

Features

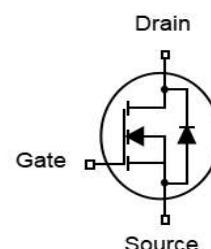
- N-Channel
- Excellent gate charge x $R_{DS(on)}$ product
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature
- Pb-free lead plating
- 100% EAS Tested

| | | |
|------------------------------|-----|------------|
| V_{DS} | 60 | V |
| $R_{DS(on),TYP}@ V_{GS}=10V$ | 2.4 | m Ω |
| I_D | 160 | A |

DFN5x6



| Part ID | Package Type | Marking | Packing |
|------------|--------------|------------|--------------|
| ZTG020N06G | DFN5x6 | ZTG020N06G | 5000pcs/Reel |



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$, unless otherwise specified

| Symbol | Parameter | Rating | Unit | |
|--|--|-------------------------------|--------------------|---|
| Common Ratings ($T_c=25^\circ\text{C}$ Unless Otherwise Noted) | | | | |
| V_{GS} | Gate-Source Voltage | ± 20 | V | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | 60 | V | |
| T_J | Maximum Junction Temperature | 150 | $^\circ\text{C}$ | |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| I_{DM} | Drain Current-Continuous@ Current-Pulsed | $T_c=25^\circ\text{C}$ 640 | A | |
| Mounted on Large Heat Sink | | | | |
| I_D | Drain Current-Continuous | $T_c=25^\circ\text{C}$ | 160 | A |
| | | $T_c=100^\circ\text{C}$ | 102 | A |
| P_D | Maximum Power Dissipation | 125 | W | |
| dv/dt | Drain Source voltage slope, $V_{DS} \leq 48V$ | 50 | V/ns | |
| dv/dt | Reverse diode dv/dt, $V_{DS} \leq 48V, I_{SD} < I_D$ | 15 | V/ns | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case (Note 2) | 1.15 | $^\circ\text{C/W}$ | |
| Drain-Source Avalanche Ratings | | | | |
| EAS | Avalanche Energy, Single Pulsed (Note 5) | 232 | mJ | |

Electrical Characteristics (T_J=25°C unless otherwise noted)

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|--|--|--|-----|------|------|------|
| Static Electrical Characteristics @ T_J=25°C (unless otherwise stated) | | | | | | |
| V(BR)DSS | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 60 | -- | -- | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =60V, V _{GS} =0V | -- | -- | 1 | μA |
| I _{GSS} | Gate-Body Leakage Current | V _{GS} =±20V, V _{DS} =0V | -- | -- | ±100 | nA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250μA | 2.3 | 3.0 | 3.7 | V |
| R _{DS(on)} | Drain-Source On-State Resistance ^(Note 3) | V _{GS} =10V, I _D =50A | -- | 2.4 | 3.0 | mΩ |
| Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) ^(Note 4) | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =30V, V _{GS} =0V, f=1MHz | -- | 4100 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 1010 | -- | pF |
| C _{rss} | Reverse Transfer Capacitance | | -- | 36 | -- | pF |
| R _g | Gate Resistance | f=1MHz | -- | 3.4 | -- | Ω |
| Q _g | Total Gate Charge | V _{DS} =30V, I _D =80A, V _{GS} =10V | -- | 62 | -- | nC |
| Q _{gs} | Gate-Source Charge | | -- | 25 | -- | nC |
| Q _{gd} | Gate-Drain Charge | | -- | 14 | -- | nC |
| Switching Characteristics ^(Note 4) | | | | | | |
| T _{d(on)} | Turn-on Delay Time | V _{DD} =30V, I _D =80A, R _G =3.0Ω, V _{GS} =10V | -- | 22 | -- | ns |
| T _r | Turn-on Rise Time | | -- | 31 | -- | ns |
| T _{d(off)} | Turn-Off Delay Time | | -- | 47 | -- | ns |
| T _f | Turn-Off Fall Time | | -- | 19 | -- | ns |
| Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| I _S | Diode Forward Current ^(Note 2) | | -- | -- | 160 | A |
| V _{SD} | Forward on voltage ^(Note 3) | I _S =80A, V _{GS} =0V | -- | -- | 1.4 | V |
| T _{rr} | Reverse Recovery Time | V _{DD} =30V, I _F =80A di/dt=100A/μs | -- | 50 | -- | ns |
| Q _{rr} | Reverse Recovery Charge | | -- | 66 | -- | nC |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_J=25°C, V_{DD}=50V, V_G=10V, L=0.1mH, R_g=25Ω

Typical Electrical and Thermal Characteristics

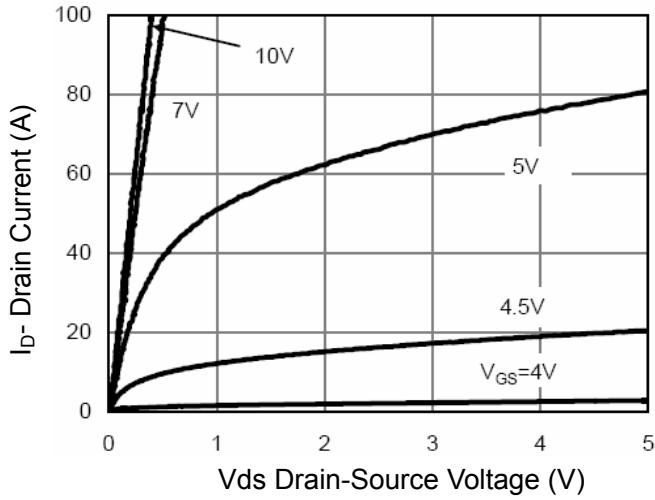


Figure 1 Output Characteristics

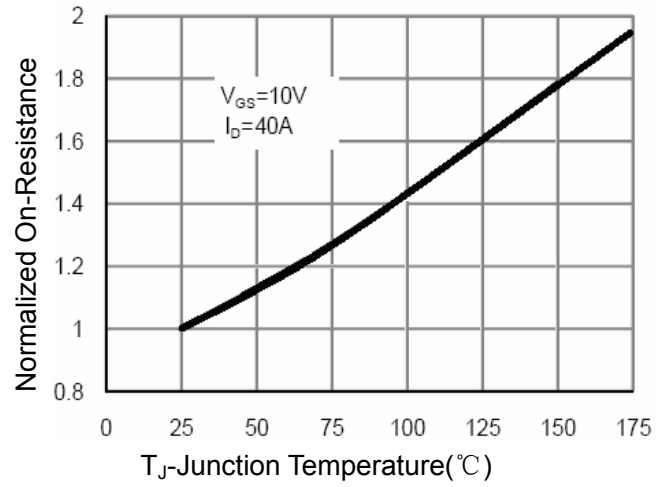


Figure 4 Rdson-Junction Temperature

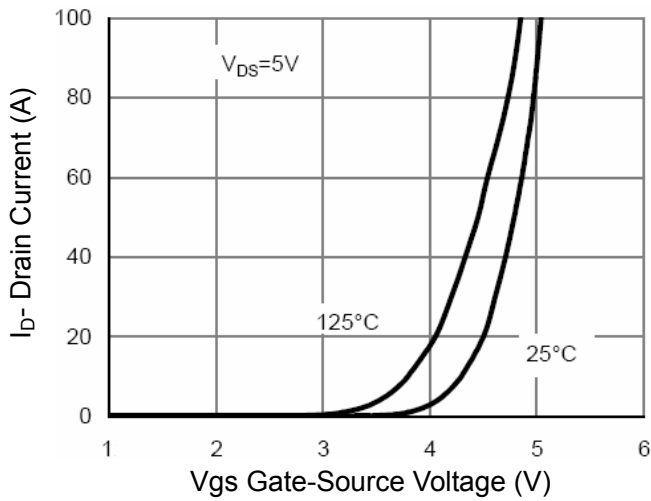


Figure 2 Transfer Characteristics

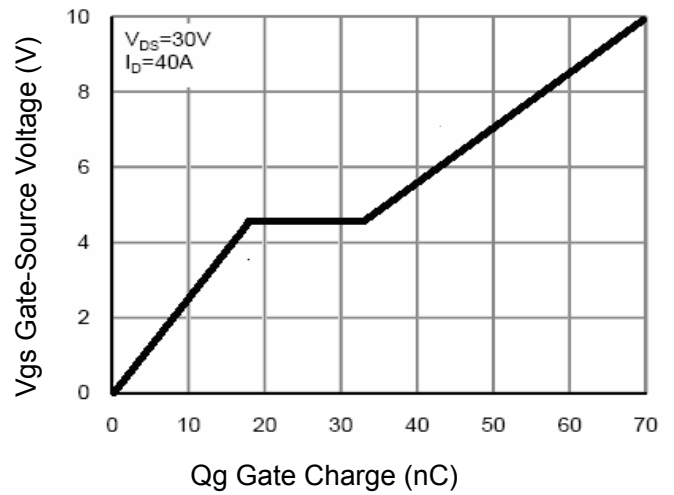


Figure 5 Gate Charge

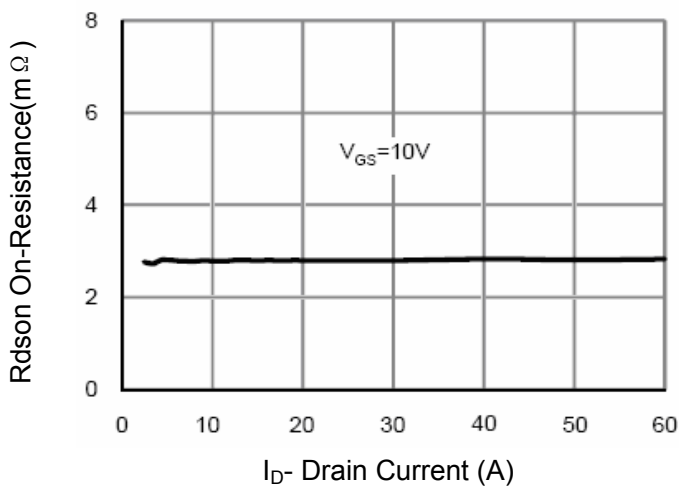


Figure 3 Rdson- Drain Current

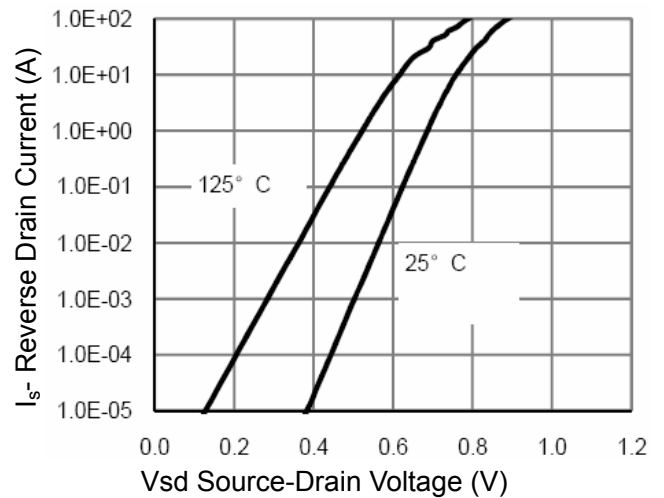


Figure 6 Source- Drain Diode Forward

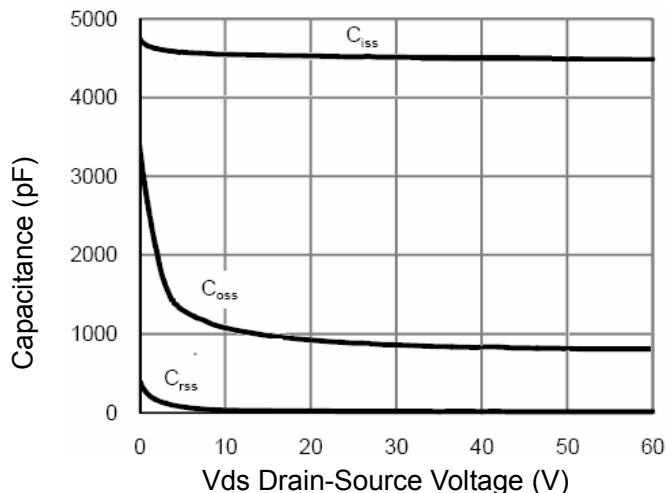


Figure 7 Capacitance vs Vds

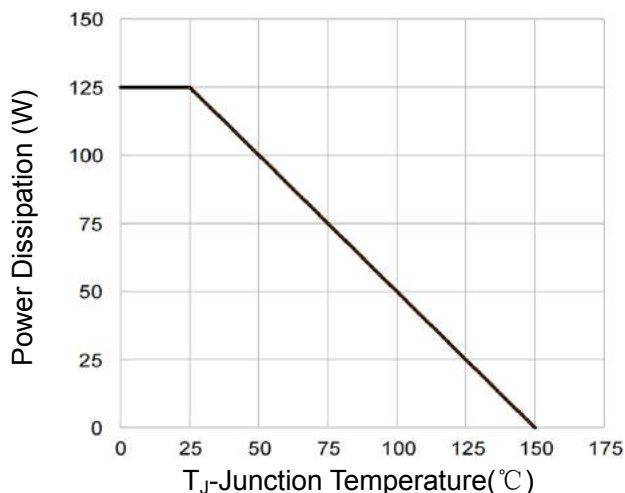


Figure 9 Power De-rating

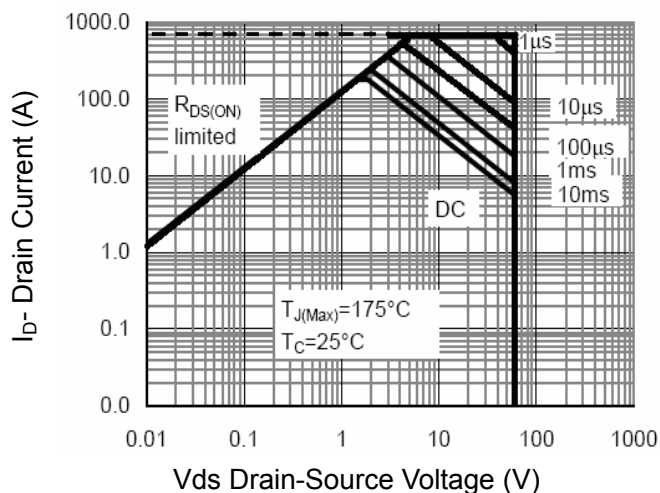


Figure 8 Safe Operation Area

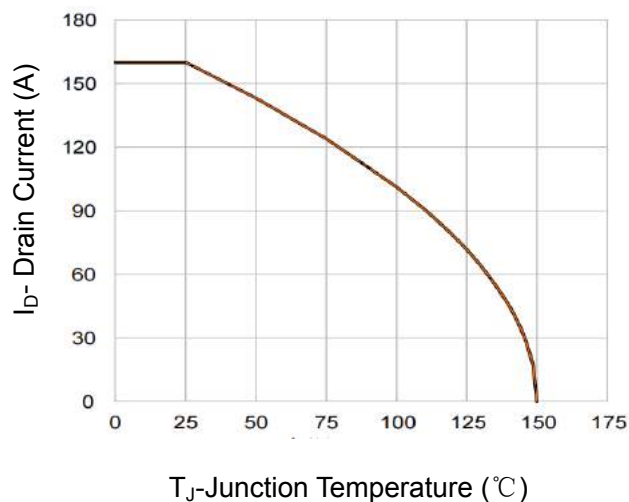


Figure 10 Current De-rating

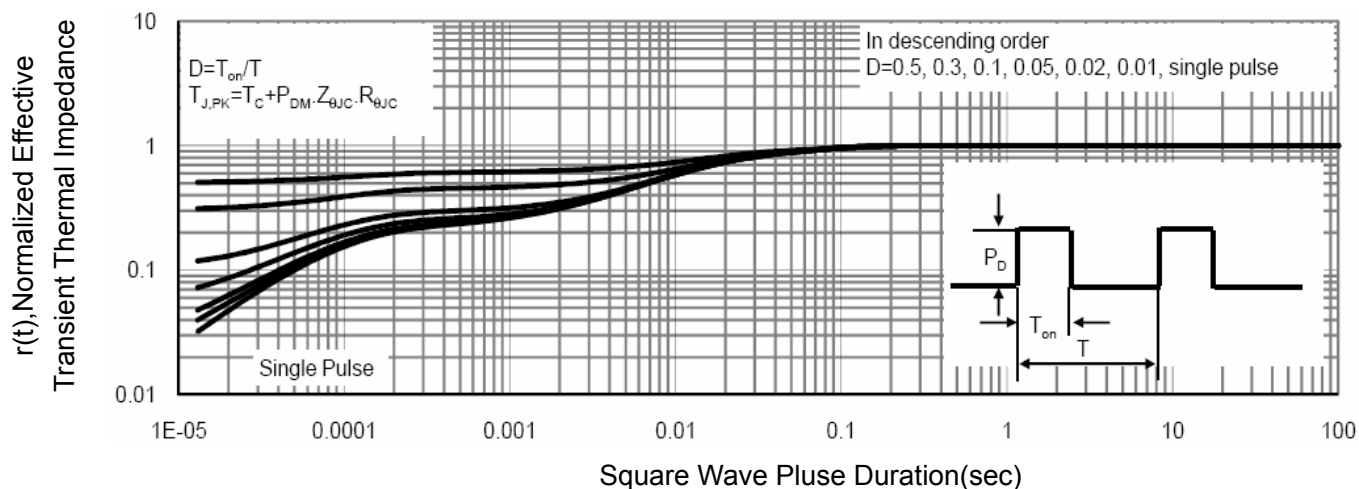
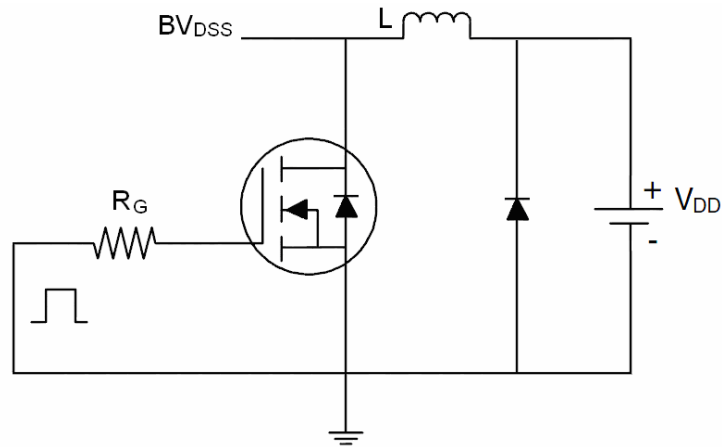


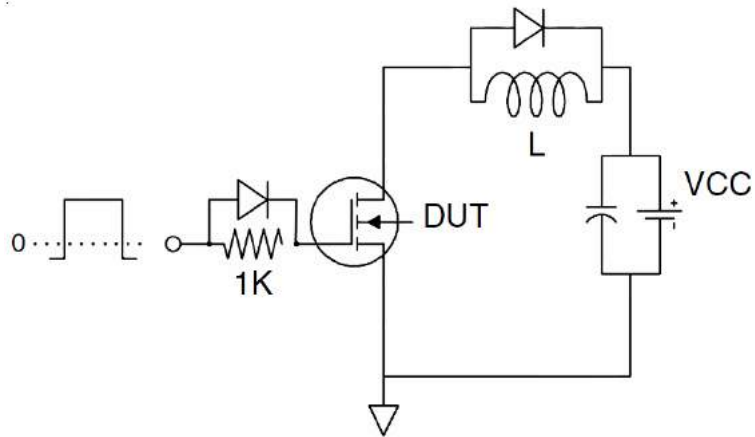
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

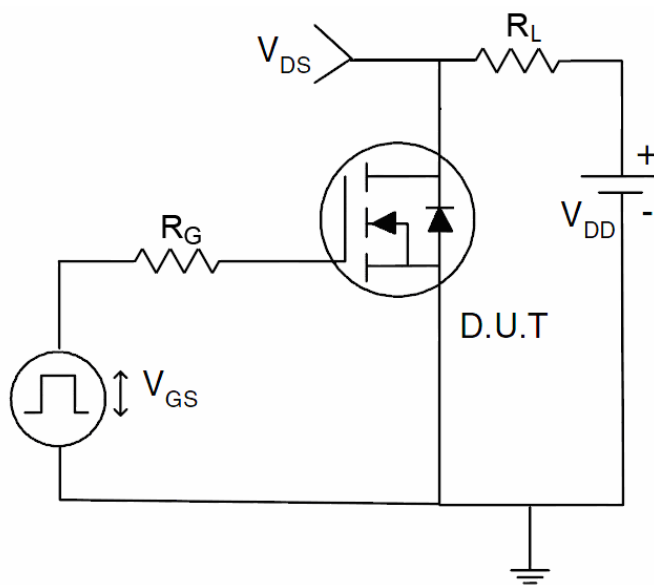
1) E_{AS} test Circuit



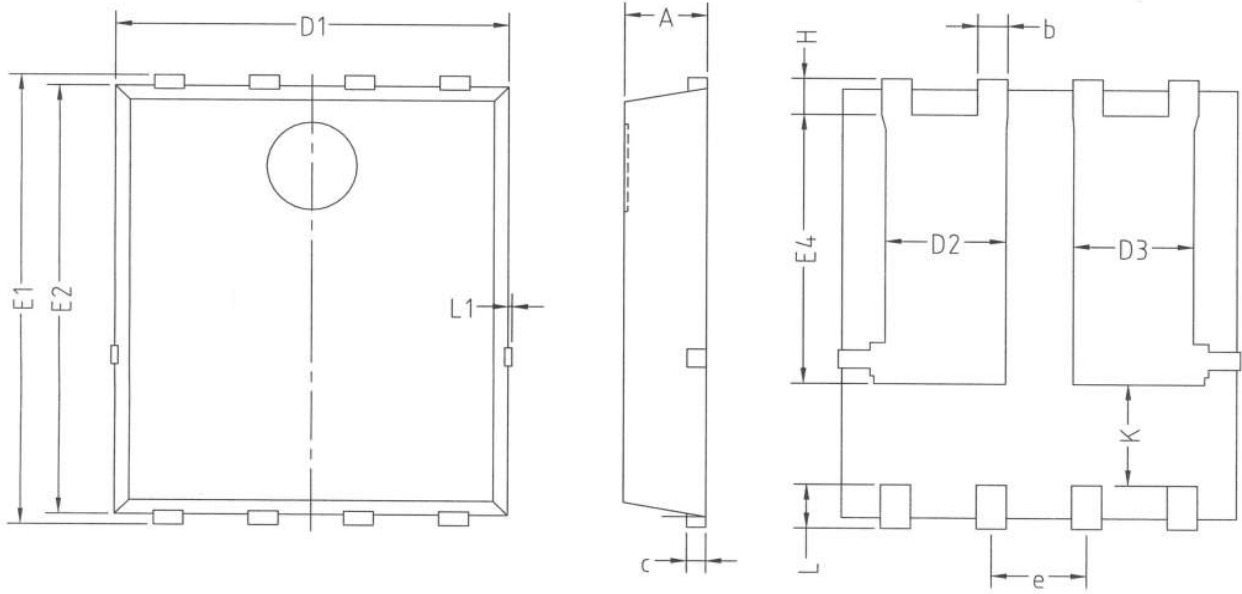
2) Gate charge test Circuit



3) Switch Time Test Circuit



DFN5x6-8L Package Information



COMMON DIMENSIONS

| SYMBOL | mm | | |
|--------|---------|-------|-------|
| | MIN | NOM | MAX |
| A | 1.00 | 1.10 | 1.20 |
| b | 0.30 | 0.40 | 0.50 |
| c | 0.154 | 0.254 | 0.354 |
| D1 | 5.00 | 5.20 | 5.40 |
| D2 | 1.40 | 1.60 | 1.80 |
| D3 | 1.40 | 1.60 | 1.80 |
| e | 1.27BSC | | |
| E1 | 5.95 | 6.15 | 6.35 |
| E2 | 5.66 | 5.86 | 6.06 |
| E4 | 3.47 | 3.67 | 3.87 |
| H | 0.40 | 0.50 | 0.60 |
| K | 1.23 | 1.38 | 1.53 |
| L | 0.30 | 0.60 | 0.70 |
| L1 | | | 0.12 |

Customer Service

Sales and Service:

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