br>-5.8 |      |
| Pulsed Drain Current                            | I <sub>DM</sub>  | -25                          | A    |
| Continuous Source Current(Diode Conduction)     | I <sub>S</sub>   | -1.7                         | A    |
| Power Dissipation                               | P <sub>D</sub>   | T <sub>A</sub> =25°C<br>2.0  | W    |
|                                                 |                  | T <sub>A</sub> =70°C<br>1.3  |      |
| Operating Junction Temperature                  | T <sub>J</sub>   | 150                          | °C   |
| Storage Temperature Range                       | T <sub>STG</sub> | -55/150                      | °C   |
| Thermal Resistance-Junction to Ambient          | R <sub>θJA</sub> | 120                          | °C/W |

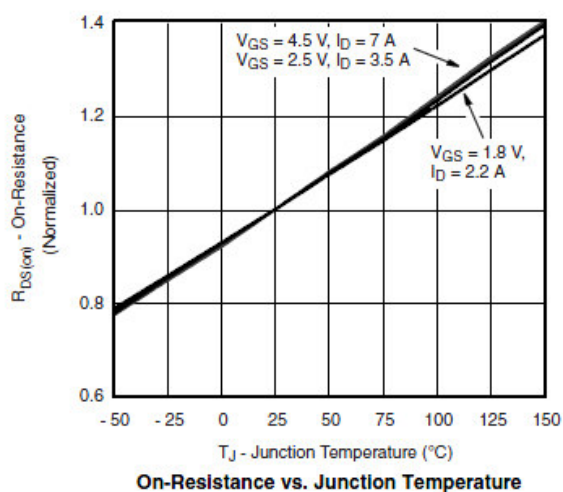
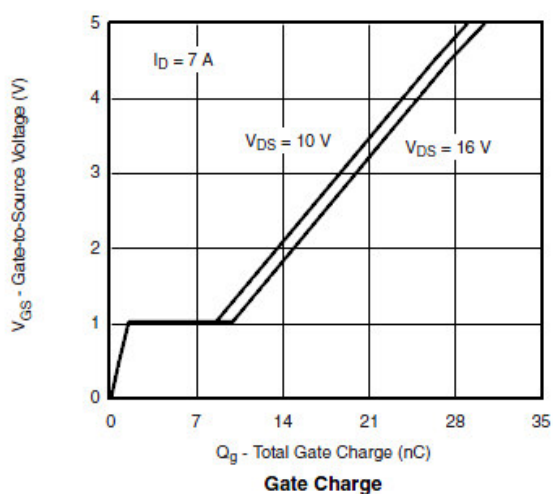
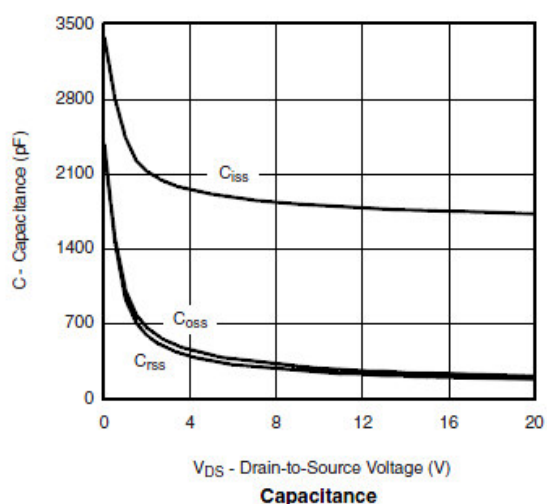
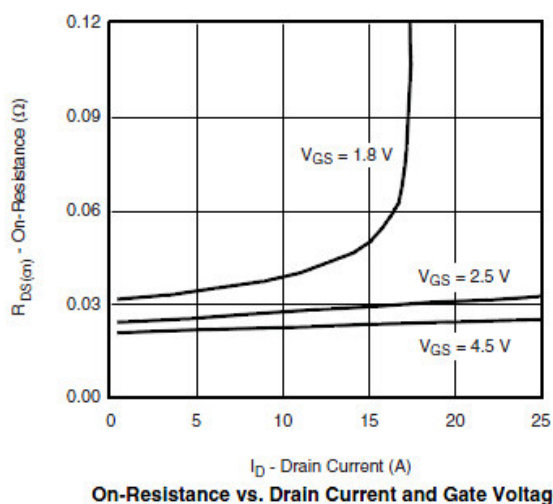
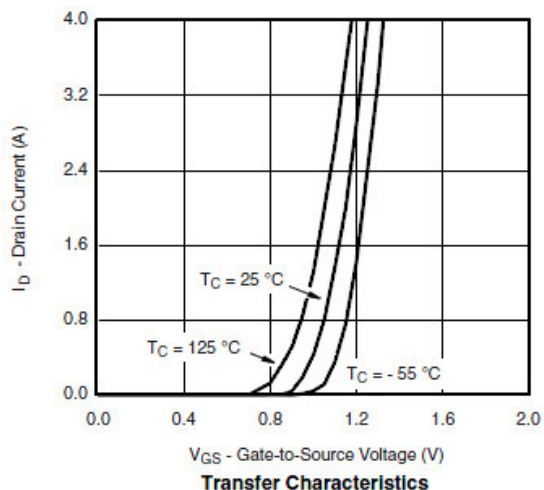
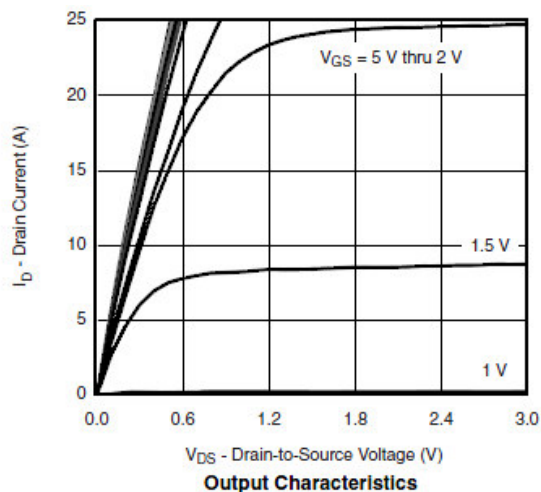
### Electrical Characteristics

(T<sub>A</sub>=25°C Unless otherwise noted)

| Parameter                       | Symbol               | Conditions                                                                                                          | Min. | Typ   | Max. | Unit |
|---------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------|------|-------|------|------|
| <b>Static</b>                   |                      |                                                                                                                     |      |       |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA                                                                         | -20  |       |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA                                                           | -0.3 |       | -0.9 |      |
| Gate Leakage Current            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V                                                                          |      |       | ±100 | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V                                                                          |      |       | -1   | uA   |
|                                 |                      | V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V<br>T <sub>J</sub> =85°C                                                  |      |       | -10  |      |
| On-State Drain Current          | I <sub>D(on)</sub>   | V <sub>DS</sub> ≥ -5V, V <sub>GS</sub> =-4.5V                                                                       | -25  |       |      | A    |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-7.3A                                                                       |      | 20    | 28   | mΩ   |
|                                 |                      | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4.0A                                                                       |      | 22    | 32   |      |
|                                 |                      | V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.2A                                                                       |      | 26    | 36   |      |
| Forward Transconductance        | g <sub>FS</sub>      | V <sub>DS</sub> =-10V, I <sub>D</sub> =-7.0A                                                                        |      | 24    |      | S    |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V                                                                          |      | -0.75 | -1.3 | V    |
| <b>Dynamic</b>                  |                      |                                                                                                                     |      |       |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V<br>I <sub>D</sub> ≡-7.0A                                              |      | 25    | 40   | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |                                                                                                                     |      | 1.6   |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |                                                                                                                     |      | 7.2   |      |      |
| Input Capacitance               | C <sub>iss</sub>     | V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V<br>f=1MHz                                                                |      | 1800  |      | pF   |
| Output Capacitance              | C <sub>oss</sub>     |                                                                                                                     |      | 290   |      |      |
| Reverse Transfer Capacitance    | C <sub>rss</sub>     |                                                                                                                     |      | 250   |      |      |
| Turn-On Time                    | t <sub>d(on)</sub>   | V <sub>DD</sub> =-10V, R <sub>L</sub> =2.0Ω<br>I <sub>D</sub> ≡-5.0A, V <sub>GEN</sub> =-4.5V<br>R <sub>G</sub> =1Ω |      | 25    | 50   | us   |
|                                 | t <sub>r</sub>       |                                                                                                                     |      | 75    | 145  |      |
| Turn-Off Time                   | t <sub>d(off)</sub>  |                                                                                                                     |      | 75    | 145  |      |
|                                 | t <sub>f</sub>       |                                                                                                                     |      | 85    | 160  |      |

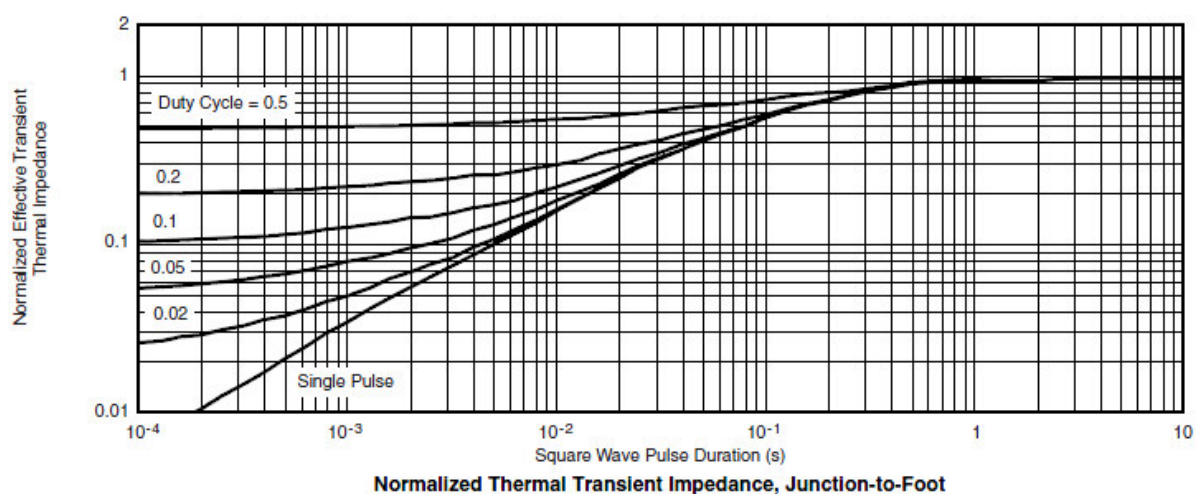
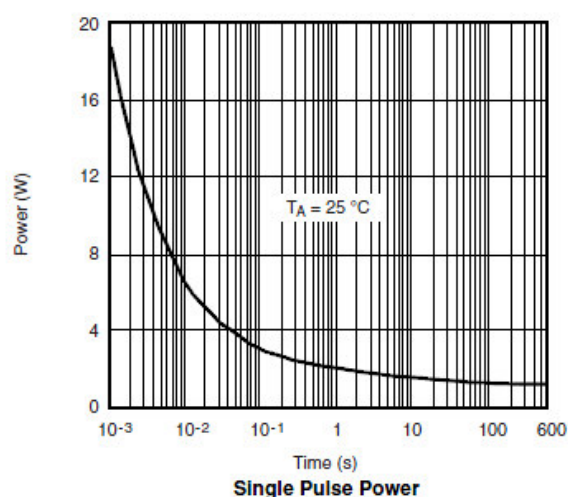
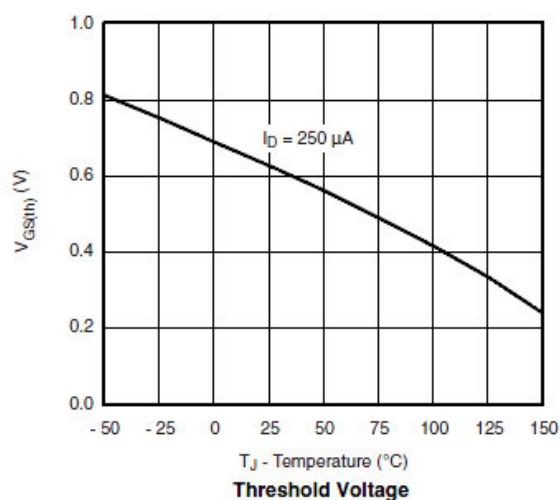
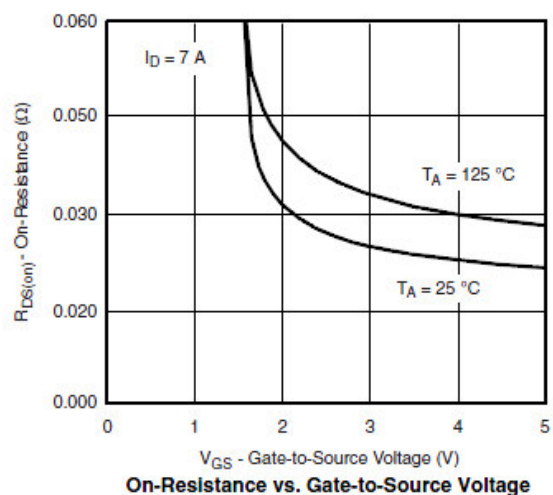
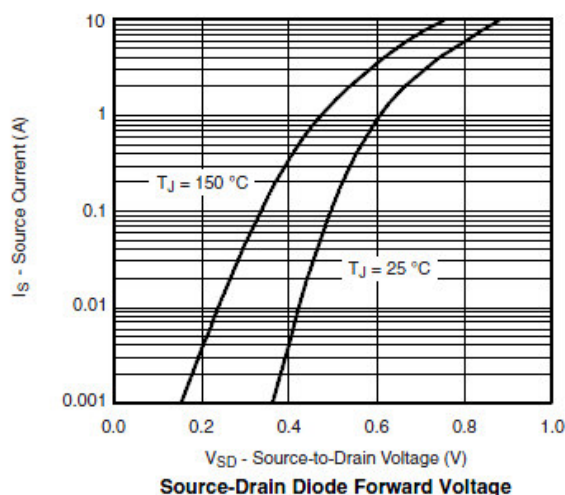


### Typical Characteristics





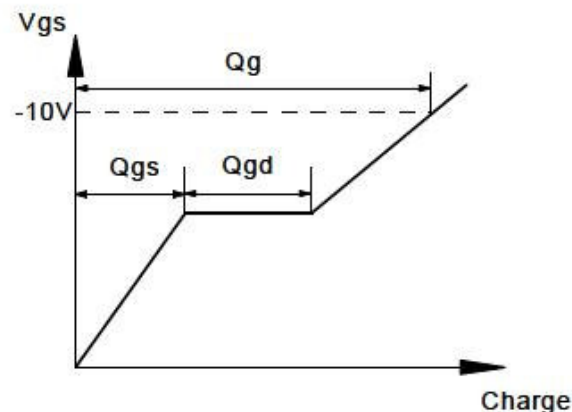
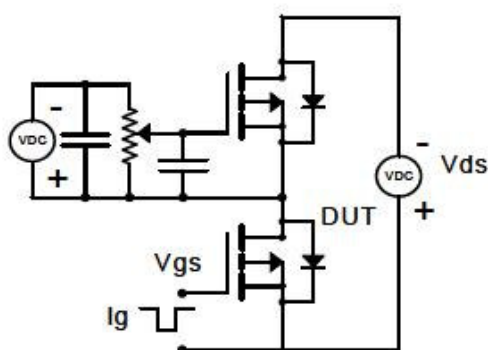
### Typical Characteristics



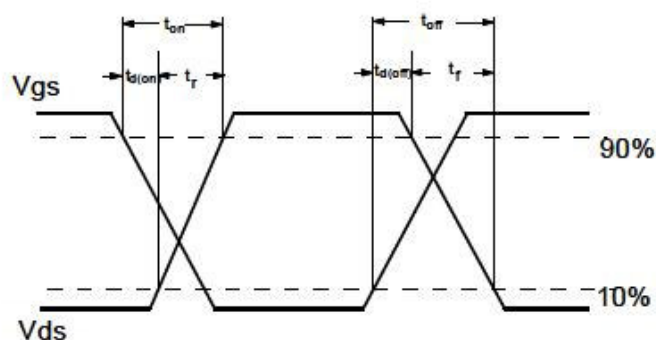
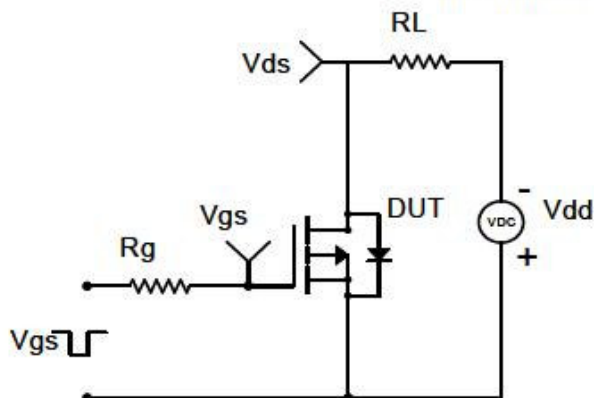


### Typical Characteristics

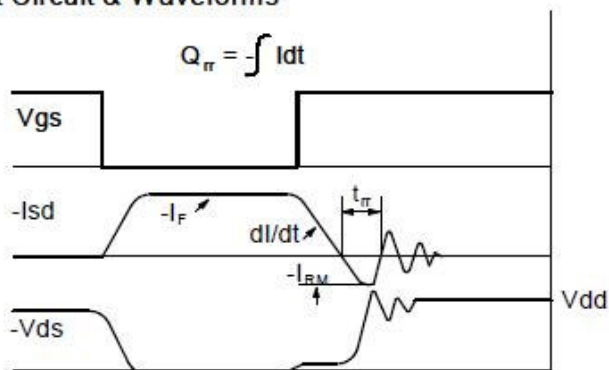
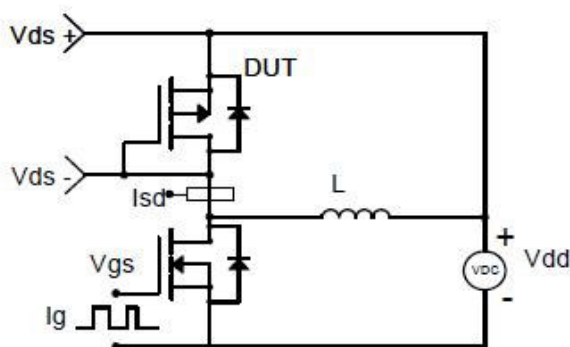
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

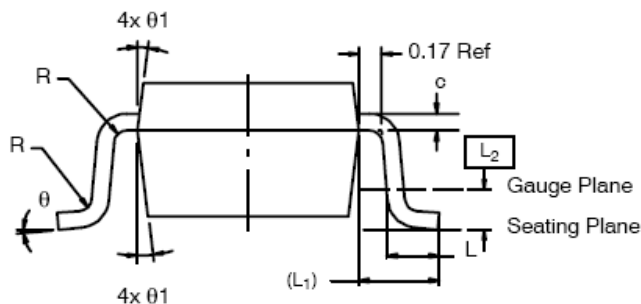
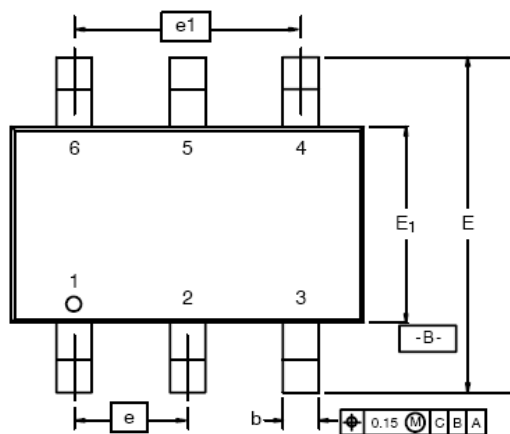


Diode Recovery Test Circuit & Waveforms





## Package Information ( TSOP-6 )



| Dim            | MILLIMETERS |      |      | INCHES     |       |       |
|----------------|-------------|------|------|------------|-------|-------|
|                | Min         | Nom  | Max  | Min        | Nom   | Max   |
| A              | 0.91        | -    | 1.10 | 0.036      | -     | 0.043 |
| A <sub>1</sub> | 0.01        | -    | 0.10 | 0.0004     | -     | 0.004 |
| A <sub>2</sub> | 0.90        | -    | 1.00 | 0.035      | 0.038 | 0.039 |
| b              | 0.30        | 0.32 | 0.45 | 0.012      | 0.013 | 0.018 |
| c              | 0.10        | 0.15 | 0.20 | 0.004      | 0.006 | 0.008 |
| D              | 2.95        | 3.05 | 3.10 | 0.116      | 0.120 | 0.122 |
| E              | 2.70        | 2.85 | 2.96 | 0.106      | 0.112 | 0.117 |
| E <sub>1</sub> | 1.55        | 1.65 | 1.70 | 0.061      | 0.065 | 0.067 |
| e              | 1.00 BSC    |      |      | 0.0394 BSC |       |       |
| e <sub>1</sub> | 1.90        | 2.00 | 2.10 | 0.075      | 0.080 | 0.085 |
| L              | 0.35        | -    | 0.50 | 0.014      | -     | 0.020 |
| L <sub>1</sub> | 0.60 Ref    |      |      | 0.024 Ref  |       |       |
| L <sub>2</sub> | 0.25 BSC    |      |      | 0.010 BSC  |       |       |
| R              | 0.10        | -    | -    | 0.004      | -     | -     |
| θ              | 0°          | 4°   | 8°   | 0°         | 4°    | 8°    |
| θ <sub>1</sub> | 7° Nom      |      |      | 7° Nom     |       |       |

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