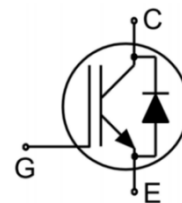


Main Product Characteristics:

| | |
|---------------|------|
| V_{CES} | 700V |
| I_C | 100A |
| $V_{CE(sat)}$ | 1.8V |


TO - 247

Schematic Diagram
Features and Benefits:

- Trench FS technology offering
- High speed switching
- Low gate charge and $V_{CE(sat)}$
- High ruggedness, temperature stable behavior
- Maximum junction temperature 175°C


Applications:

- Solar inverters
- Uninterruptible power supplies
- Motor drives
- Air condition

Absolute Max Rating:

| Symbol | Parameter | Value | Units |
|-----------------|--|-------------|------------------|
| V_{CES} | Collector-Emitter Voltage | 700 | V |
| V_{GES} | Gate- Emitter Voltage | ± 30 | V |
| I_C | Collector Current | 200 | A |
| | Collector Current @ $T_C = 100\text{ }^\circ\text{C}$ | 100 | |
| | Pulsed Collector Current, t_p limited by T_{jmax} | 400 | |
| - | Turn off safe operating area, $V_{CE}=650\text{V}$, $T_J=175^\circ\text{C}$ | 400 | |
| I_F | Diode Continuous Forward Current @ $T_C = 25\text{ }^\circ\text{C}$ | 200 | A |
| | Diode Continuous Forward Current @ $T_C = 100\text{ }^\circ\text{C}$ | 100 | |
| | Diode Maximum Forward Current | 400 | |
| P_D | Power Dissipation @ $T_C = 25^\circ\text{C}$ | 428 | W |
| T_J T_{STG} | Operating Junction and Storage Temperature Range | -55 to +175 | $^\circ\text{C}$ |

Thermal Resistance

| Symbol | Characterizes | Typ. | Max. | Units |
|------------------|--|------|------|-------|
| R _{θJC} | Thermal Resistance, Junction-to-case for IGBT | — | 0.35 | °C/W |
| | Thermal Resistance, Junction-to-case for Diode | — | 0.45 | °C/W |
| R _{θJA} | Thermal Resistance, Junction-to-ambient | — | 40 | °C/W |

Electrical Characteristics @T_A=25°C unless otherwise specified

| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------------------|---|------|------|------|-------|---|
| V _{(BR)CES} | Collector-Emitter Breakdown Voltage | 700 | 760 | — | V | V _{GE} =0V, I _{CE} =1mA |
| V _{CE(sat)} | Collector-Emitter Saturation Voltage | — | 1.8 | 2.1 | V | I _C =100A, V _{GE} =15V @ T _J =25°C |
| V _{GE(th)} | Gate Threshold Voltage | 4.5 | — | 6.5 | V | I _C =250μA, V _{CE} =V _{GE} |
| I _{CES} | Collector-Emitter Leakage Current | — | — | 1 | μA | V _{GE} =0V, V _{CE} =650V |
| I _{GES} | Gate to Emitter Reverse Leakage | — | — | 100 | nA | V _{GE} =20V, V _{CE} =0V |
| | | — | — | -100 | | V _{GE} =-20V, V _{CE} =0V |
| C _{ies} | Input capacitance | — | 7300 | — | pF | V _{GS} = 0V V _{DS} = 25V f = 1MHz |
| C _{oes} | Output capacitance | — | 245 | — | | |
| C _{res} | Reverse transfer capacitance | — | 150 | — | | |
| t _{d(on)} | Turn-on delay time | — | 57 | — | ns | V _{CC} =400V, I _C =90A, V _{GE} =0/15V, R _g =10Ω, |
| t _r | Rise time | — | 91 | — | | |
| t _{d(off)} | Turn-Off delay time | — | 315 | — | | |
| t _f | Fall time | — | 53 | — | | |
| E _{on} | Turn-On Switching Loss | — | 3.8 | — | mJ | V _{CC} =400V, I _C =90A, V _{GE} =0/15V, R _g =10Ω, |
| E _{off} | Turn-Off Switching Loss | — | 2.0 | — | | |
| E _{ts} | Total Switching Loss | — | 5.8 | — | | |
| Q _g | Total Gate Charge | — | 225 | — | nC | V _{CC} =480V, I _C =100A, V _{GE} =15V |
| Q _{ge} | Gate to Emitter Charge | — | 52 | — | | |
| Q _{gc} | Gate to Collector Charge | — | 93 | — | | |
| I _{C(SC)} | Short circuit collector current Max. 1000 short circuits Time between short circuits: ≥1.0s | — | 660 | — | A | V _{GE} =15V, V _{CC} ≤400V, t _{sc} ≤7μs |

Electrical Characteristics of the Diode @T_A=25°C unless otherwise specified

| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|------------------|-------------------------------------|------|------|------|-------|--|
| V _{FM} | Diode Forward Voltage | — | 1.80 | 3.2 | V | I _F =100A |
| t _{rr} | Reverse Recovery Time | — | 169 | — | ns | T _J = 25°C, I _F =90A, V _R =400V V _{GE} =0/15V |
| Q _{rr} | Reverse Recovery Charge | — | 1.69 | — | μC | |
| I _{RRM} | Diode Peak Reverse Recovery Current | — | 17 | — | A | |

Typical Electrical and Thermal Characteristics

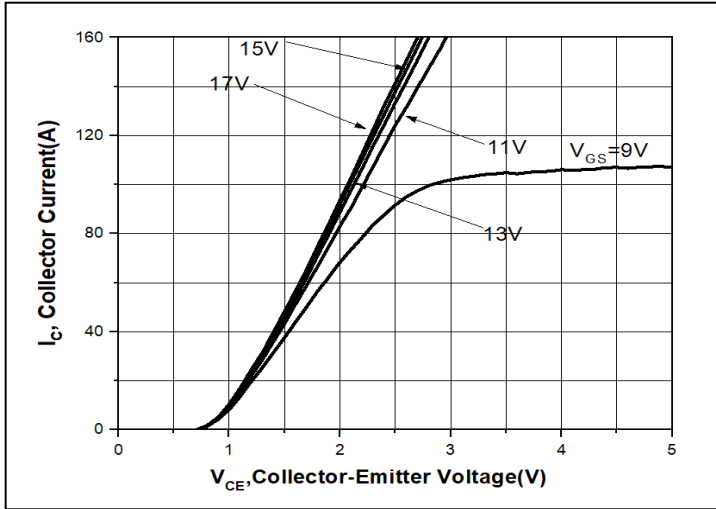


Figure1. Typical Output Characteristics

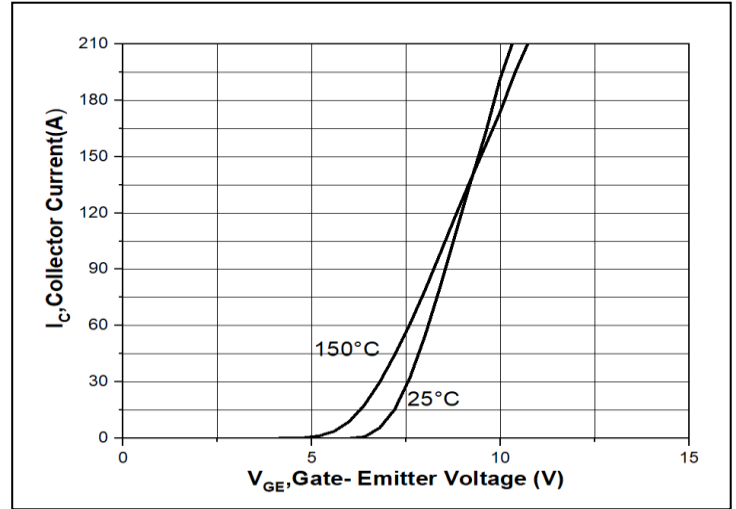


Figure2. Typical Transfer Characteristics

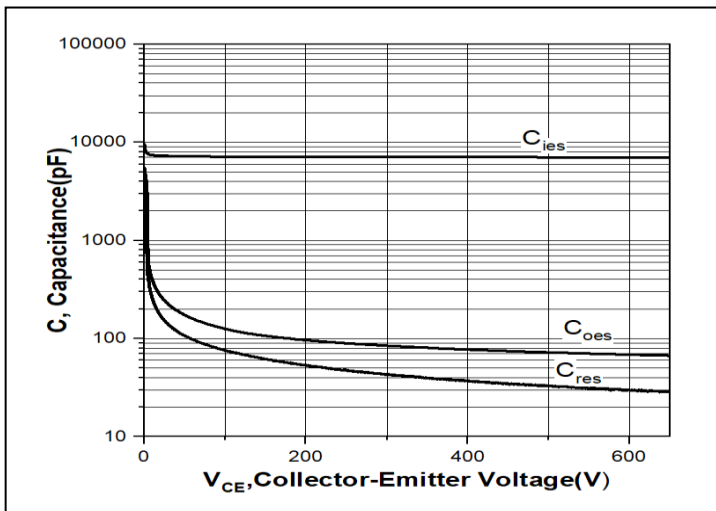


Figure3. Typical Capacitance

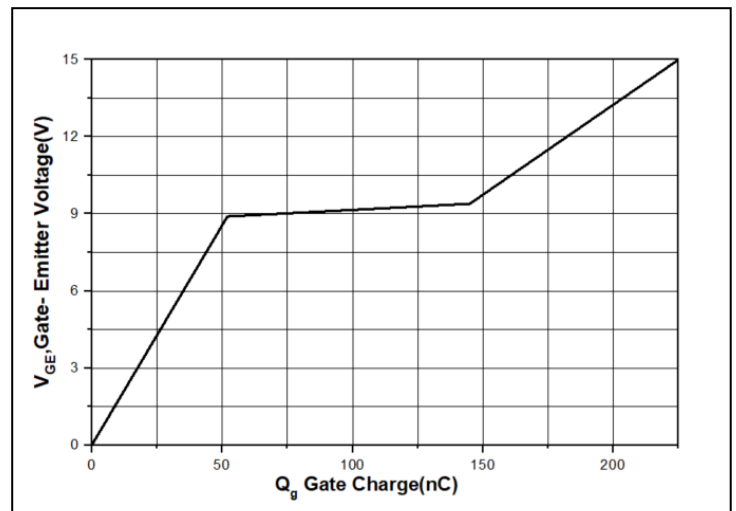


Figure4. Typical Gate Charge

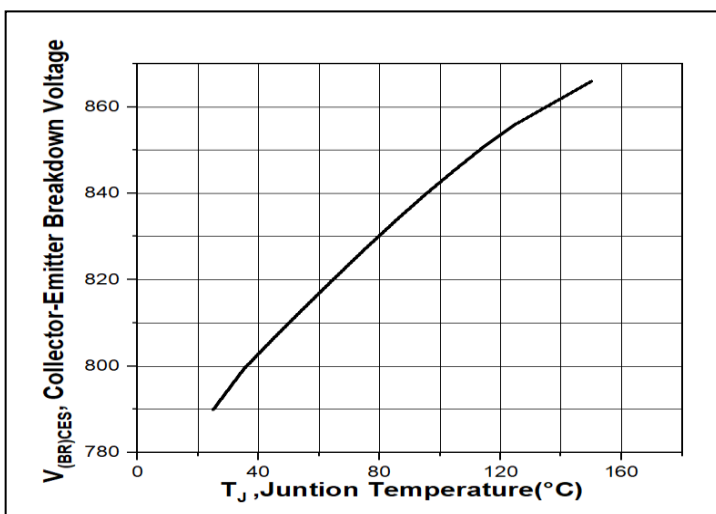


Figure5. Collector-Emmitter Breakdown Voltage vs. Temperature

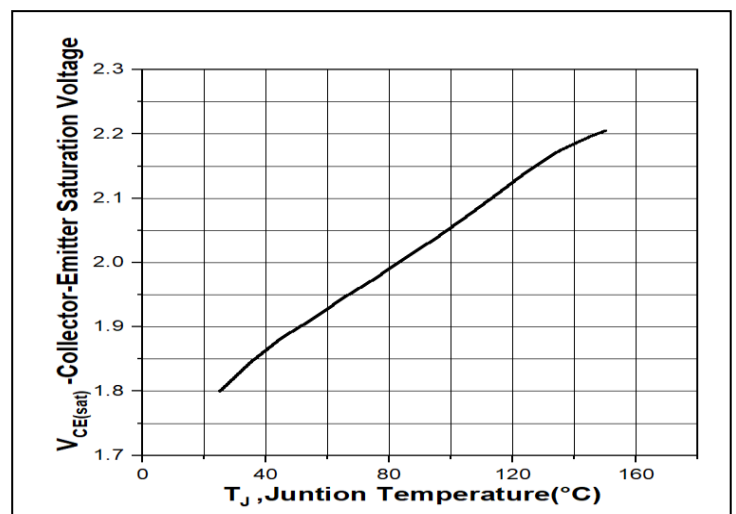


Figure6. Collector-Emmitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

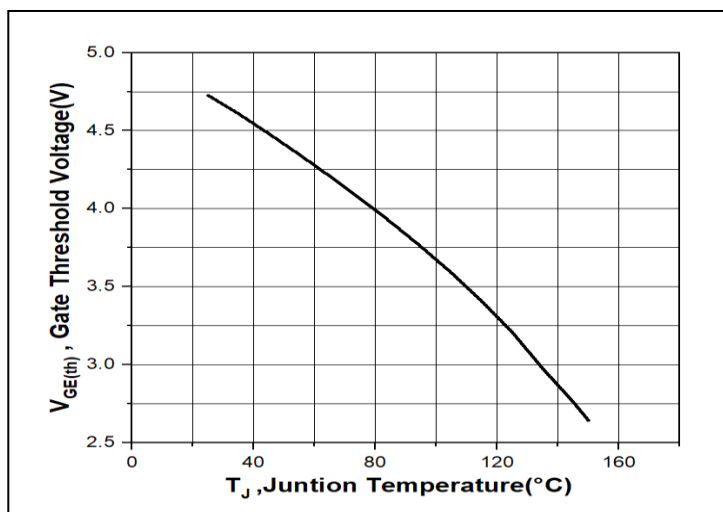


Figure7. Gate Threshold Voltage vs. Temperature

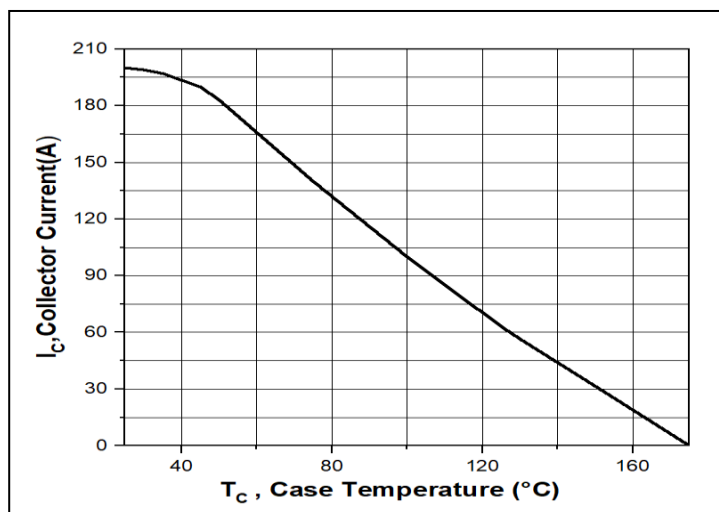


Figure8. Collector Current vs. Temperature

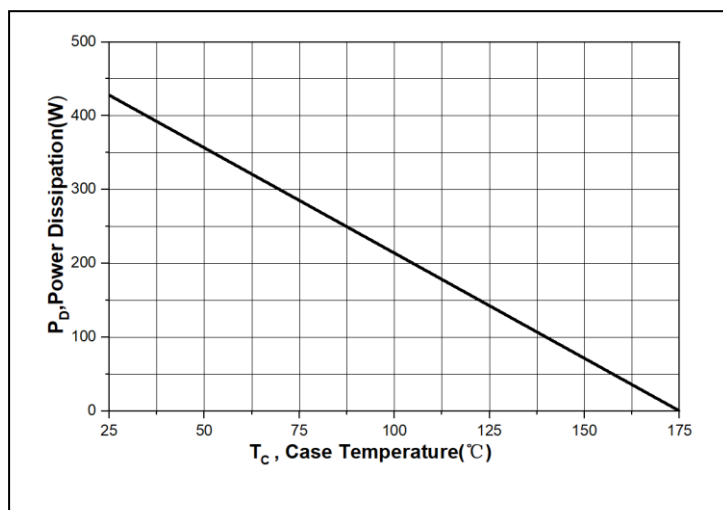
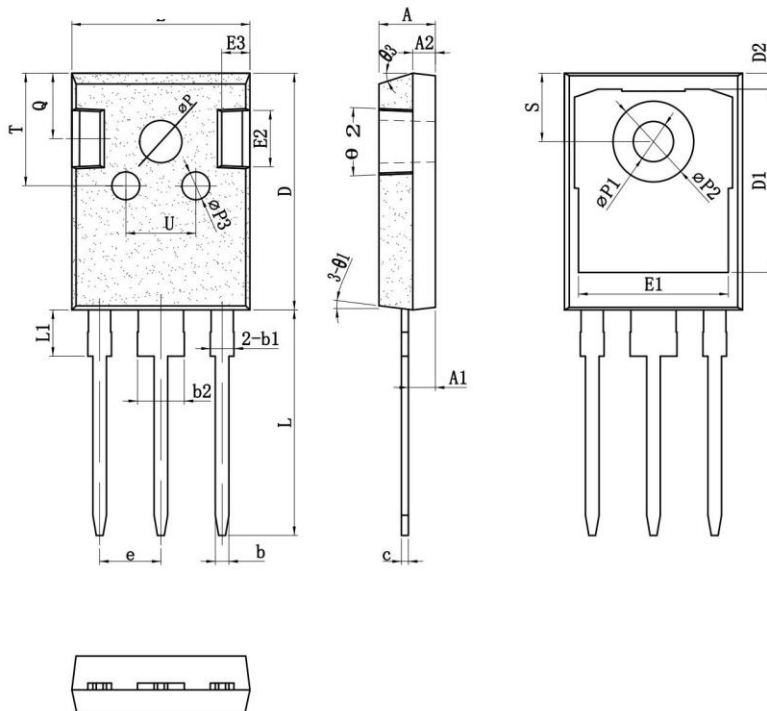
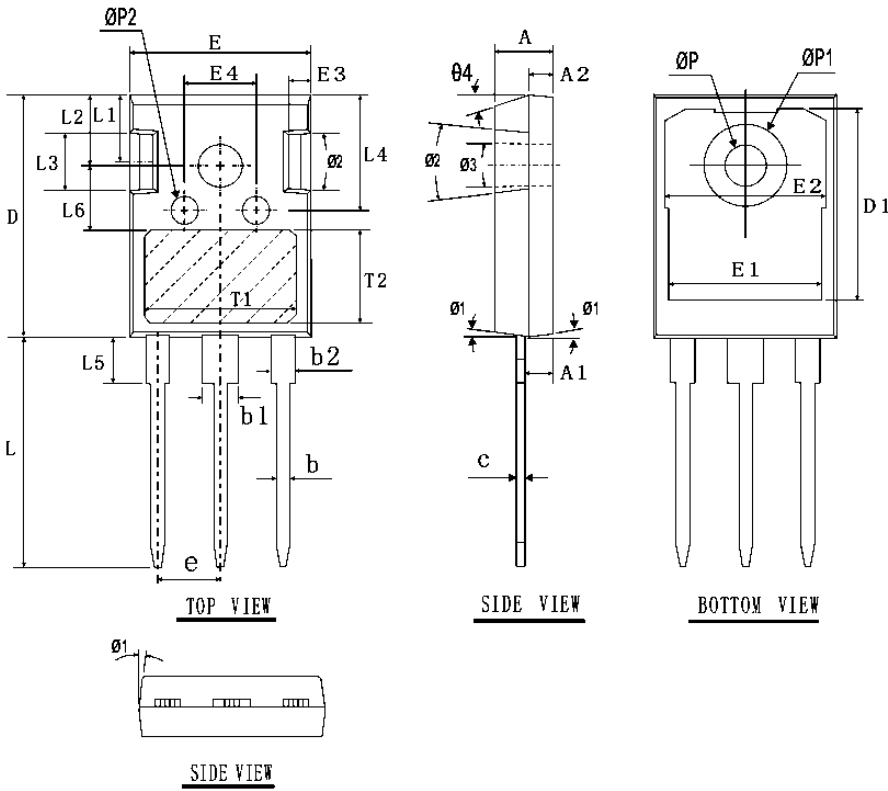


Figure9. Power Dissipation vs. Case Temperature

Mechanical Data:
Option1:
Unit:mm


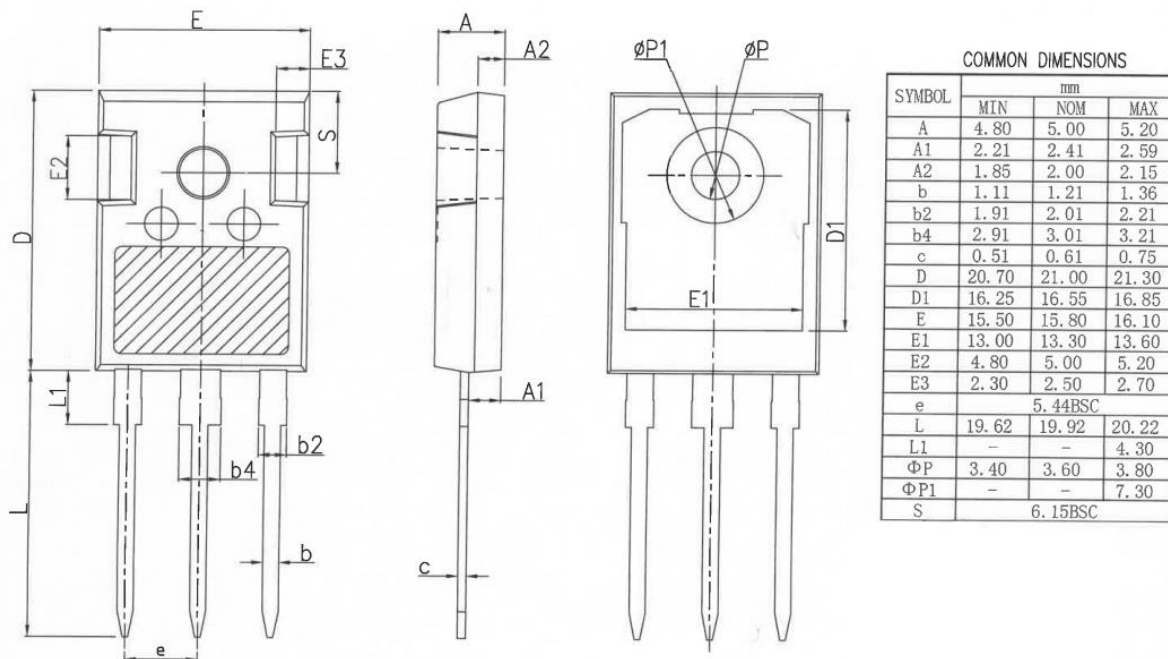
| SYMBOL | mm | | |
|--------|-------|-------|-------|
| | MIN | NOM | MAX |
| *A | 4.90 | 5.00 | 5.10 |
| *A1 | 2.31 | 2.41 | 2.51 |
| A2 | 1.90 | 2.00 | 2.10 |
| *b | 1.15 | 1.20 | 1.25 |
| *b1 | 1.95 | 2.10 | 2.25 |
| *b2 | 2.95 | 3.10 | 3.25 |
| *c | 0.55 | 0.60 | 0.65 |
| *D | 20.90 | 21.00 | 21.10 |
| D1 | 16.35 | 16.55 | 16.75 |
| D2 | 1.05 | 1.20 | 1.35 |
| *E | 15.70 | 15.80 | 15.90 |
| E1 | 13.10 | 13.25 | 13.40 |
| E2 | 4.90 | 5.00 | 5.10 |
| E3 | 2.40 | 2.50 | 2.60 |
| *e | 5.40 | 5.44 | 5.48 |
| *L | 19.80 | 19.98 | 20.15 |
| *L1 | - | - | 4.30 |
| *ΦP | 3.60 | 3.70 | 3.80 |
| *ΦP1 | 3.45 | 3.55 | 3.65 |
| ΦP2 | 7.03 | 7.18 | 7.33 |
| ΦP3 | 2.40 | 2.50 | 2.60 |
| Q | 5.60 | 5.80 | 6.00 |
| *S | 6.05 | 6.15 | 6.25 |
| T | 9.80 | 10.00 | 10.20 |
| U | 6.00 | 6.20 | 6.40 |
| θ1 | 5° | 7° | 9° |
| θ2 | 1° | 3° | 5° |
| θ3 | 13° | 15° | 17° |

Option2:



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

| SYMBOL | MIN | NOM | MAX |
|--------|----------|-------|-------|
| A | 4.80 | 5.00 | 5.20 |
| A1 | 2.20 | 2.40 | 2.60 |
| A2 | 1.85 | 2.00 | 2.15 |
| b | 1.10 | 1.20 | 1.30 |
| b1 | 2.80 | 3.00 | 3.20 |
| b2 | 1.80 | 2.00 | 2.20 |
| C | 0.52 | 0.62 | 0.72 |
| D | 20.35 | 20.65 | 20.95 |
| D1 | 16.35 | 16.55 | 16.75 |
| E | 15.50 | 15.80 | 16.10 |
| E1 | 13.10 | 13.30 | 13.50 |
| E2 | 13.80 | 14.00 | 14.20 |
| E3 | 1.45 | 1.60 | 1.75 |
| E4 | 6.00 | 6.20 | 6.40 |
| L | 19.80 | 20.00 | 20.20 |
| L1 | 5.88 | 5.98 | 6.08 |
| L2 | 5.88 | 5.98 | 6.08 |
| L3 | 4.90 | 5.00 | 5.10 |
| L4 | 9.70 | 9.80 | 9.90 |
| L5 | 4.10 | 4.30 | 4.50 |
| Ø1 | 4° | 7° | 10° |
| Ø2 | 11° | 14° | 17° |
| Ø3 | 1° | --- | 2° |
| Ø4 | 10° | 15° | 20° |
| ØP | 3.35 | 3.60 | 3.85 |
| ØP1 | --- | --- | 7.30 |
| ØP2 | 2.25 | 2.50 | 2.75 |
| e | 5.44BSC | | |
| T1 | 12.80REF | | |
| T2 | 7.80REF | | |
| L6 | 5.50REF | | |

Option3:


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