



Main Product Characteristics:

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Features and Benefits:

- Trench FS technology offering
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- High ruggedness, temperature stable behavior
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Applications:

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 | 160 | A |
| | Collector Current @ $T_C = 100\text{ }^\circ\text{C}$ | 80 | |
| I_{Cpuls} | Pulsed Collector Current t_p limited by T_{jmax} | 320 | |
| - | Turn off safe operating area $V_{CE}=650V$ $T_J=175^\circ\text{C}$ | 320 | |
| I_F | Diode Continuous Forward Current @ $T_C = 25\text{ }^\circ\text{C}$ | 160 | A |
| | Diode Continuous Forward Current @ $T_C = 100\text{ }^\circ\text{C}$ | 80 | |
| I_{FM} | Diode Maximum Forward Current | 320 | |
| P_D | Power Dissipation @ $T_C = 25^\circ\text{C}$ | 469 | W |
| | Power Dissipation @ $T_C = 100^\circ\text{C}$ | 234 | W |
| T_J T_{STG} | Operating Junction and Storage Temperature Range | -55 to +175 | $^\circ\text{C}$ |
| T_L | Maximum Temperature for Soldering | 260 | $^\circ\text{C}$ |



Thermal Resistance

| Symbol | Characterizes | Typ. | Max. | Units |
|--------|--|------|------|-------|
| | Thermal Resistance, Junction-to-case for IGBT | | | °C |
| | Thermal Resistance, Junction-to-case for Diode | | | °C |
| | Thermal Resistance, Junction-to-ambient | | | °C |

Electrical Characteristics °C

| 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 | | 1.6 | 1.85 | V | I _C =80A, V _{GE} =15V @T _J 25°C |
| V _{GE(th)} | Gate Threshold Voltage | 4.5 | | 6.5 | V | I _C =250 C _E =V _{GE} |
| I _{CES} | Collector-Emitter Leakage Current | | | 1 | A | V _{GE} =0V, V _{CE} =650V |
| I _{GES} | Gate to Emitter Reverse Leakage | | | 100 -100 | nA | V _{GE} =20V, V _{CE} =0V V _{GE} =-20V, V _{CE} =0V |
| C _{ies} | Input capacitance | | 7278 | | pF | V _{GS} = 0V V _{DS} = 25V 1MHz |
| C _{oes} | Output capacitance | | 248 | | | |
| C _{res} | Reverse transfer capacitance | | 151 | | | |
| t _{d(on)} | Turn-on delay time | | | | ns | V _{CC} =400V, I _C =80A, V _{GE} =0/15V, R _g =10 |
| t _r | Rise time | | | | | |
| t _{d(off)} | Turn-Off delay time | | | | | |
| t _f | Fall time | | | | | |
| E _{on} | Turn-On Switching Loss | | | | mJ | V _{CC} =400V, I _C =80A, V _{GE} =0/15V, R _g =10 |
| E _{off} | Turn-Off Switching Loss | | | | | |
| E _{ts} | Total Switching Loss | | | | | |
| Q _g | Total Gate Charge | | | | nC | V _{CC} =480V, I _C =80A, V _{GE} =15V |
| Q _{ge} | Gate to Emitter Charge | | | | | |
| Q _{gc} | Gate to Collector Charge | | | | | |
| I _{C(SC)} | Short circuit collector current Max.1000 short circuits Time between short circuits: 1.0s | | | | A | V _{GE} =15V, V _{CC} 400V, t _{sc} 7 s |

Electrical Characteristics of the Diode °C

| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|------------------|-------------------------------------|------|------|------|-------|--|
| V _{FM} | Diode Forward Voltage | | 1.72 | 3 | V | I _F =80A |
| t _{rr} | Reverse Recovery Time | | 162 | | ns | T _J = 25°C, I _F =80A, V _R =400V V _{GE} =0/15V |
| Q _{rr} | Reverse Recovery Charge | | 1.53 | | | |
| I _{RRM} | Diode Peak Reverse Recovery Current | | 16.3 | | A | |



Typical Electrical and Thermal Characteristics

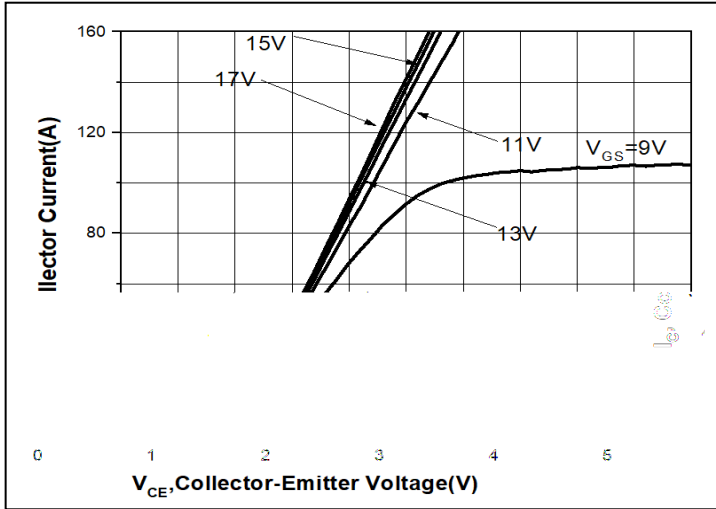


Figure1. Typical Output Characteristics

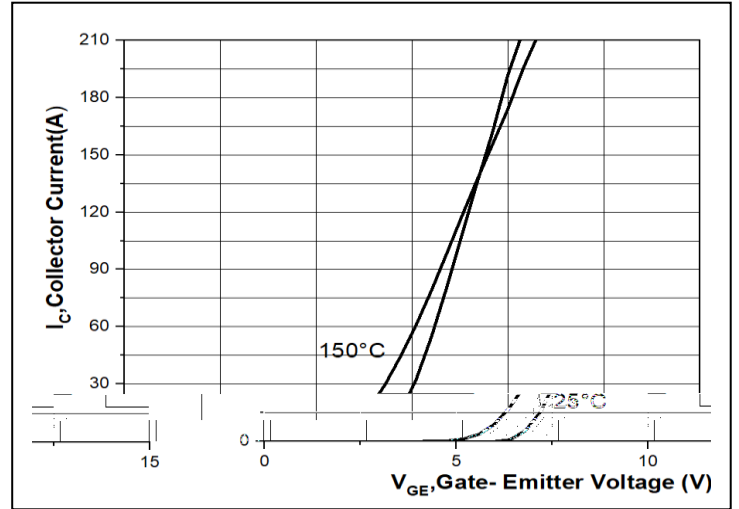


Figure2. Typical Transfer Characteristics

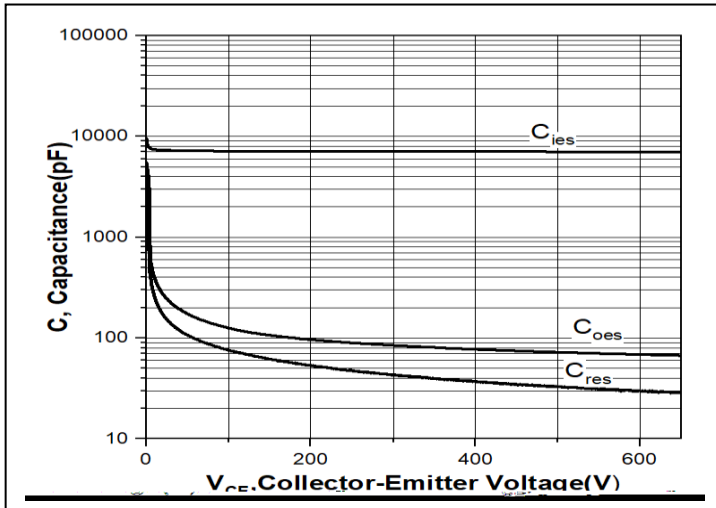


Figure3. Typical Capacitance

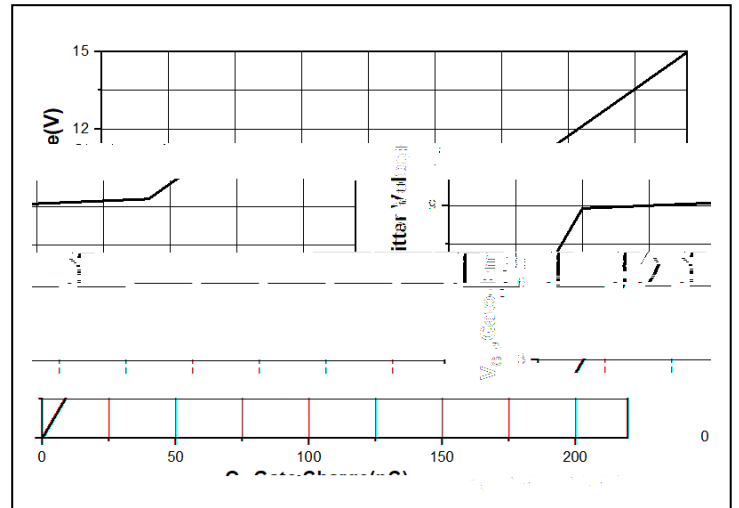


Figure4. Typical Gate Charge

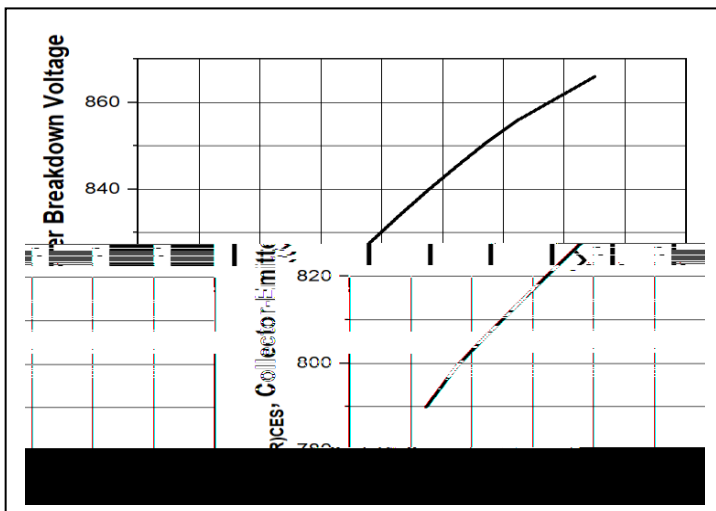


Figure5. Collector-Emitter Breakdown Voltage vs. Temperature

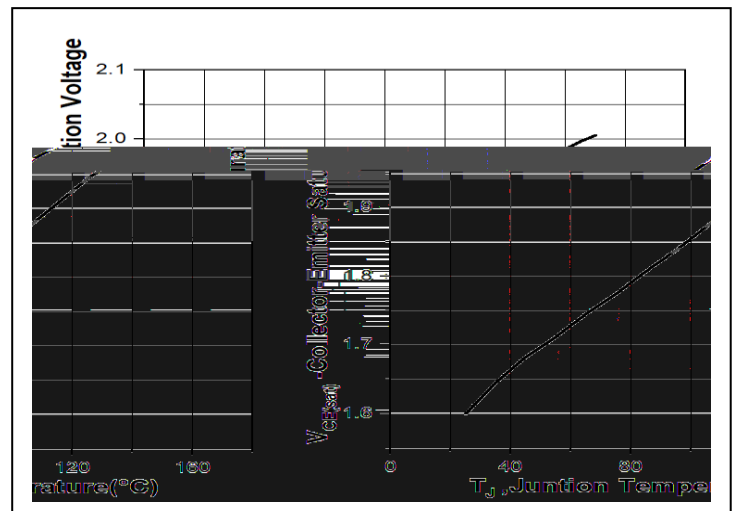


Figure6. Collector-Emitter Saturation Voltage vs. Temperature



Typical Electrical and Thermal Characteristics

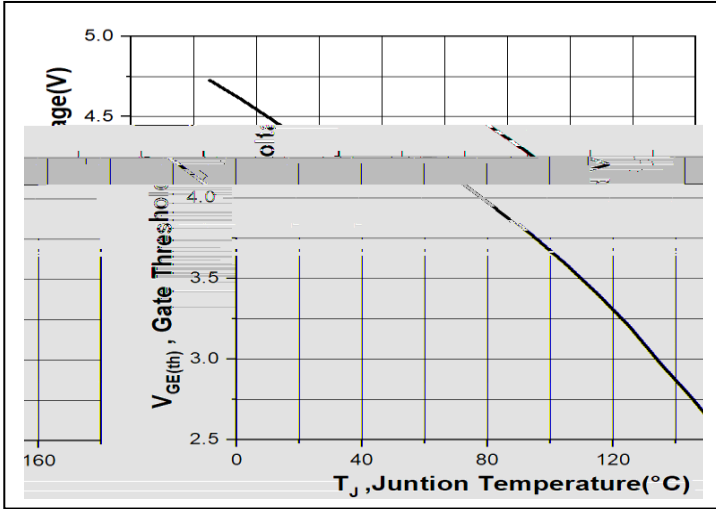


Figure 7. Gate Threshold Voltage vs. Temperature

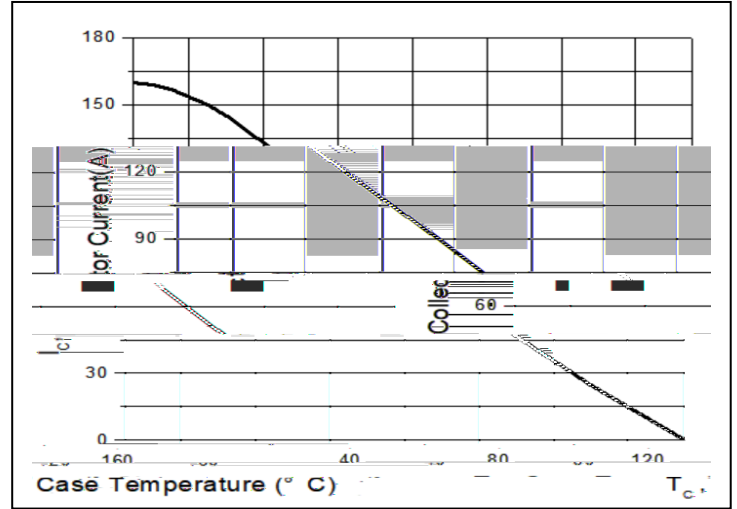


Figure 8. Collector Current vs. Temperature

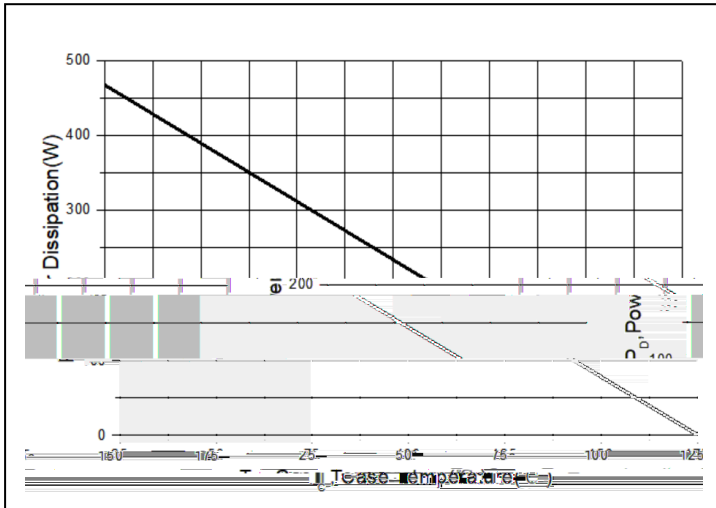


Figure 9. Power Dissipation vs. Case Temperature

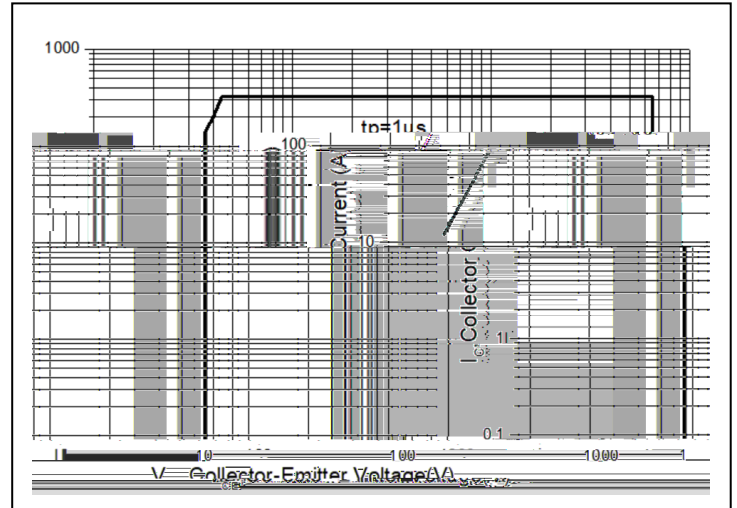


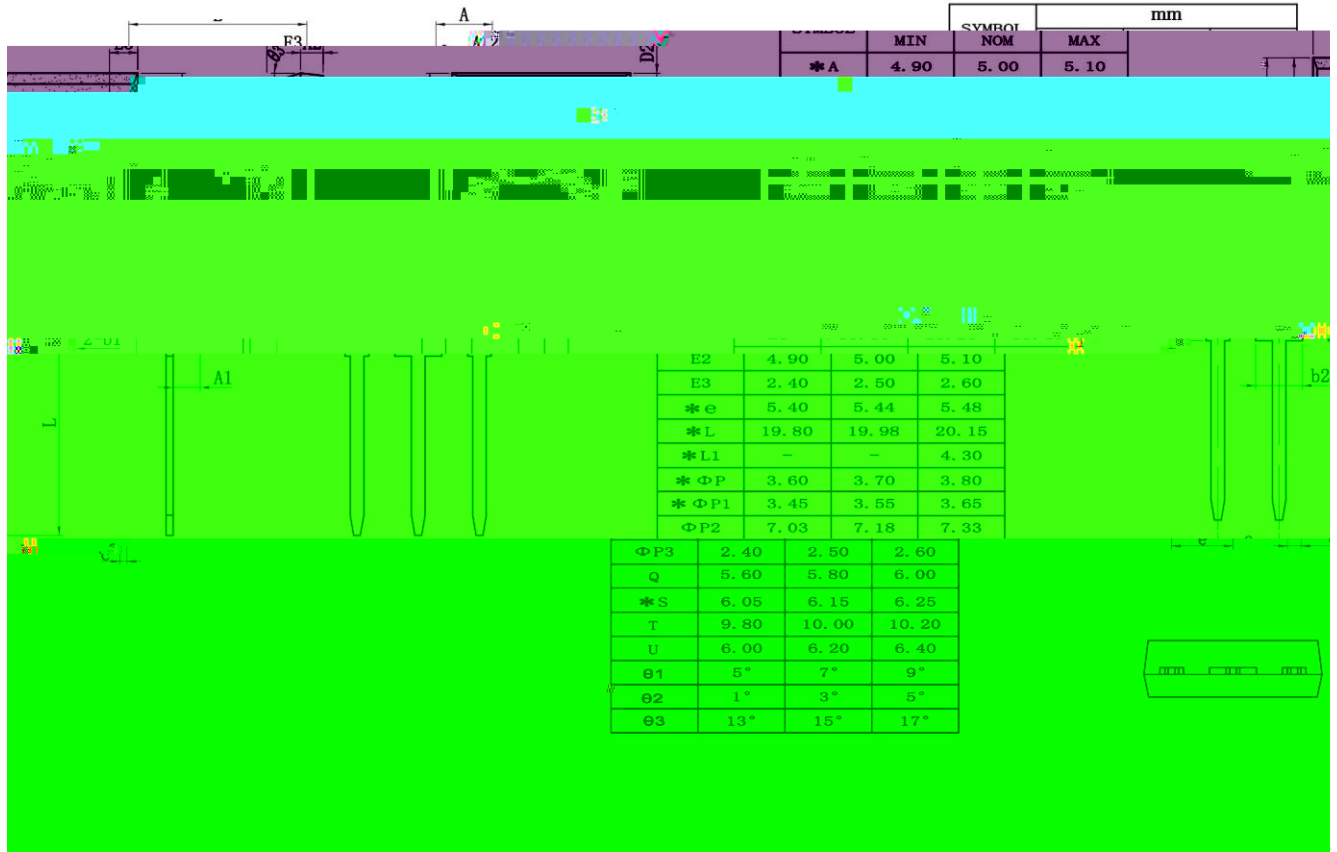
Figure 10. Forward Bias Safe Operating Area



Mechanical Data

Option1:

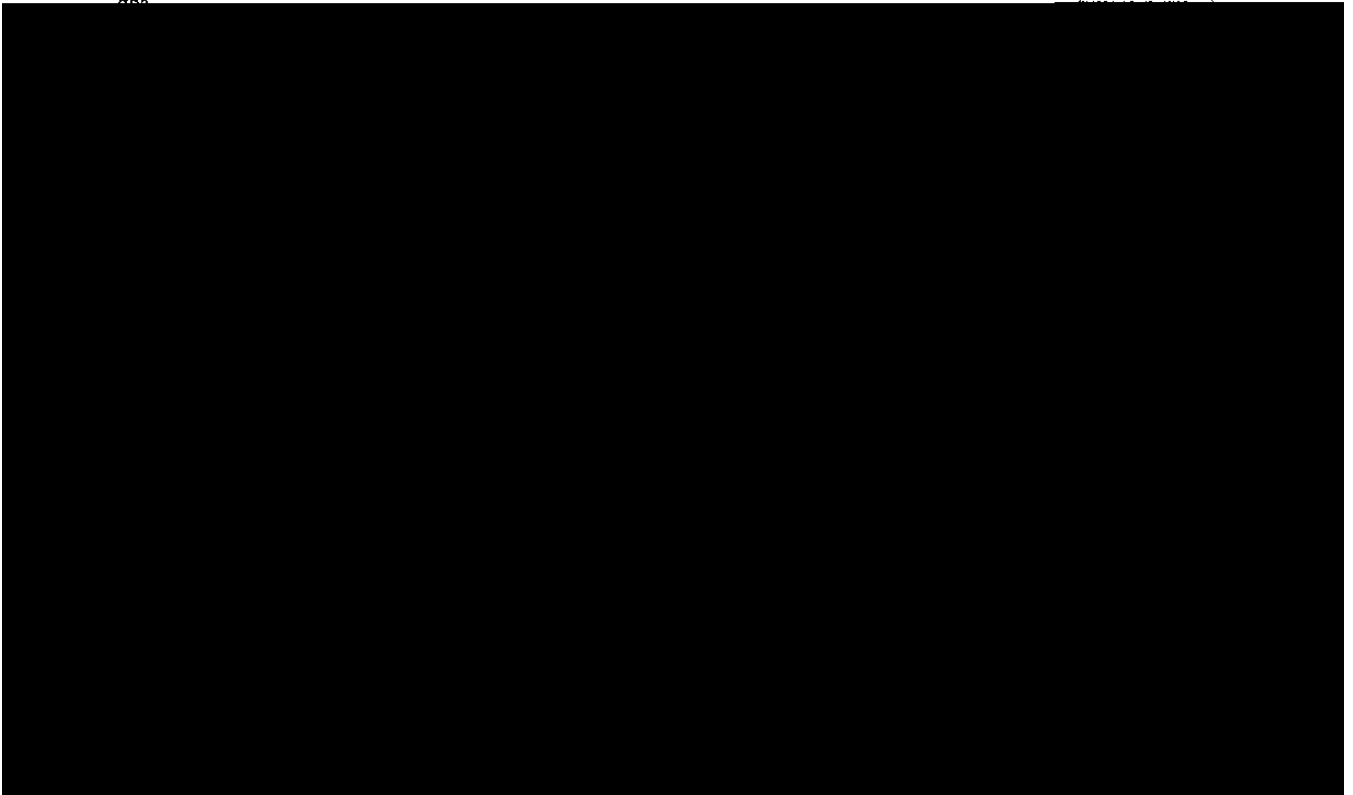
Unit:mm





Option2:

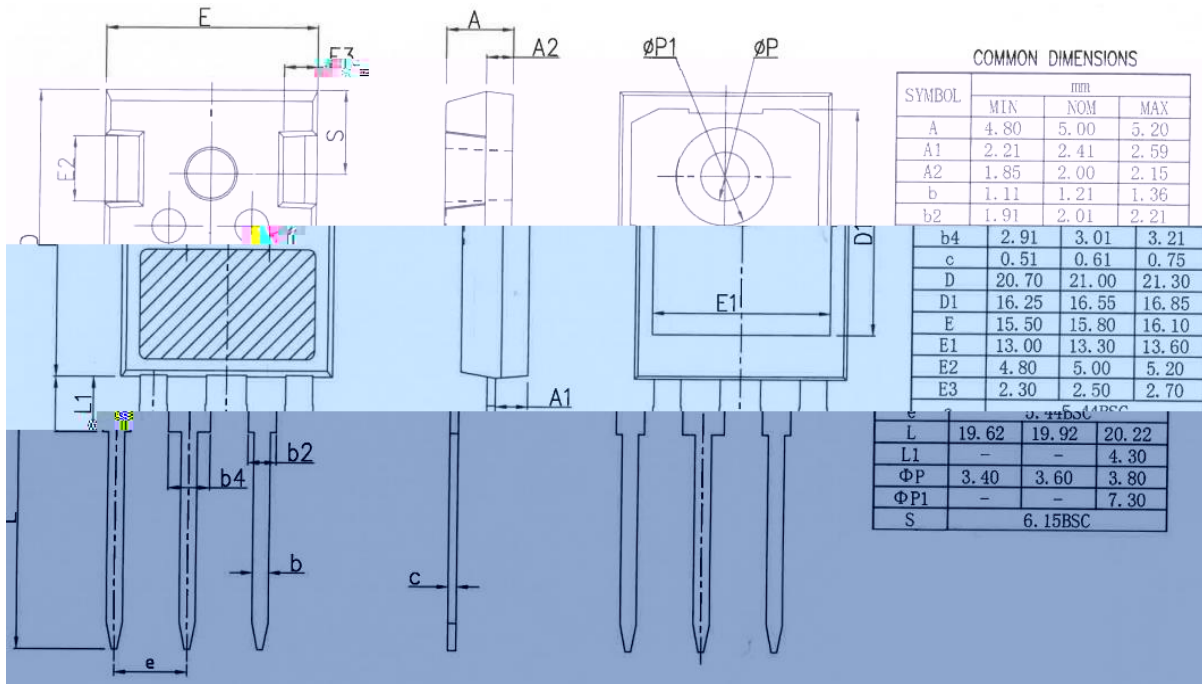
COMMON DIMENSIONS





SMG065N80E1

Option3:



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