

Snubberless 3 Quadrants Standard TRIAC

FEATURES

- ❑ Repetitive Peak Off-State Voltage : 600V/800V
- ❑ R.M.S On-State Current ($I_{T(RMS)}$) = 6A
- ❑ Gate Trigger Current : 35mA
- ❑ High commutation capability.

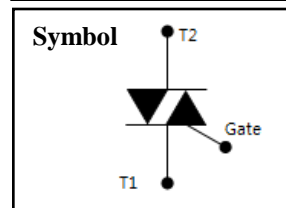
Applications

General purpose of AC switching, heating control, motor control, etc

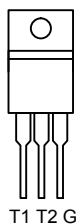
General Description

Din-Tek's standard TRIAC product is a glass passivated device, has a high commutative performance, stable gate triggering level to temperature and high off state voltage. It is generally suitable for power and phase control in ac application

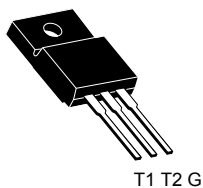
| |
|-----------------------|
| $V_{DRM} = 600V/800V$ |
| $I_{T(RMS)} = 6 A$ |
| $I_{TSM} = 63 A$ |
| $I_{GT} = 25mA$ |



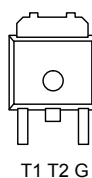
TO-220AB



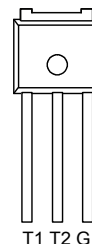
TO-220 FULLPAK



TO-252



TO-251



Absolute Maximum Ratings

($T_J=25^{\circ}C$ unless otherwise specified)

| Symbol | Parameter | Conditions | Ratings | | Unit |
|--------------|--|---|----------|----------|------------------|
| | | | DTJ6A60M | DTJ6A80M | |
| V_{DRM} | Repetitive Peak Off-State Voltage | Sine wave, 50/60Hz, Gate open | 600 | 800 | V |
| V_{RRM} | Repetitive Peak Reverse Voltage | | 600 | 800 | V |
| $I_{T(AV)}$ | Average On-State Current | Full sine wave, $T_C = 97.6^{\circ}C$ | 5.4 | | A |
| $I_{T(RMS)}$ | R.M.S. On-State Current | | 6 | | A |
| I_{TSM} | Surge On-State Current | ½ cycle, 50Hz/60Hz, Sine wave, Non repetitive | 60/63 | | A |
| I^2t | Fusing Current | $t = 10ms$ | 18 | | A ² S |
| P_{GM} | Forward Peak Gate Power Dissipation | $T_J = 125^{\circ}C$ | 5 | | W |
| $P_{G(AV)}$ | Forward Average Gate Power Dissipation | $T_J = 125^{\circ}C$, over any 20ms | 0.5 | | W |
| I_{FGM} | Forward Peak Gate Current | $T_J = 125^{\circ}C$, pulse width $\leq 20\mu s$ | 2 | | A |
| V_{RGM} | Reverse Peak Gate Voltage | $T_J = 125^{\circ}C$, pulse width $\leq 20\mu s$ | 10 | | V |
| T_J | Operating Junction Temperature | | -40~+150 | | $^{\circ}C$ |
| T_{STG} | Storage Temperature | | -40~+150 | | $^{\circ}C$ |

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit | |
|------------------|--|--|-------------------------|-----|-----|------|------------------------|
| I_{DRM} | Repetitive Peak Off-State Current | $V_D = V_{\text{DRM}}$ | $T_J=25^\circ\text{C}$ | - | - | 50 | μA |
| | | | $T_J=125^\circ\text{C}$ | - | - | 2 | mA |
| I_{RRM} | Repetitive Peak Reverse Current | $V_D = V_{\text{DRM}}$ | $T_J=25^\circ\text{C}$ | - | - | 50 | μA |
| | | | $T_J=125^\circ\text{C}$ | - | - | 2 | mA |
| I_{GT} | Gate Trigger Current | $V_D = 12\text{V}, R_L=330\Omega$ | 1+, 1-, 3- | - | - | 35 | mA |
| V_{GT} | Gate Trigger Voltage | $V_D = 12\text{V}, R_L=330\Omega$ | 1+, 1-, 3- | - | - | 2.0 | V |
| V_{GD} | Non-Trigger Gate Voltage ¹ | $V_D = 12\text{V}, R_L=330\Omega, T_J=125^\circ\text{C}$ | | 0.2 | - | - | V |
| V_{TM} | Peak On-State Voltage | $I_T = 8.5\text{A}, I_G = 20\text{mA}$ | | - | 1.2 | 1.6 | V |
| dv/dt | Critical Rate of Rise of Off-State Voltage | $V_D = 2/3 V_{\text{DRM}}, T_J=125^\circ\text{C}$ | | 200 | - | - | $\text{V}/\mu\text{s}$ |
| I_{H} | Holding current | $I_T = 0.2\text{A}$ | | - | 40 | - | mA |

Notes :

 1. Pulse Width $\leq 1.0\text{ms}$, Duty Cycle $\leq 1\%$
Thermal Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------|--------------------|---------------------|-----|-----|-----|---------------------------|
| $R_{\theta\text{JC}}$ | Thermal Resistance | Junction to Case | | | 3.9 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta\text{JA}}$ | Thermal Resistance | Junction to Ambient | | | 58 | $^\circ\text{C}/\text{W}$ |

Typical Characteristics

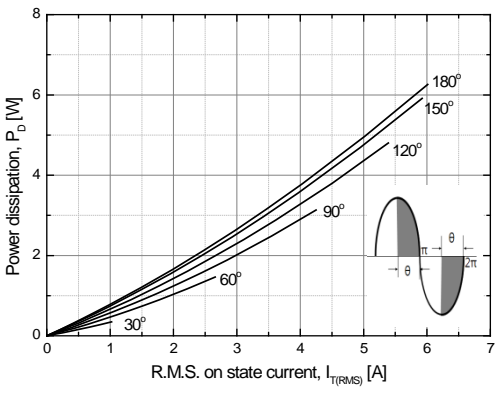


Fig 1. R.M.S. current vs. Power dissipation

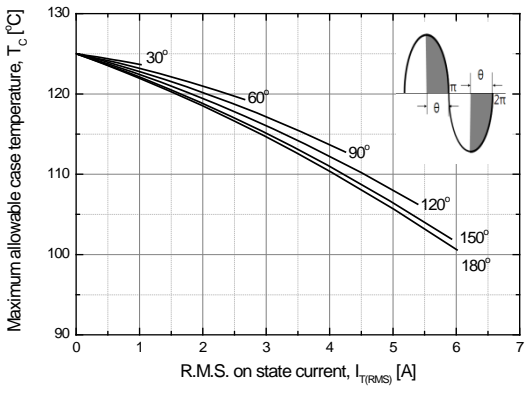


Fig 2. R.M.S. current vs. Case temperature

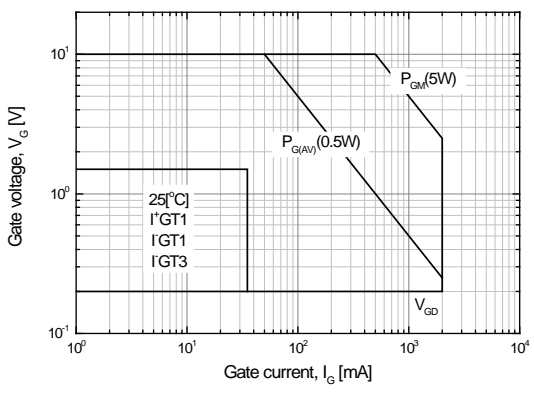


Fig 3. Gate power characteristics

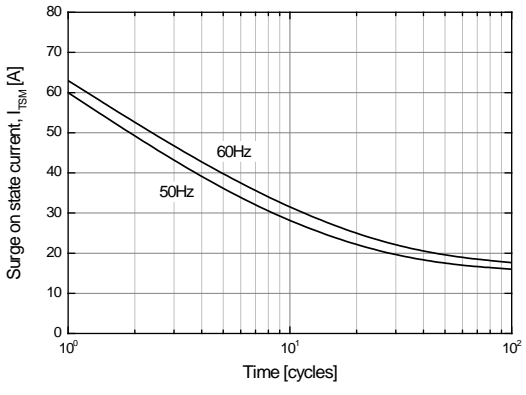


Fig 4. Surge on state current rating (Non-repetitive)

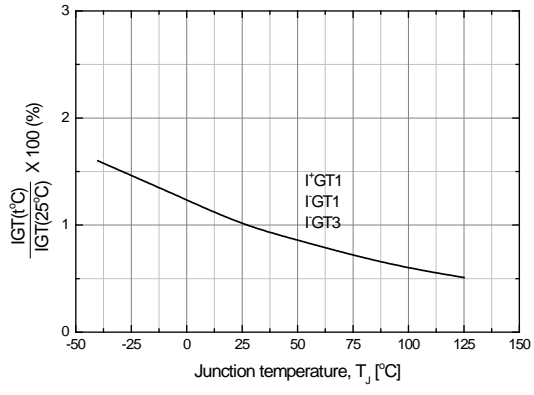


Fig 5. Gate trigger current vs. junction temperature

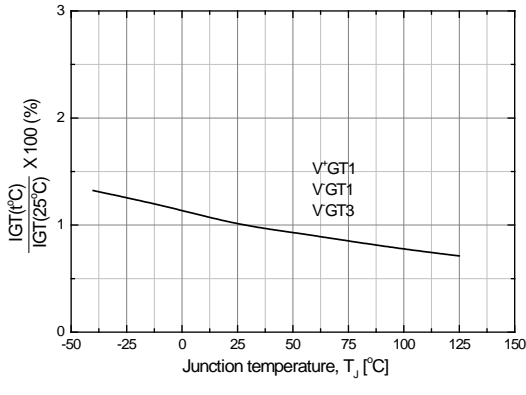


Fig 6. Gate trigger voltage vs. junction temperature

Typical Characteristics

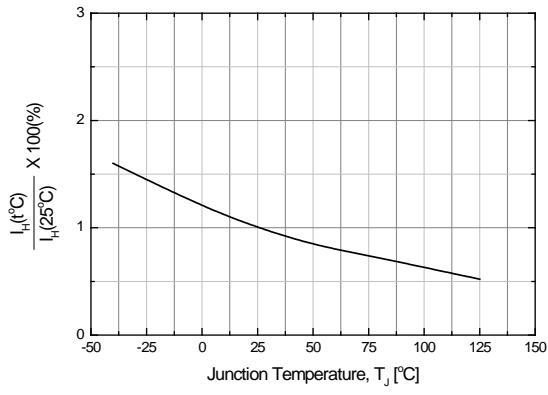


Fig 7. Holding current vs. Junction temperature

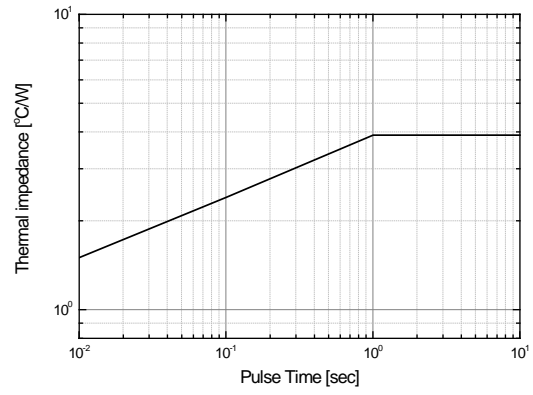


Fig 8. Thermal Impedance vs. pulse time

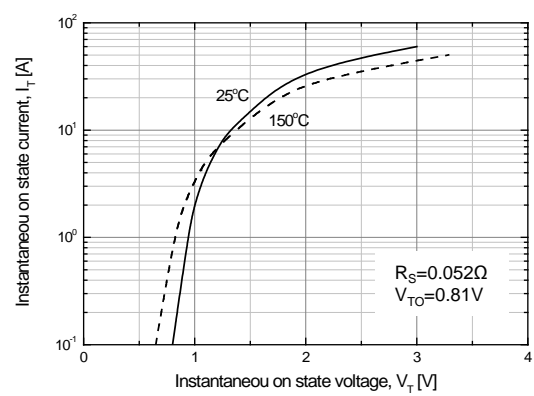


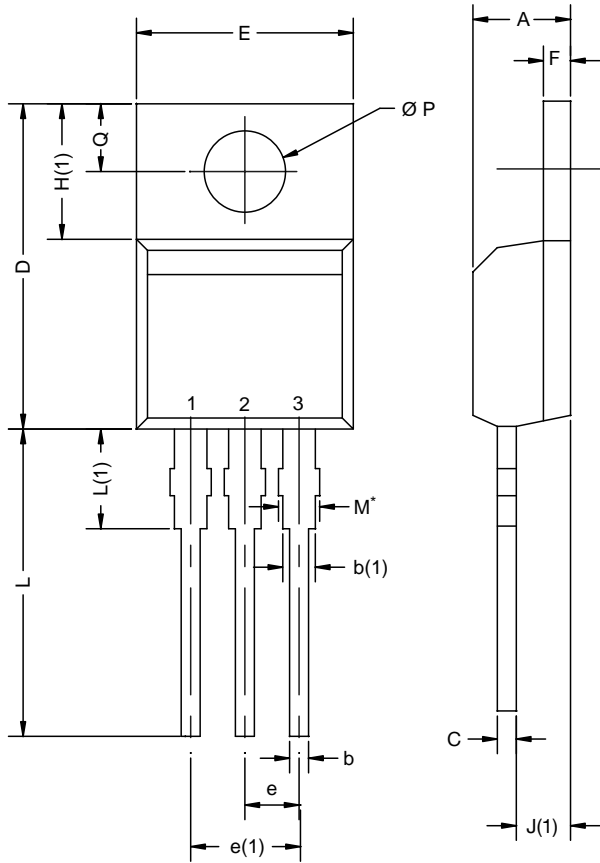
Fig 9. Instantaneous on state current vs. Instantaneous on state voltage

Measurement of gate trigger current

(1) Quadrant I (2) Quadrant II (3) Quadrant III (4) Quadrant IV

Note. Whole parameter and test condition can not be over absolute maximum ratings in this datasheet.

TO-220AB



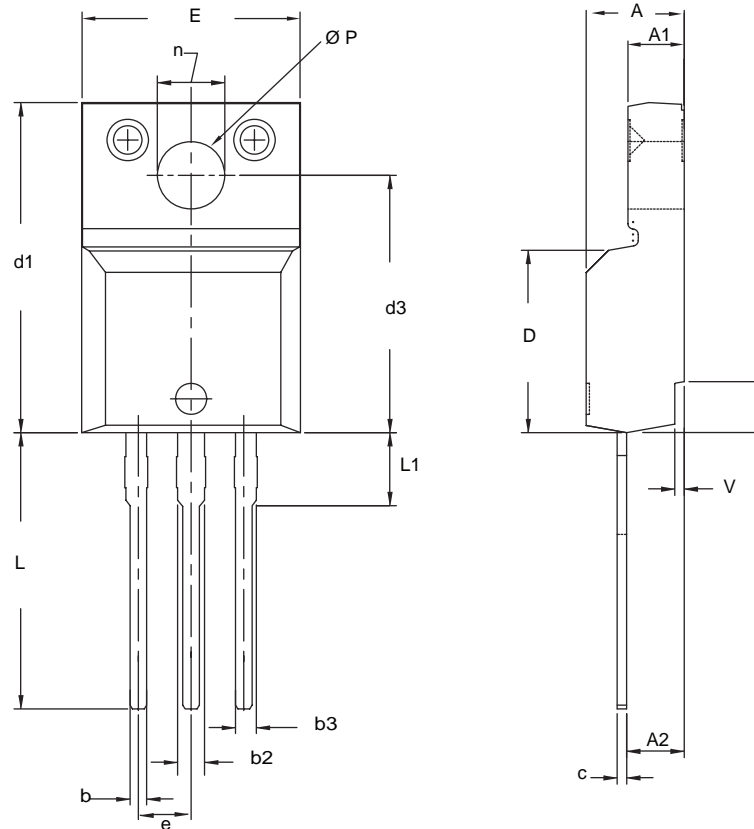
| DIM. | MILLIMETERS | | INCHES | |
|-----------------|-------------|-------|--------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 4.25 | 4.65 | 0.167 | 0.183 |
| b | 0.69 | 1.01 | 0.027 | 0.040 |
| b(1) | 1.20 | 1.73 | 0.047 | 0.068 |
| c | 0.36 | 0.61 | 0.014 | 0.024 |
| D | 14.85 | 15.49 | 0.585 | 0.610 |
| E | 10.04 | 10.51 | 0.395 | 0.414 |
| e | 2.41 | 2.67 | 0.095 | 0.105 |
| e(1) | 4.88 | 5.28 | 0.192 | 0.208 |
| F | 1.14 | 1.40 | 0.045 | 0.055 |
| H(1) | 6.09 | 6.48 | 0.240 | 0.255 |
| J(1) | 2.41 | 2.92 | 0.095 | 0.115 |
| L | 13.35 | 14.02 | 0.526 | 0.552 |
| L(1) | 3.32 | 3.82 | 0.131 | 0.150 |
| $\varnothing P$ | 3.54 | 3.94 | 0.139 | 0.155 |
| Q | 2.60 | 3.00 | 0.102 | 0.118 |

ECN: X12-0208-Rev. N, 08-Oct-12
DWG: 5471

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion)
Heatsink hole for HVM

TO-220 FULLPAK (HIGH VOLTAGE)



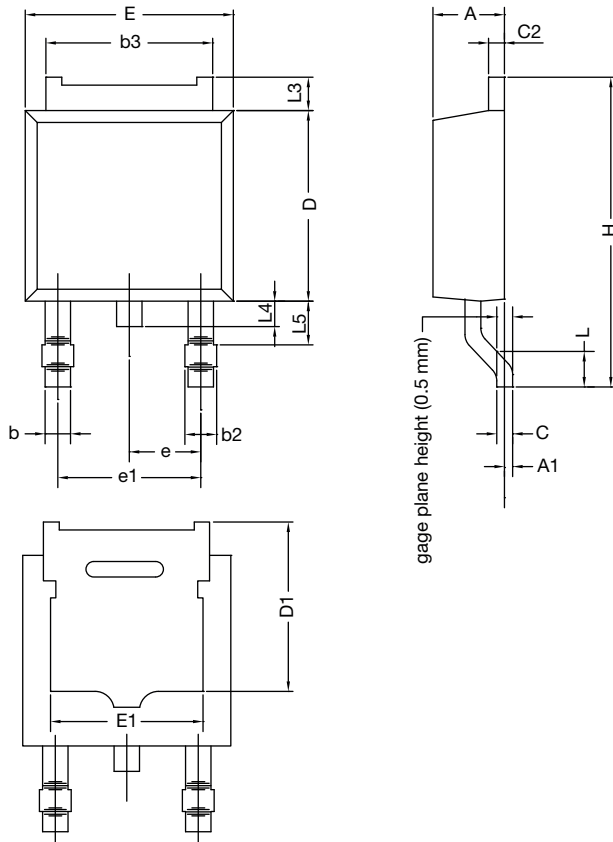
| DIM. | MILLIMETERS | | INCHES | |
|-----------------|-------------|--------|-----------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 4.570 | 4.830 | 0.180 | 0.190 |
| A1 | 2.570 | 2.830 | 0.101 | 0.111 |
| A2 | 2.510 | 2.850 | 0.099 | 0.112 |
| b | 0.622 | 0.890 | 0.024 | 0.035 |
| b2 | 1.229 | 1.400 | 0.048 | 0.055 |
| b3 | 1.229 | 1.400 | 0.048 | 0.055 |
| c | 0.440 | 0.629 | 0.017 | 0.025 |
| D | 8.650 | 9.800 | 0.341 | 0.386 |
| d1 | 15.88 | 16.120 | 0.622 | 0.635 |
| d3 | 12.300 | 12.920 | 0.484 | 0.509 |
| E | 10.360 | 10.630 | 0.408 | 0.419 |
| e | 2.54 BSC | | 0.100 BSC | |
| L | 13.200 | 13.730 | 0.520 | 0.541 |
| L1 | 3.100 | 3.500 | 0.122 | 0.138 |
| n | 6.050 | 6.150 | 0.238 | 0.242 |
| $\varnothing P$ | 3.050 | 3.450 | 0.120 | 0.136 |
| u | 2.400 | 2.500 | 0.094 | 0.098 |
| v | 0.400 | 0.500 | 0.016 | 0.020 |

ECN: X09-0126-Rev. B, 26-Oct-09
DWG: 5972

Notes

1. To be used only for process drawing.
2. These dimensions apply to all TO-220, FULLPAK leadframe versions 3 leads.
3. All critical dimensions should C meet $C_{pk} > 1.33$.
4. All dimensions include burrs and plating thickness.
5. No chipping or package damage.

TO-252AA CASE OUTLINE

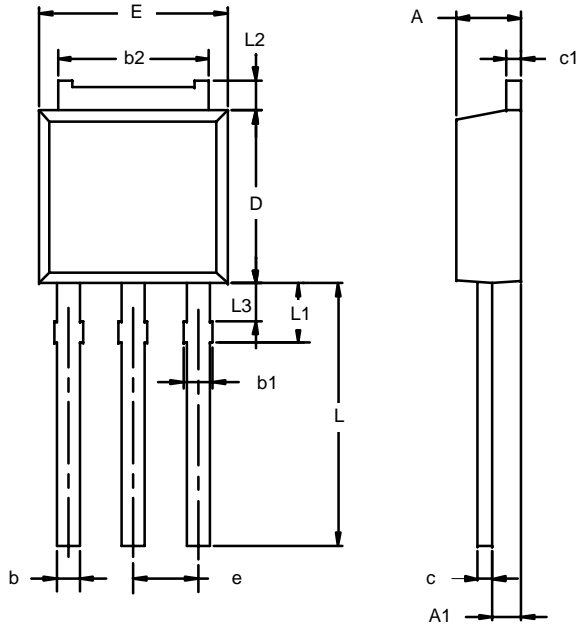


| DIM. | MILLIMETERS | | INCHES | |
|---------------------------------|-------------|-------|-----------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 2.18 | 2.38 | 0.086 | 0.094 |
| A1 | - | 0.127 | - | 0.005 |
| b | 0.64 | 0.88 | 0.025 | 0.035 |
| b2 | 0.76 | 1.14 | 0.030 | 0.045 |
| b3 | 4.95 | 5.46 | 0.195 | 0.215 |
| C | 0.46 | 0.61 | 0.018 | 0.024 |
| C2 | 0.46 | 0.89 | 0.018 | 0.035 |
| D | 5.97 | 6.22 | 0.235 | 0.245 |
| D1 | 5.21 | - | 0.205 | - |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 4.32 | - | 0.170 | - |
| H | 9.40 | 10.41 | 0.370 | 0.410 |
| e | 2.28 BSC | | 0.090 BSC | |
| e1 | 4.56 BSC | | 0.180 BSC | |
| L | 1.40 | 1.78 | 0.055 | 0.070 |
| L3 | 0.89 | 1.27 | 0.035 | 0.050 |
| L4 | - | 1.02 | - | 0.040 |
| L5 | 1.14 | 1.52 | 0.045 | 0.060 |
| ECN: X12-0247-Rev. M, 24-Dec-12 | | | | |
| DWG: 5347 | | | | |

Note

- Dimension L3 is for reference only.

TO-251AA (DPAK)



Note: Dimension L3 is for reference only.

| Dim | MILLIMETERS | | INCHES | |
|---|-------------|------|-----------|-------|
| | Min | Max | Min | Max |
| A | 2.21 | 2.38 | 0.087 | 0.094 |
| A1 | 0.89 | 1.14 | 0.035 | 0.045 |
| b | 0.71 | 0.89 | 0.028 | 0.035 |
| b1 | 0.76 | 1.14 | 0.030 | 0.045 |
| b2 | 5.23 | 5.43 | 0.206 | 0.214 |
| c | 0.46 | 0.58 | 0.018 | 0.023 |
| c1 | 0.46 | 0.58 | 0.018 | 0.023 |
| D | 5.97 | 6.22 | 0.235 | 0.245 |
| E | 6.48 | 6.73 | 0.255 | 0.265 |
| e | 2.28 BSC | | 0.090 BSC | |
| L | 8.89 | 9.53 | 0.350 | 0.375 |
| L1 | 1.91 | 2.28 | 0.075 | 0.090 |
| L2 | 0.89 | 1.27 | 0.035 | 0.050 |
| L3 | 1.15 | 1.52 | 0.045 | 0.060 |
| ECN: S-03946—Rev. E, 09-Jul-01 DWG: 5346 | | | | |

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