
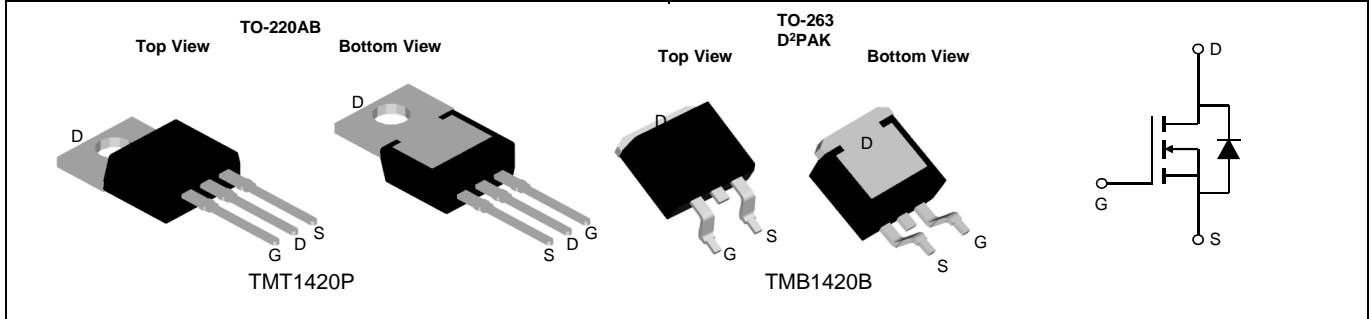


TMT1420P / TMB1420B
N-CHANNEL POWER MOSFET

| | |
|---|---|
| <p>General Description</p> <ul style="list-style-type: none"> ● Power Switching application ● Uninterruptible Power Supply | <p>Product Summary</p> <ul style="list-style-type: none"> ● 200V/36A $R_{DS(ON)}=57m\Omega(\text{typ.})@V_{GS} = 10V$ ● 100% Avalanche Tested ● Reliable and Rugged ● Lead-Free and Green Devices Available (RoHS Compliant) <p>100% UIS Tested 100% R_g Tested</p>  |
|---|---|



| Symbol | Parameter | | Rating | Unit |
|--|--|----------|------------|------|
| Common Ratings (Tc=25°C Unless Otherwise Noted) | | | | |
| V _{DSS} | Drain-Source Voltage | | 200 | V |
| V _{GSS} | Gate-Source Voltage | | ±20 | V |
| T _J | Maximum Junction Temperature | | 175 | °C |
| T _{STG} | Storage Temperature Range | | -55 to 175 | °C |
| I _S | Source Current-Continuous(Body Diode) | Tc=25°C | 36 | A |
| Mounted on Large Heat Sink | | | | |
| I _{DM} | Pulsed Drain Current * | Tc=25°C | 150 | A |
| I _D | Continuous Drain Current | Tc=25°C | 36 | A |
| | | Tc=100°C | 25 | A |
| P _D | Maximum Power Dissipation | Tc=25°C | 180 | W |
| | | Tc=100°C | 90 | W |
| R _{θJC} | Thermal Resistance, Junction-to-Case | | 0.83 | °C/W |
| R _{θJA} | Thermal Resistance, Junction-to-Ambient ** | | 62 | °C/W |
| E _{AS} | Single Pulsed-Avalanche Energy *** | L=0.3mH | 273 | mJ |

Note: * Repetitive rating; pulse width limited by max. junction temperature.
 ** Surface mounted on FR-4 board.
 *** Limited by T_{Jmax} , starting T_J=25°C, L = 0.3mH, V_{DS}=100V, V_{GS} =10V.

Electrical Characteristics (T_c =25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | 1420 | | | Unit |
|------------------------------------|----------------------------------|---|------|------|------|------|
| | | | Min | Typ. | Max | |
| Static Characteristics | | | | | | |
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _{DS} =250μA | 200 | - | - | V |
| I _{DSS} | Drain-to-Source Leakage Current | V _{DS} =200V, V _{GS} =0V | - | - | 1.0 | μA |
| | | T _J =125°C | - | - | 50 | μA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _{DS} =250μA | 3.0 | 3.8 | 5.0 | V |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| R _{DS(ON)*} | Drain-Source On-State Resistance | V _{GS} =10V, I _{DS} =30A | - | 57 | 68 | mΩ |
| Diode Characteristics | | | | | | |
| V _{SD*} | Diode Forward Voltage | I _{SD} =30A, V _{GS} =0V | - | 0.85 | 1.3 | V |
| t _{rr} | Reverse Recovery Time | I _{SD} =30A, dI _{SD} /dt=100A/μs | - | 48 | - | ns |
| Q _{rr} | Reverse Recovery Charge | | - | 78 | - | nC |
| Dynamic Characteristics | | | | | | |
| R _G | Gate Resistance | V _{GS} =0V, V _{DS} =0V, F=1 MHz | - | 2.6 | - | Ω |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz | - | 2444 | - | pF |
| C _{oss} | Output Capacitance | | | | | |
| C _{rss} | Reverse Transfer Capacitance | | | | | |
| t _{d(ON)} | Turn-on Delay Time | V _{DD} =100V, R _G =2.5Ω, I _{DS} =30A, V _{GS} =10V | - | 30 | - | ns |
| T _r | Turn-on Rise Time | | | | | |
| t _{d(OFF)} | Turn-off Delay Time | | | | | |
| T _f | Turn-off Fall Time | | | | | |
| Gate Charge Characteristics | | | | | | |
| Q _g | Total Gate Charge | V _{DS} 100V, V _{GS} =10V, I _D =20A | - | 53 | - | nC |
| Q _{gs} | Gate-Source Charge | | | | | |
| Q _{gd} | Gate-Drain Charge | | | | | |

Note: *Pulse test, pulse width ≤ 300us, duty cycle ≤ 2%

Typical Operating Characteristics

Figure 1: Power Dissipation

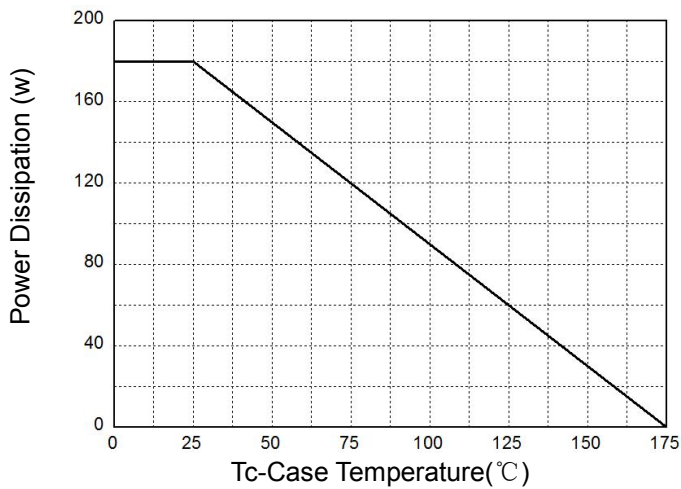


Figure 2: Drain Current

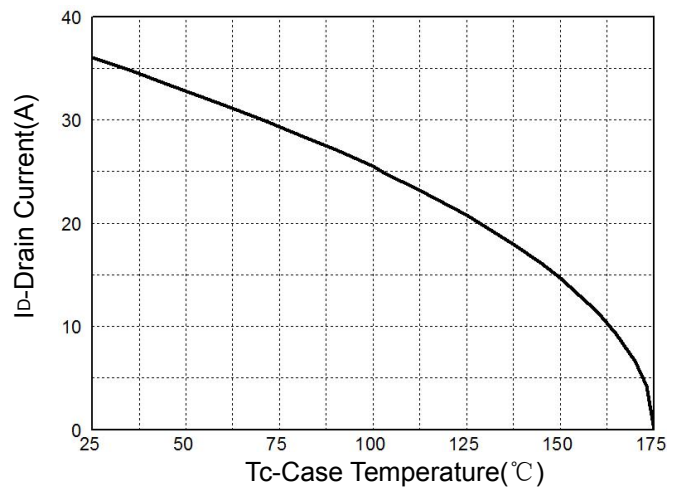


Figure 3: Safe Operation Area

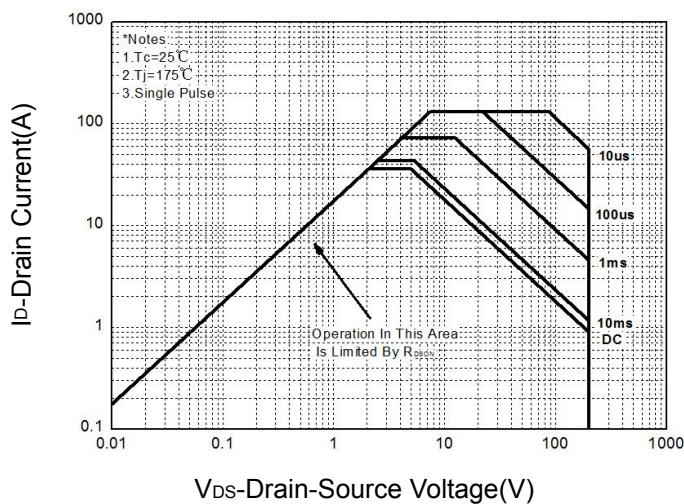


Figure 4: Thermal Transient Impedance

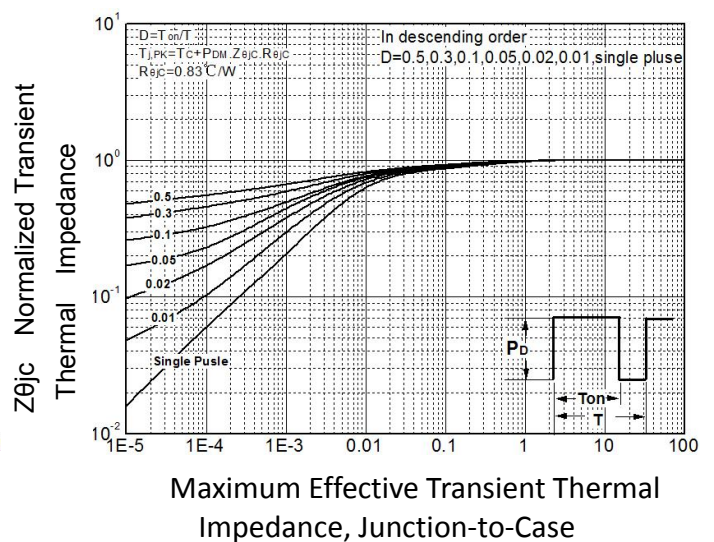


Figure 5: Output Characteristics

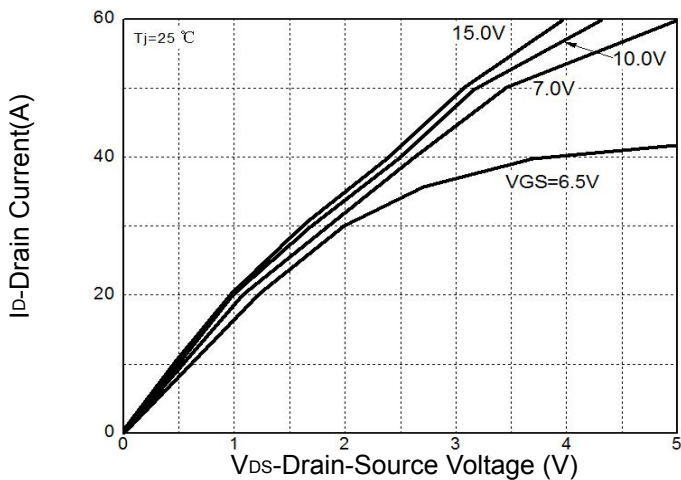
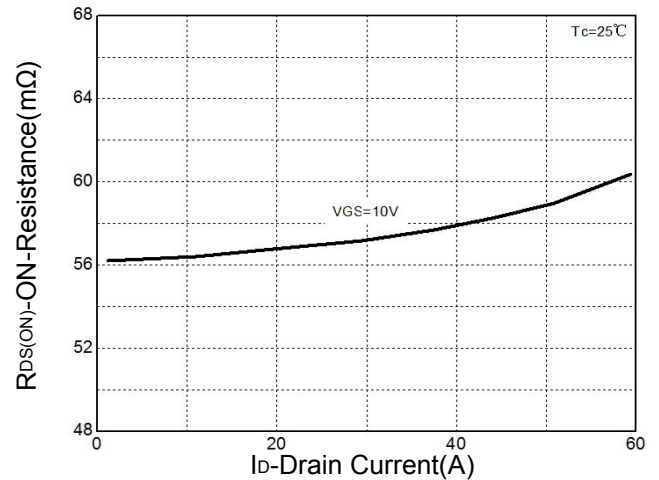


Figure 6: Drain-Source On Resistance



Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

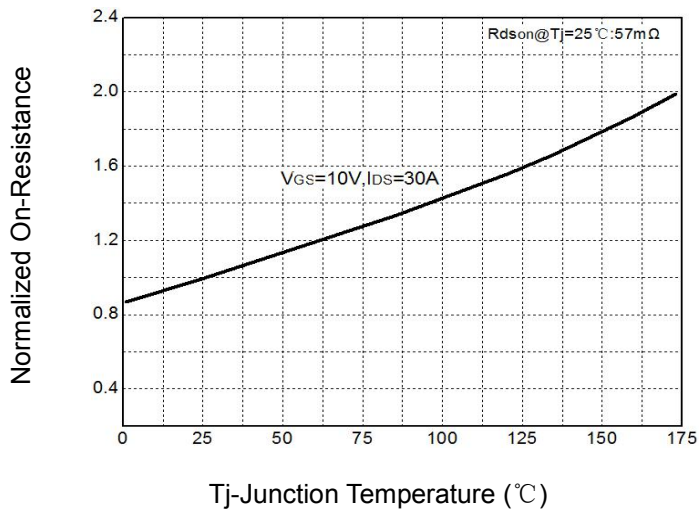


Figure 8: Source-Drain Diode Forward

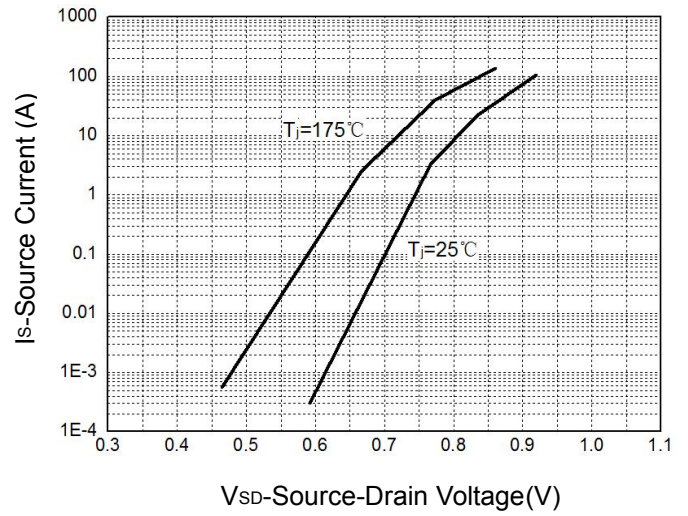


Figure 9: Capacitance Characteristics

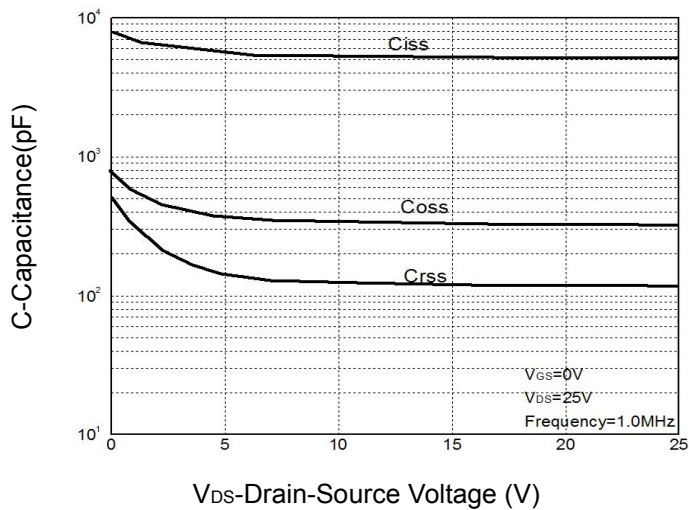
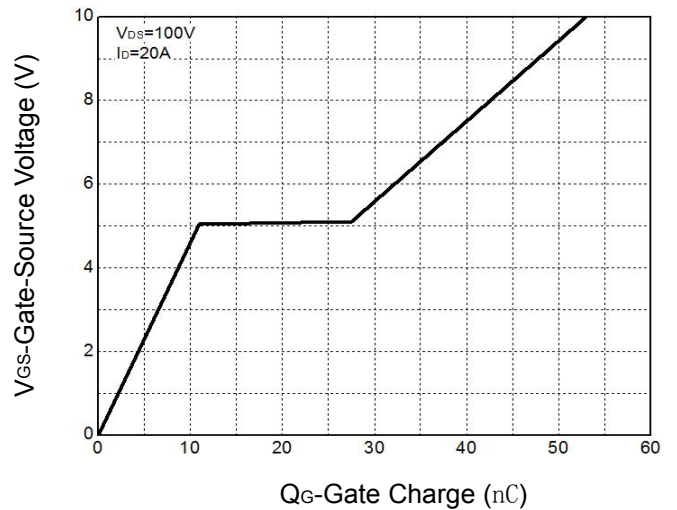
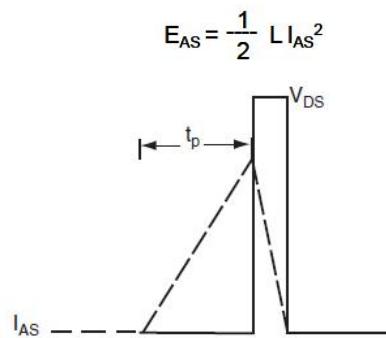
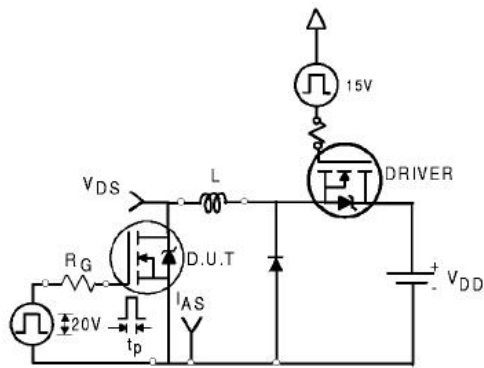


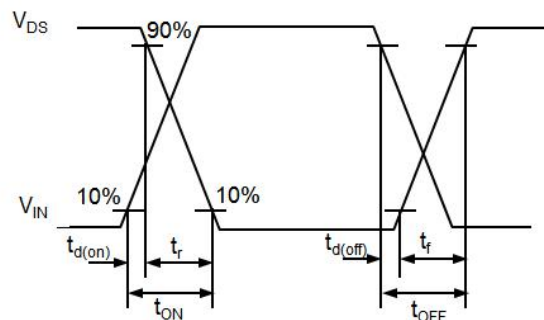
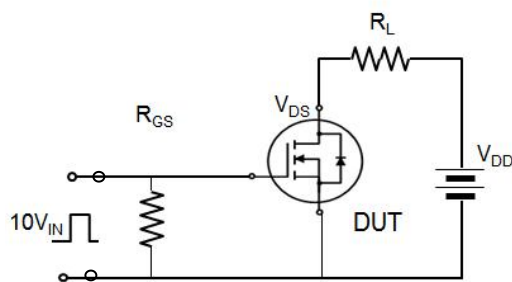
Figure 10: Gate Charge Characteristics



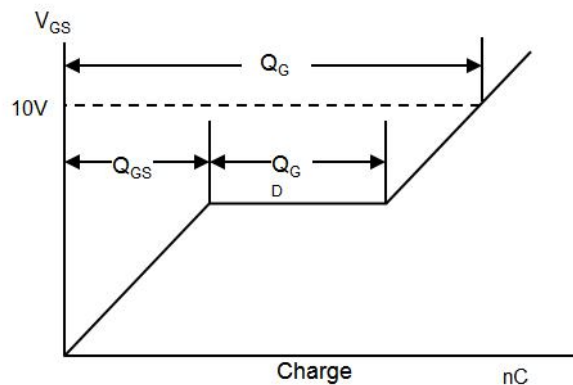
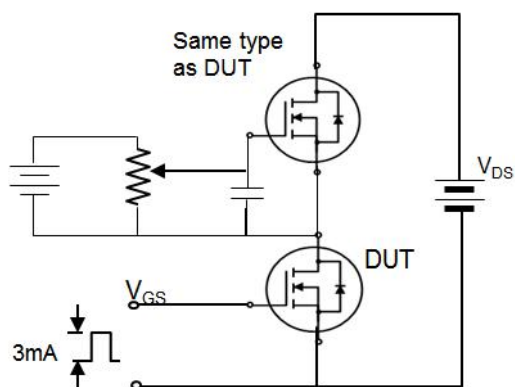
Avalanche Test Circuit



Switching Time Test Circuit

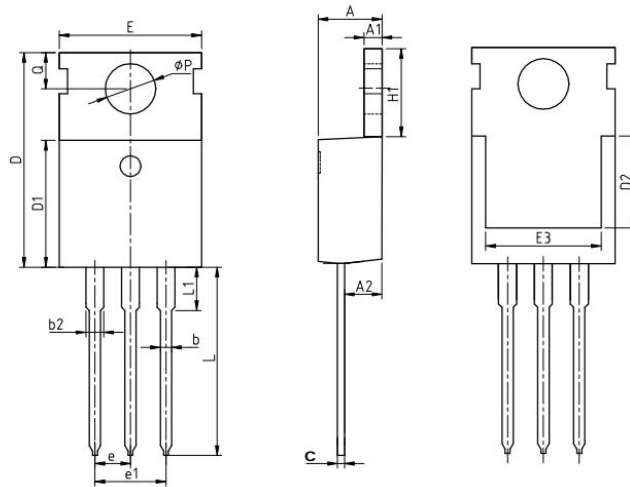


Gate Charge Test Circuit



Package Information

TO-220AB

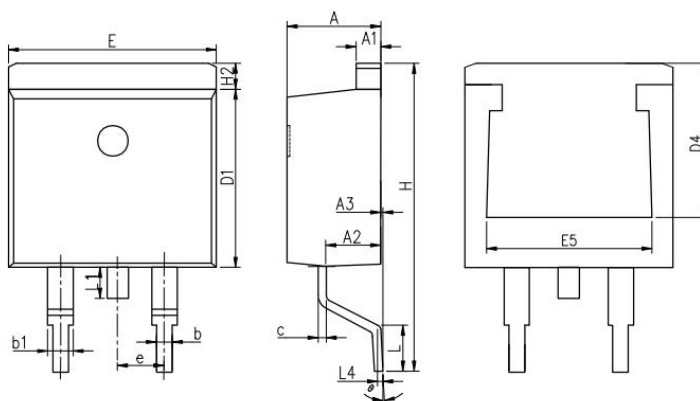


COMMON DIMENSIONS

| SYMBOL | mm | | |
|--------|----------|-------|-------|
| | MIN | NOM | MAX |
| A | 4.37 | 4.57 | 4.77 |
| A1 | 1.25 | 1.30 | 1.45 |
| A2 | 2.20 | 2.40 | 2.60 |
| b | 0.70 | 0.80 | 0.95 |
| b2 | 1.17 | 1.27 | 1.47 |
| c | 0.40 | 0.50 | 0.65 |
| D | 15.10 | 15.60 | 16.10 |
| D1 | 8.80 | 9.10 | 9.40 |
| D2 | 5.50 | - | - |
| E | 9.70 | 10.00 | 10.30 |
| E3 | 7.00 | - | - |
| e | 2.54 BSC | | |
| e1 | 5.08 BSC | | |
| H1 | 6.25 | 6.50 | 6.85 |
| L | 12.75 | 13.50 | 13.80 |
| L1 | - | 3.10 | 3.40 |
| ΦP | 3.40 | 3.60 | 3.80 |
| Q | 2.60 | 2.80 | 3.00 |

Package Information

TO-263



COMMON DIMENSIONS

| SYMBOL | mm | | |
|--------|----------|-------|-------|
| | MIN | NOM | MAX |
| A | 4.37 | 4.57 | 4.77 |
| A1 | 1.22 | 1.27 | 1.42 |
| A2 | 2.49 | 2.69 | 2.89 |
| A3 | 0 | 0.13 | 0.25 |
| b | 0.7 | 0.81 | 0.96 |
| b1 | 1.17 | 1.27 | 1.47 |
| c | 0.3 | 0.38 | 0.53 |
| D1 | 8.5 | 8.7 | 8.9 |
| D4 | 6.6 | - | - |
| E | 9.86 | 10.16 | 10.36 |
| E5 | 7.06 | - | - |
| e | 2.54 BSC | | |
| H | 14.7 | 15.1 | 15.5 |
| H2 | 1.07 | 1.27 | 1.47 |
| L | 2 | 2.3 | 2.6 |
| L1 | 1.4 | 1.55 | 1.7 |
| L4 | 0.25 BSC | | |
| θ | 0° | 5° | 9° |