

GSMDD0903

100V P-Channel MOSFETs

Product Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

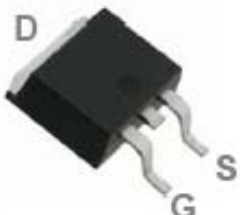
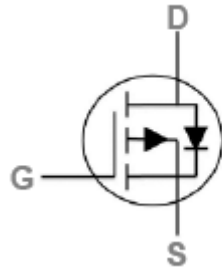
Features

- -100V, -10A, $R_{DS(ON)}=140m\Omega@V_{GS}=-10V$
- V_{GS} Guaranteed $\pm 25V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- TO-252-2L package design

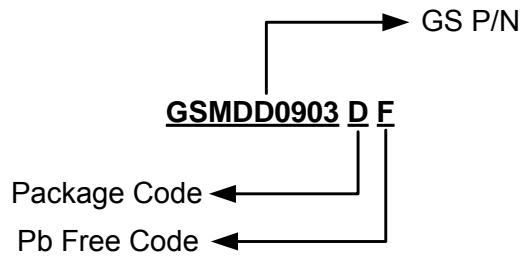
Applications

- Networking
- Load Switch
- LED applications

Packages & Pin Assignments

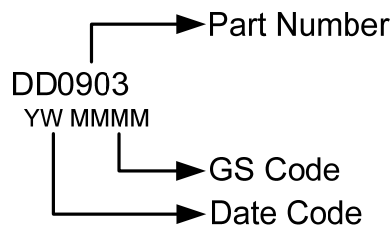
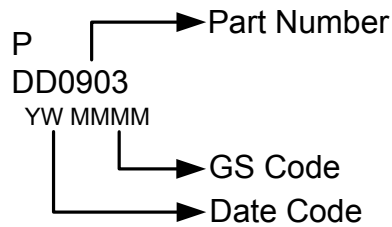
| GSMDD0903DF (TO-252-2L) | |
|---|---|
|  <p>Top View</p> |  |
| Description | |
| Gate | |
| Source | |
| Drain | |

Ordering Information



| Part Number | Package | Quantity Reel |
|-------------|-----------|---------------|
| GSMDD0903DF | TO-252-2L | 2500 PCS |

Marking Information



Absolute Maximum Ratings

T_C=25°C Unless otherwise noted

| Symbol | Parameter | Typical | Unit |
|------------------|--|-----------------------|------|
| V _{DS} | Drain-Source Voltage | -100 | V |
| V _{GS} | Gate –Source Voltage | ±25 | V |
| I _D | Continuous Drain Current | T _C =25°C | -10 |
| | | T _C =100°C | -6.5 |
| I _{DM} | Pulsed Drain Current | -40 | A |
| P _D | Power Dissipation (T _C =25°C) | 88 | W |
| | Power Dissipation (Derate above 25°C) | 0.59 | W/°C |
| T _J | Operating Junction Temperature Range | -55 to +150 | °C |
| T _{STG} | Storage Temperature Range | -55 to +150 | °C |
| R _{θJA} | Thermal Resistance-Junction to Ambient | 62 | °C/W |
| R _{θJC} | Thermal Resistance-Junction to Case | 1.7 | °C/W |

Electrical Characteristics

T_J=25°C Unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------------|---------------------------------|--|---|------|------|------|
| Static | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =-250μA | -100 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250μA | -1 | | -3 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±25V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =-100V, V _{GS} =0V | | | -1 | μA |
| | | V _{DS} =-80V, V _{GS} =0V, T _J =125°C | | | -10 | |
| I _S | Continuous Source Current | V _G =V _D =0V, Force Current | | | -10 | A |
| I _{SM} | Pulsed Source Current | | | | -20 | |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} = -10V, I _D =-6A | | 115 | 140 | mΩ |
| | | V _{GS} = -4.5V, I _D =-3A | | 130 | 170 | mΩ |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V, I _S =-1A | | | -1.2 | V |
| Dynamic | | | | | | |
| Q _g | Total Gate Charge | V _{DS} =-50V, V _{GS} =-10V, I _D =-6A | | 40.4 | 70 | nC |
| Q _{gs} | Gate-Source Charge | | | 7.7 | 15 | |
| Q _{gd} | Gate-Drain Charge | | | 6.6 | 13 | |
| C _{iss} | Input Capacitance | V _{DS} =-30V, V _{GS} =0V, f=1MHz | | 2250 | 3900 | pF |
| C _{oss} | Output Capacitance | | | 130 | 250 | |
| C _{rss} | Reverse Transfer Capacitance | | | 90 | 180 | |
| t _{d(on)} | Turn-On Time | V _{DD} =-30V, I _D =-1A, V _{GS} =-10V, R _G =6Ω | | 27 | 54 | ns |
| t _r | | | | 12 | 24 | |
| t _{d(off)} | Turn-Off Time | | | 150 | 300 | |
| t _f | | | | 45 | 90 | |
| R _g | Gate Resistance | | V _{DS} =0V, V _{GS} =0V, f=1MHz | | 10 | |

Typical Performance Characteristics

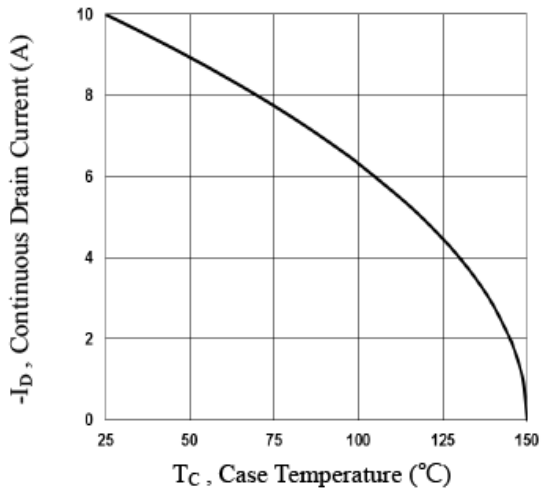


Fig.1 Continuous Drain Current vs. T_c

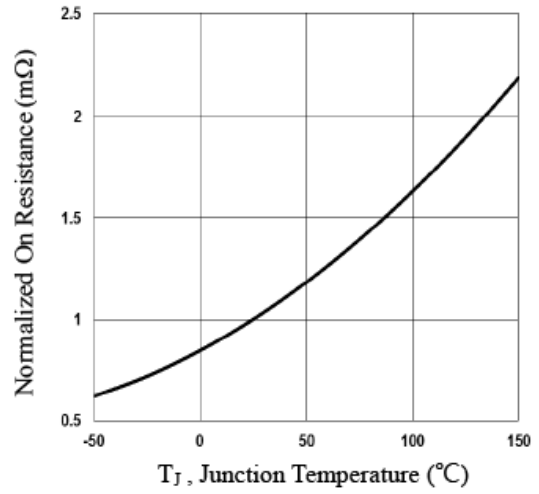


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

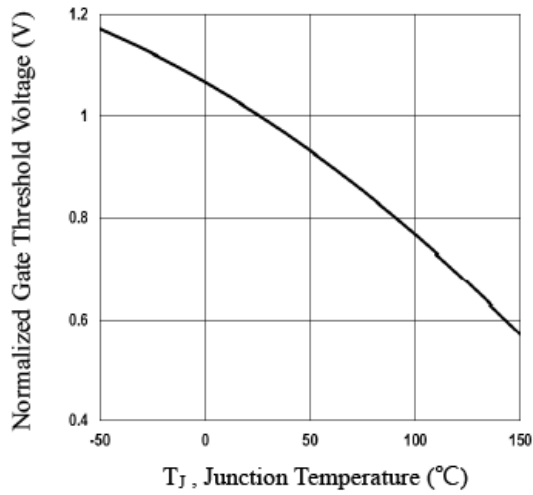


Fig.3 Normalized V_{th} vs. T_j

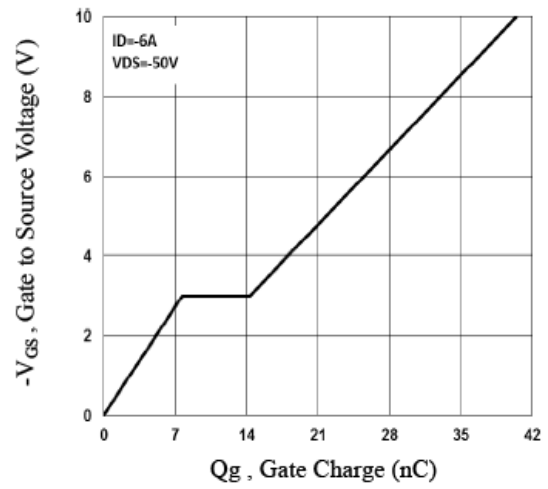


Fig.4 Gate Charge Waveform

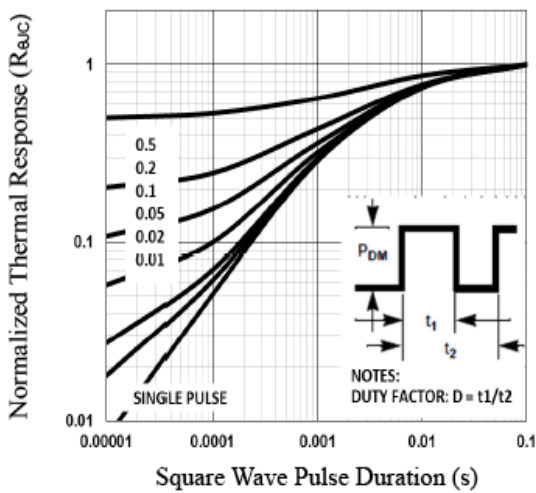


Fig.5 Normalized Transient Impedance

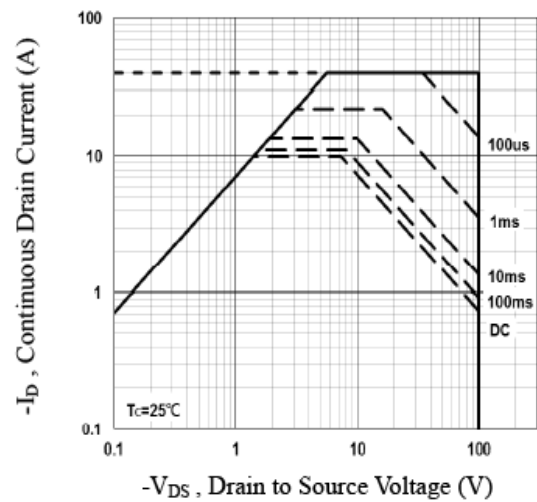
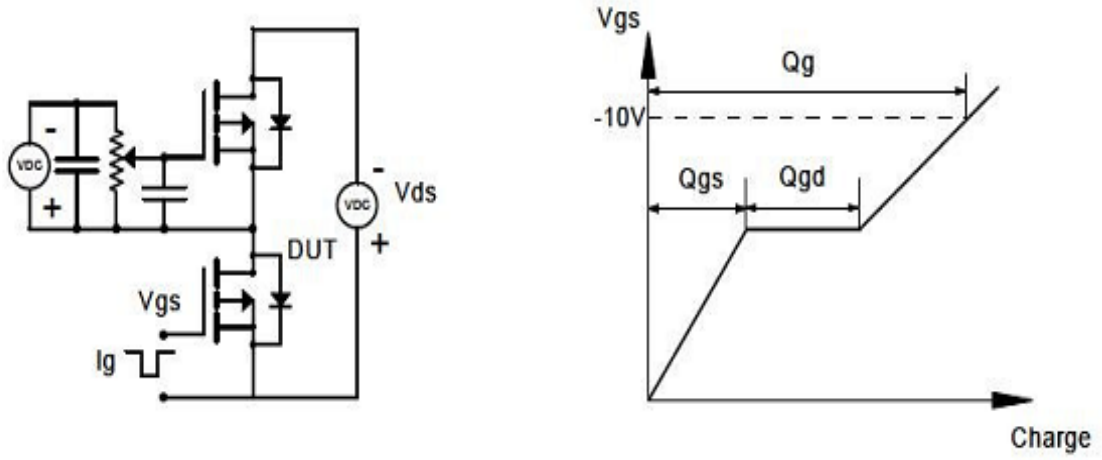


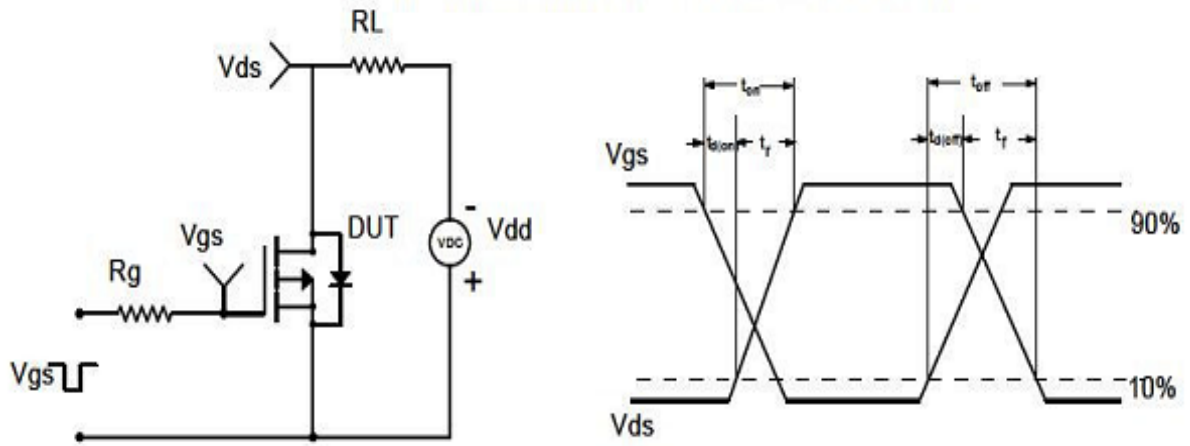
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

Gate Charge Test Circuit & Waveform

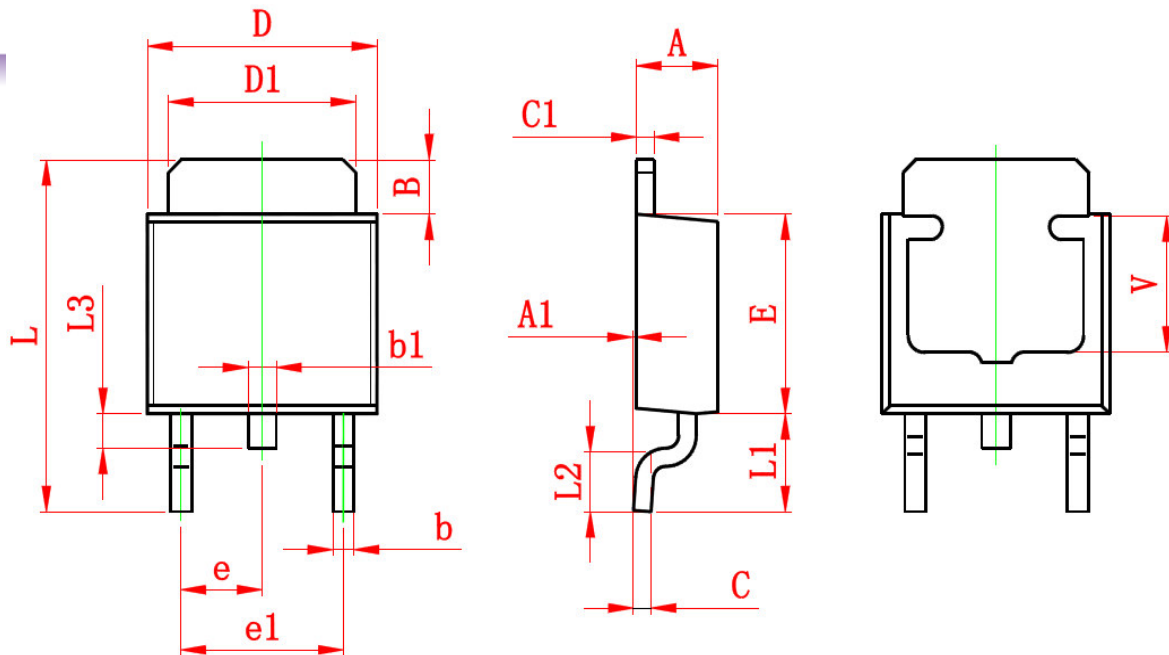


Resistive Switching Test Circuit & Waveforms



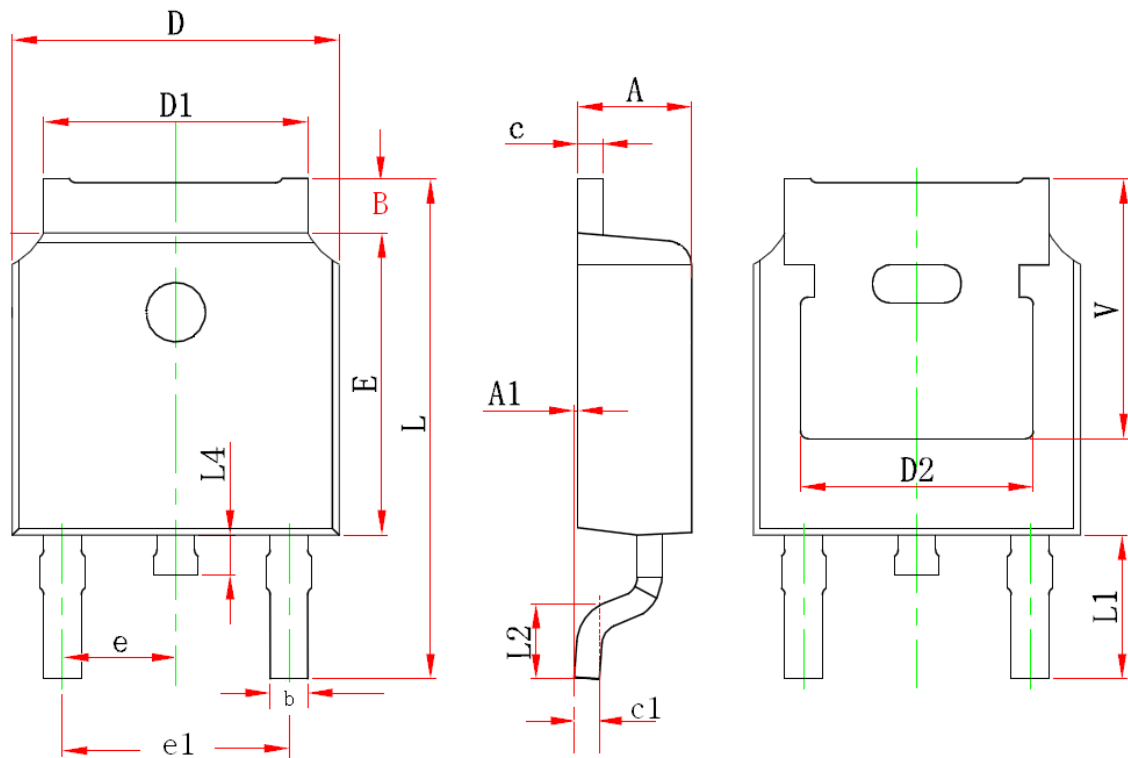
Package Dimension

TO-252-2L PLASTIC PACKAGE



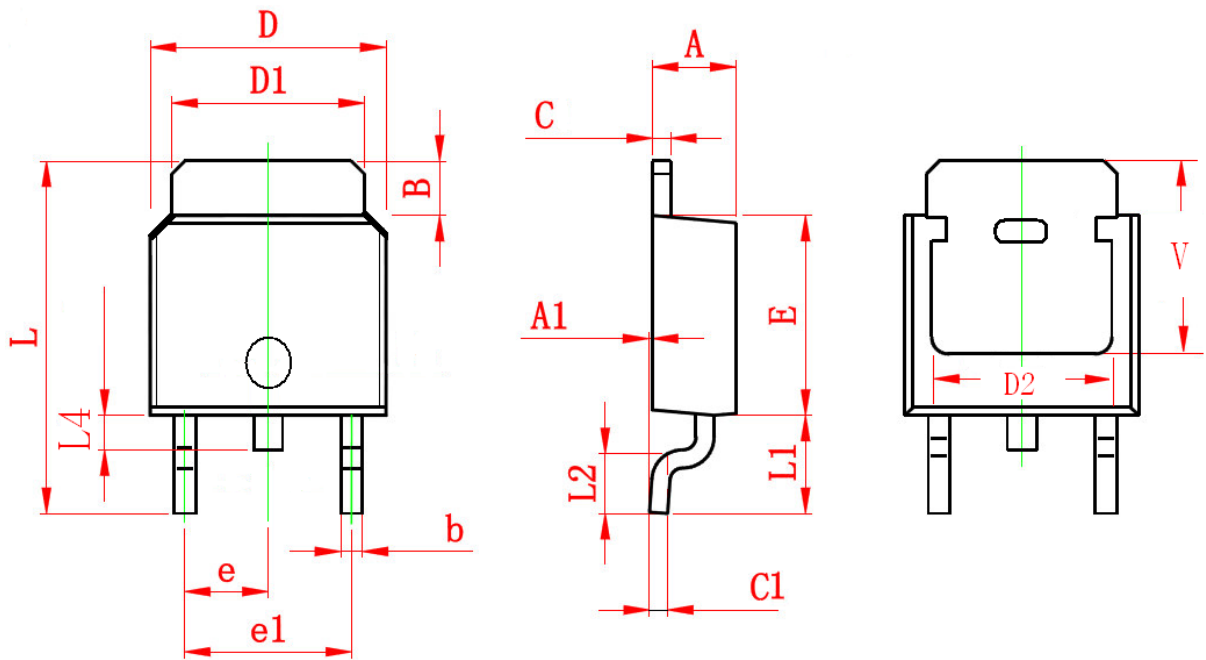
Dimensions

| SYMBOL | Millimeters | | Inches | |
|--------|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| B | 1.350 | 1.650 | 0.053 | 0.065 |
| b | 0.500 | 0.700 | 0.020 | 0.028 |
| b1 | 0.700 | 0.900 | 0.028 | 0.035 |
| c | 0.430 | 0.580 | 0.017 | 0.023 |
| c1 | 0.430 | 0.580 | 0.017 | 0.023 |
| D | 6.350 | 6.650 | 0.250 | 0.262 |
| D1 | 5.200 | 5.400 | 0.205 | 0.213 |
| E | 5.400 | 5.700 | 0.213 | 0.224 |
| e | 2.300 TYP | | 0.091 TYP | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L | 9.500 | 9.900 | 0.374 | 0.390 |
| L1 | 2.550 | 2.900 | 0.100 | 0.114 |
| L2 | 1.400 | 1.780 | 0.055 | 0.070 |
| L3 | 0.600 | 0.900 | 0.024 | 0.035 |
| V | 3.800 REF | | 0.150 REF | |



Dimensions

| SYMBOL | Millimeters | | Inches | |
|--------|-------------|--------|-----------|--------|
| | MIN | MAX | MIN | MAX |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.13 | 0.000 | 0.0051 |
| B | 0.89 | 1.30 | 0.035 | 0.0512 |
| b | 0.64 | 0.88 | 0.0252 | 0.0346 |
| C | 0.430 | 0.58 | 0.017 | 0.023 |
| C1 | 0.430 | 0.60 | 0.017 | 0.0236 |
| D | 6.350 | 6.730 | 0.250 | 0.265 |
| D1 | 5.100 | 5.460 | 0.200 | 0.215 |
| E | 6.000 | 6.220 | 0.236 | 0.244 |
| e | 2.300 TYP | | 0.091 TYP | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L | 9.400 | 10.400 | 0.37 | 0.409 |
| L1 | 2.9 REF | | 0.114 REF | |
| L2 | 1.400 | 1.780 | 0.055 | 0.070 |
| L4 | 0.600 | 1.01 | 0.024 | 0.0398 |
| V | 5.350 REF | | 0.211 REF | |
| D2 | 4.830 REF | | 0.190 REF | |







Dimensions




| SYMBOL | Millimeters | | Inches | |
|--------|-------------|--------|-----------|--------|
| | MIN | MAX | MIN | MAX |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.13 | 0.000 | 0.0051 |
| B | 0.89 | 1.27 | 0.035 | 0.05 |
| b | 0.64 | 0.88 | 0.0252 | 0.0346 |
| C | 0.430 | 0.58 | 0.017 | 0.023 |
| C1 | 0.430 | 0.60 | 0.017 | 0.0236 |
| D | 6.350 | 6.730 | 0.250 | 0.265 |
| D1 | 5.200 | 5.460 | 0.205 | 0.215 |
| E | 6.000 | 6.220 | 0.236 | 0.244 |
| e | 2.300 TYP | | 0.091 TYP | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L | 9.400 | 10.400 | 0.37 | 0.409 |
| L1 | 2.743 REF | | 0.108 REF | |
| L2 | 1.400 | 1.780 | 0.055 | 0.070 |
| L4 | 0.600 | 1.01 | 0.024 | 0.0398 |
| V | 5.350 REF | | 0.211 REF | |
| D2 | 4.830 REF | | 0.190 REF | |



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