



THE DATASHEET OF STD1805-1





STD1805

LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

| Ordering Code | Marking | Shipment |
|---------------|---------|-------------|
| STD1805T4 | D1805 | Tape & Reel |
| STD1805-1 | D1805 | Tube |

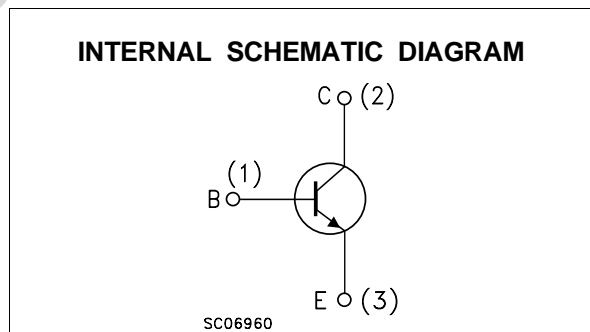
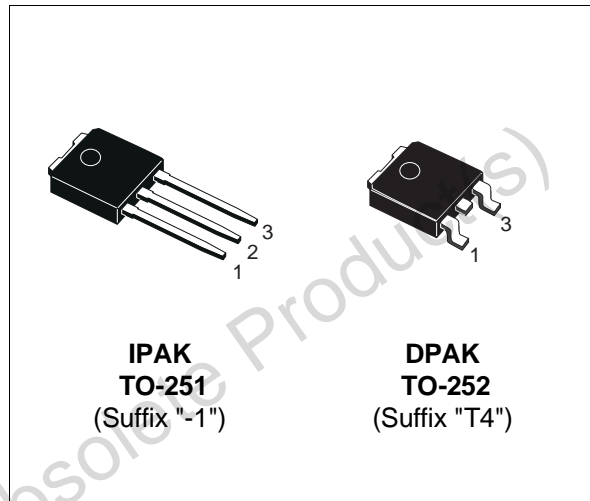
- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (Suffix "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (Suffix "T4")

APPLICATIONS:

- CCFL DRIVERS
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING APPLICATIONS

DESCRIPTION

The device is manufactured in NPN Planar Technology by using a "Base Island" layout. The resulting Transistor shows exceptional high gain performance coupled with very low saturation voltage.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-----------|---|------------|------|
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | 150 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 60 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | 7 | V |
| I_C | Collector Current | 5 | A |
| I_{CM} | Collector Peak Current ($t_p < 5$ ms) | 10 | A |
| I_B | Base Current | 2 | A |
| P_{tot} | Total Dissipation at $T_c = 25$ °C | 15 | W |
| T_{stg} | Storage Temperature | -65 to 150 | °C |
| T_j | Max. Operating Junction Temperature | 150 | °C |

STD1805

THERMAL DATA

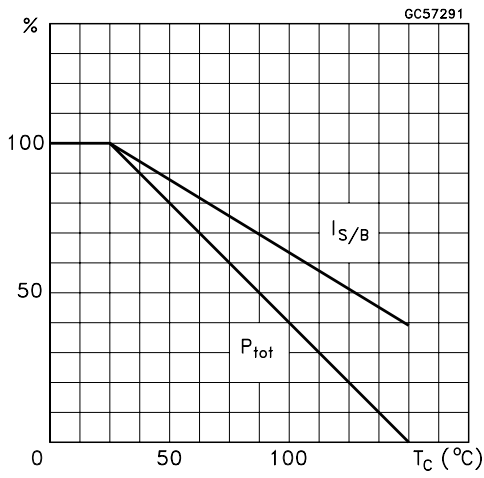
| | | | | |
|-----------------------|----------------------------------|-----|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 8.33 | °C/W |
|-----------------------|----------------------------------|-----|------|------|

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

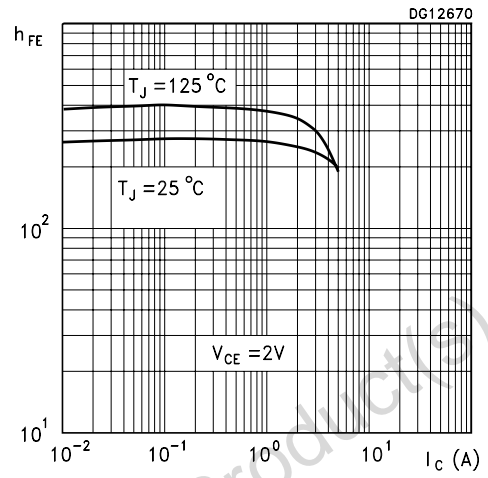
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|--|---|---|-----------------|---------------------------------------|----------------------|
| I _{CBO} | Collector Cut-off Current (I _E = 0) | V _{CB} = 40 V | | | 0.1 | μA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 4 V | | | 0.1 | μA |
| V _{(BR)CBO} | Collector-Base Breakdown Voltage (I _E = 0) | I _C = 100 μA | 150 | | | V |
| V _{(BR)CEO*} | Collector-Emitter Breakdown Voltage (I _B = 0) | I _C = 1 mA | 60 | | | V |
| V _{(BR)EBO} | Emitter-Base Breakdown Voltage (I _C = 0) | I _E = 100 μA | 7 | | | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 100 mA I _C = 2 A I _C = 3 A I _C = 5 A | I _B = 5 mA I _B = 50 mA I _B = 150 mA I _B = 200 mA | | 50 150 200 300 400 600 | mV mV mV mV |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | I _C = 2 A | I _B = 100 mA | 0.9 | 1.2 | V |
| h _{FE*} | DC Current Gain | I _C = 100 mA I _C = 5 A I _C = 10 A | V _{CE} = 2 V V _{CE} = 2 V V _{CE} = 2 V | 200 85 20 | 400 | |
| f _T | Transition frequency | V _{CE} = 10 V | I _C = 50 mA | | 150 | MHz |
| C _{CBO} | Collector-Base Capacitance | V _{CB} = 10 V | f = 1 MHz | | 50 | pF |
| t _{ON} t _s t _f | RESISTIVE LOAD Turn- on Time Storage Time Fall Time | I _C = 1 A I _{B1} = - I _{B2} = 0.1 A | V _{CC} = 30 V | | 50 1.35 120 | ns μs ns |

* Pulsed: Pulse duration = 300μs, duty cycle = 1.5 %

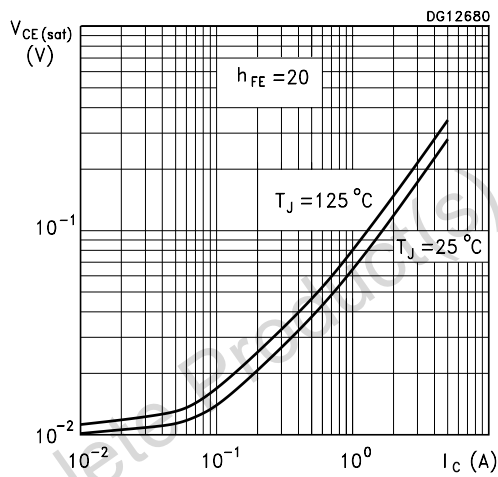
Derating Curve



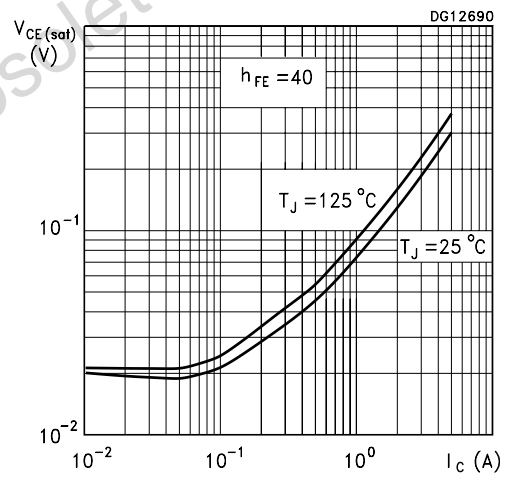
DC Current Gain



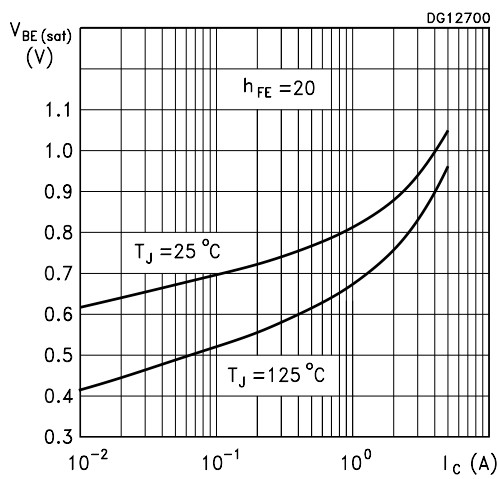
Collector-Emitter Saturation Voltage



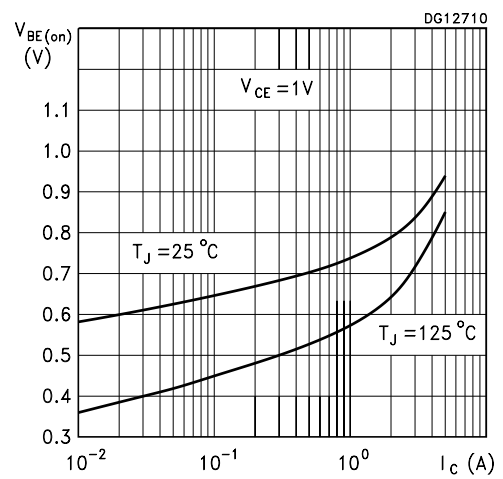
Collector-Emitter Saturation Voltage



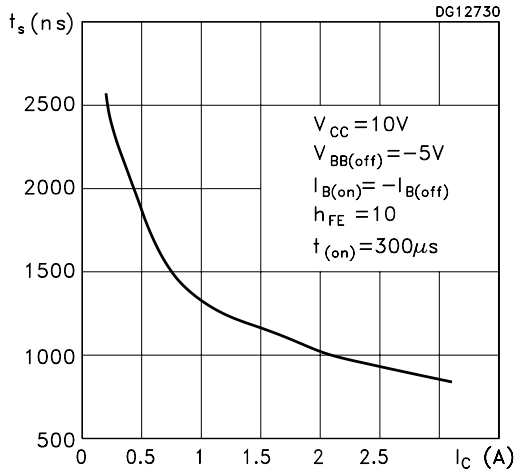
Base-Emitter Saturation Voltage



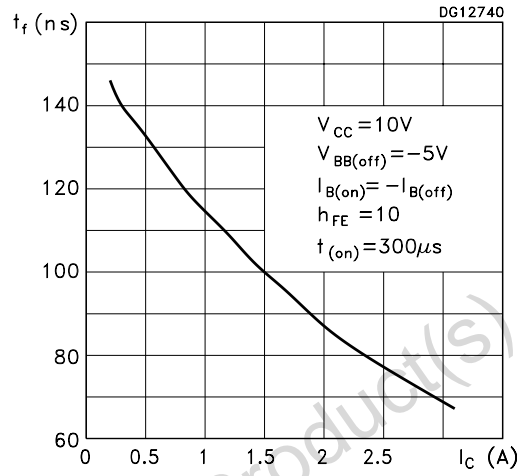
Base-Emitter On Voltage



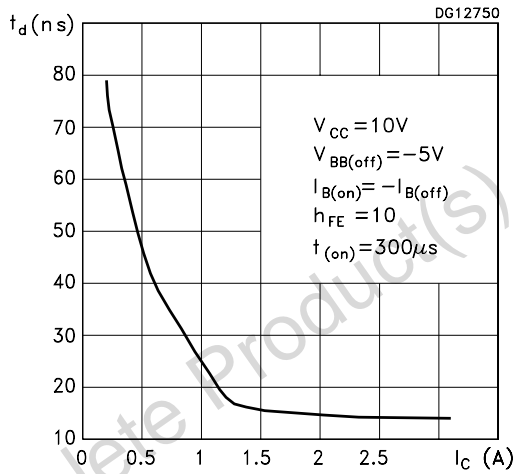
Switching Times Resistive Load



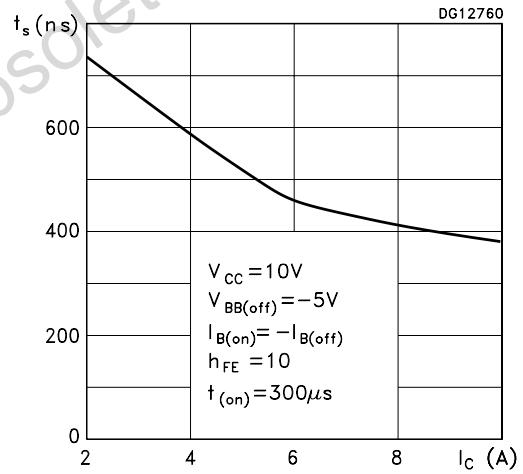
Switching Times Resistive Load



Switching Times Resistive Load



Switching Times Inductive Load



Switching Times Inductive Load

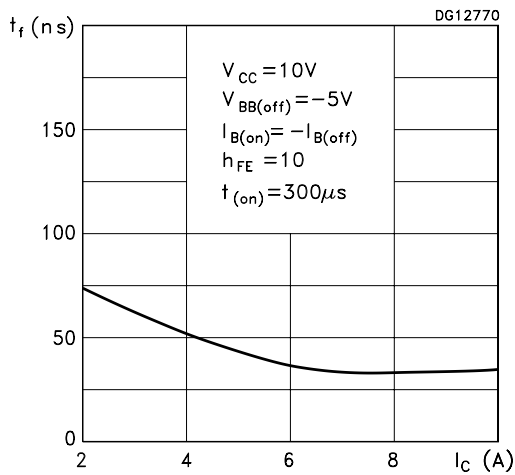
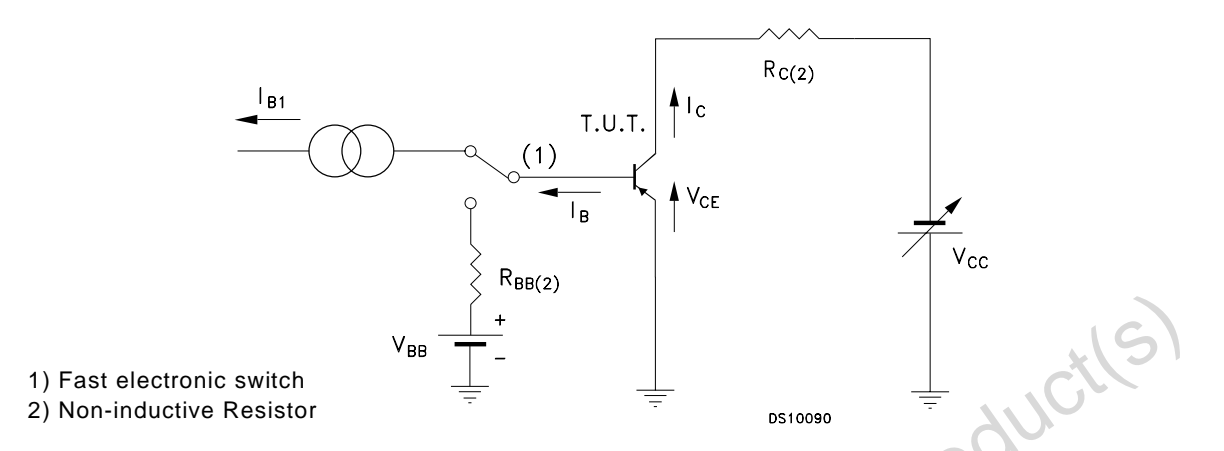


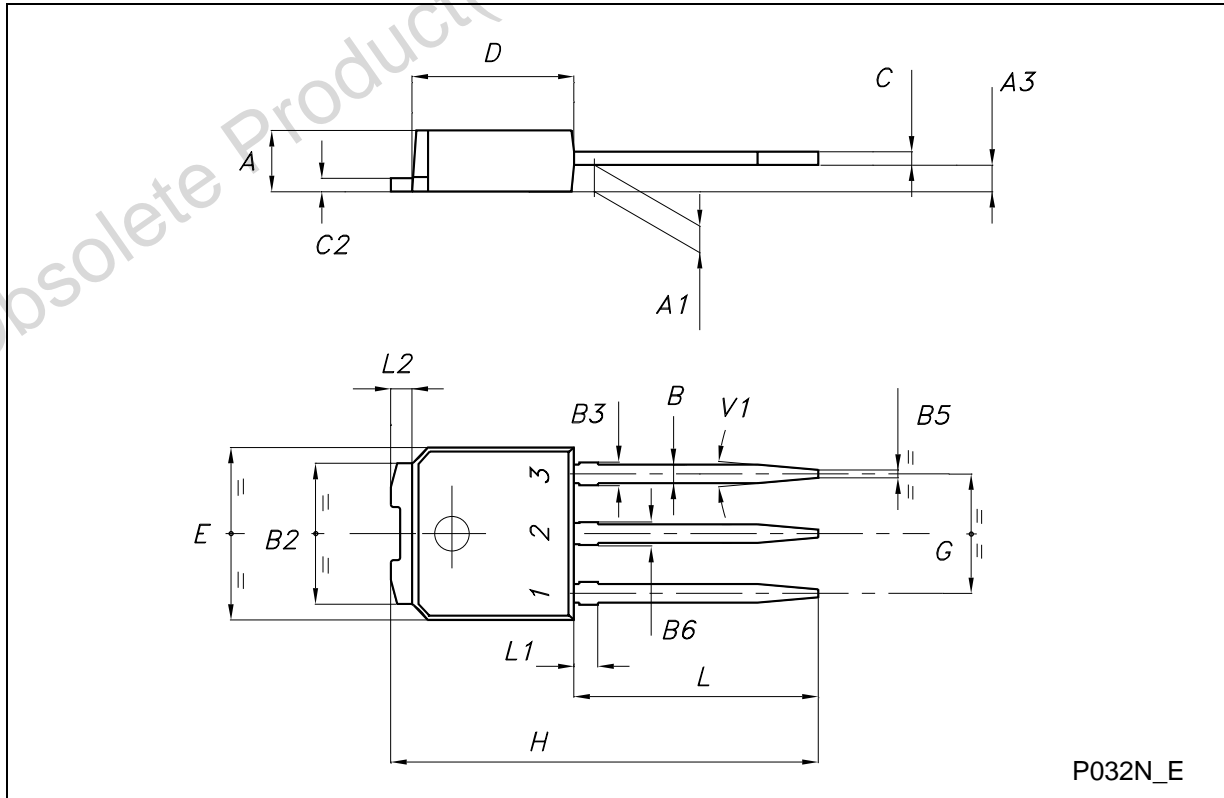
Figure 1: Resistive Load Switching Test Circuit.



Obsolete Product(s) - Obsolete Product(s)

TO-251 (IPAK) MECHANICAL DATA

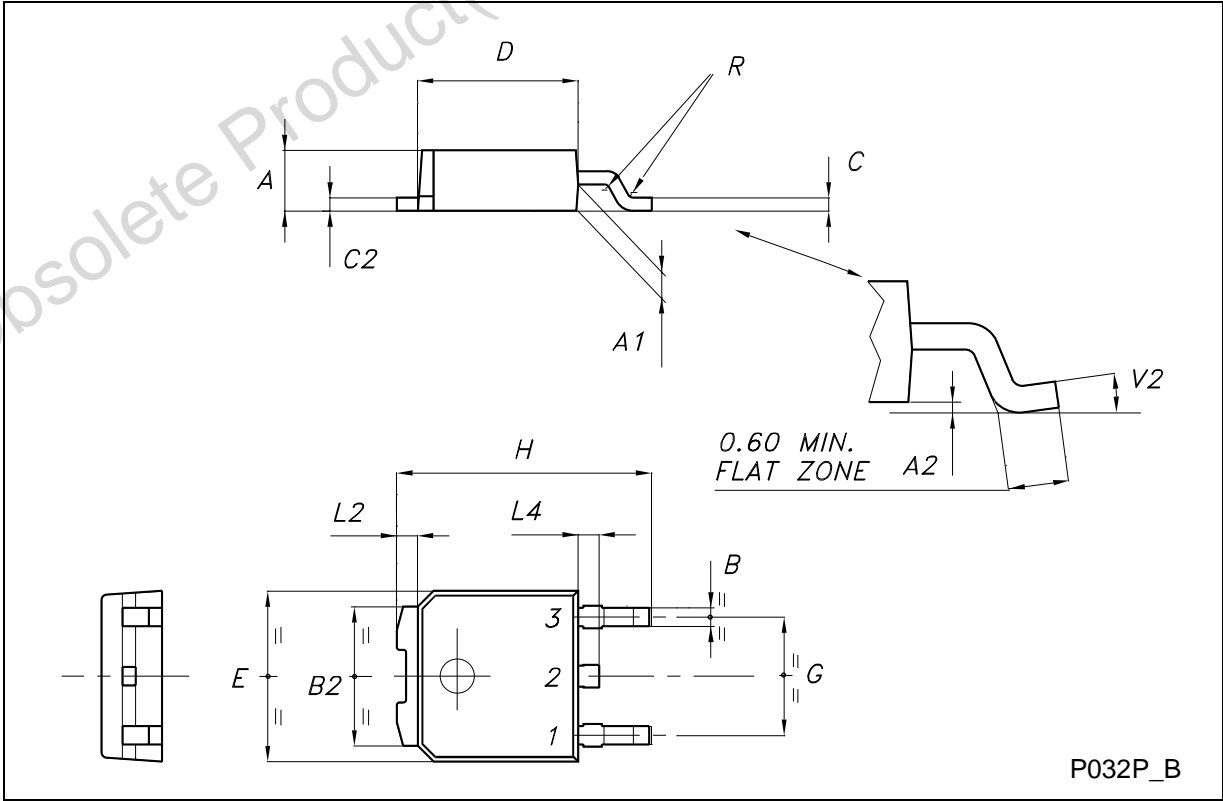
| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 2.20 | | 2.40 | 0.087 | | 0.094 |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.043 |
| A3 | 0.70 | | 1.30 | 0.028 | | 0.051 |
| B | 0.64 | | 0.90 | 0.025 | | 0.035 |
| B2 | 5.20 | | 5.40 | 0.204 | | 0.213 |
| B3 | | | 0.85 | | | 0.033 |
| B5 | | 0.30 | | | 0.012 | |
| B6 | | | 0.95 | | | 0.037 |
| C | 0.45 | | 0.60 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.60 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.237 | | 0.244 |
| E | 6.40 | | 6.60 | 0.252 | | 0.260 |
| G | 4.40 | | 4.60 | 0.173 | | 0.181 |
| H | 15.90 | | 16.30 | 0.626 | | 0.642 |
| L | 9.00 | | 9.40 | 0.354 | | 0.370 |
| L1 | 0.80 | | 1.20 | 0.031 | | 0.047 |
| L2 | | 0.80 | 1.00 | | 0.031 | 0.039 |
| V1 | | 10° | | | 10° | |



P032N_E

TO-252 (DPAK) MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 2.20 | | 2.40 | 0.087 | | 0.094 |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.043 |
| A2 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| B | 0.64 | | 0.90 | 0.025 | | 0.035 |
| B2 | 5.20 | | 5.40 | 0.204 | | 0.213 |
| C | 0.45 | | 0.60 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.60 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.60 | 0.252 | | 0.260 |
| G | 4.40 | | 4.60 | 0.173 | | 0.181 |
| H | 9.35 | | 10.10 | 0.368 | | 0.398 |
| L2 | | 0.8 | | | 0.031 | |
| L4 | 0.60 | | 1.00 | 0.024 | | 0.039 |
| V2 | 0° | | 8° | 0° | | 0° |



Obsolete Product(s) - Obsolete Product(s)

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