

FEATURES

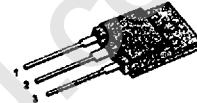
- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current : 25 μ A (Max.) @ $V_{DS} = 800V$
- Low $R_{DS(ON)}$: 0.746 Ω (Typ.)

$$BV_{DSS} = 800 V$$

$$R_{DS(on)} = 0.95 \Omega$$

$$I_D = 6.5 A$$

TO-3PF



1.Gate 2.Drain 3.Source

Absolute Maximum Ratings

| Symbol | Characteristic | Value | Units |
|----------------|---|-------------|------------|
| V_{DSS} | Drain-to-Source Voltage | 800 | V |
| I_D | Continuous Drain Current ($T_c=25^\circ C$) | 6.5 | A |
| | Continuous Drain Current ($T_c=100^\circ C$) | 4.1 | |
| I_{DM} | Drain Current-Pulsed | 40 | A |
| V_{GS} | Gate-to-Source Voltage | ± 30 | V |
| E_{AS} | Single Pulsed Avalanche Energy | 518 | mJ |
| I_{AR} | Avalanche Current | 6.5 | A |
| E_{AR} | Repetitive Avalanche Energy | 10 | mJ |
| dv/dt | Peak Diode Recovery dv/dt | 2.0 | V/ns |
| P_D | Total Power Dissipation ($T_c=25^\circ C$) | 100 | W |
| | Linear Derating Factor | 0.8 | |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | -55 to +150 | $^\circ C$ |
| T_L | Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5-seconds | 300 | |

Thermal Resistance

| Symbol | Characteristic | Typ. | Max. | Units |
|-----------------|---------------------|------|------|--------------|
| $R_{\theta JC}$ | Junction-to-Case | -- | 1.25 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction-to-Ambient | -- | 40 | |

SAMSUNG

ELECTRONICS

SSF10N80A

N-CHANNEL
POWER MOSFET

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

| Symbol | Characteristic | Min. | Typ. | Max. | Units | Test Condition |
|------------------------|---|------|------|------|---------------|--|
| BV_{DSS} | Drain-Source Breakdown Voltage | 800 | -- | -- | V | $V_{GS}=0V, I_D=250\ \mu\text{A}$ |
| $\Delta BV/\Delta T_J$ | Breakdown Voltage Temp. Coeff. | -- | 1.02 | -- | V/°C | $I_D=250\ \mu\text{A}$ See Fig 7 |
| $V_{GS(th)}$ | Gate Threshold Voltage | 2.0 | -- | 3.5 | V | $V_{DS}=5V, I_D=250\ \mu\text{A}$ |
| I_{GSS} | Gate-Source Leakage, Forward | -- | -- | 100 | nA | $V_{GS}=30V$ |
| | Gate-Source Leakage, Reverse | -- | -- | -100 | | $V_{GS}=-30V$ |
| I_{DSS} | Drain-to-Source Leakage Current | -- | -- | 25 | μA | $V_{DS}=700V$ |
| | | -- | -- | 250 | | $V_{DS}=560V, T_C=125^\circ\text{C}$ |
| $R_{DS(on)}$ | Static Drain-Source On-State Resistance | -- | -- | 0.95 | Ω | $V_{GS}=10V, I_D=3A$ * |
| g_{fs} | Forward Transconductance | -- | 6.6 | -- | | $V_{DS}=50V, I_D=3A$ |
| C_{iss} | Input Capacitance | -- | 2700 | 3500 | pF | $V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$ See Fig 5 |
| C_{oss} | Output Capacitance | -- | 260 | 300 | | |
| C_{rss} | Reverse Transfer Capacitance | -- | 110 | 130 | | |
| $t_{d(on)}$ | Turn-On Delay Time | -- | 29 | 70 | ns | $V_{DD}=350V, I_D=6A,$ $R_G=11.5\Omega$ See Fig 13 |
| t_r | Rise Time | -- | 58 | 125 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | -- | 152 | 315 | | |
| t_f | Fall Time | -- | 48 | 105 | | |
| Q_g | Total Gate Charge | -- | 125 | 165 | nC | $V_{DS}=560V, V_{GS}=10V,$ $I_D=6A$ See Fig 6 & Fig 12 |
| Q_{gs} | Gate-Source Charge | -- | 19.2 | -- | | |
| Q_{gd} | Gate-Drain(Filler) Charge | -- | 55.4 | -- | | |

Source-Drain Diode Ratings and Characteristics

| Symbol | Characteristic | Min. | Typ. | Max. | Units | Test Condition |
|----------|---------------------------|------|-------|------|---------------|---|
| I_S | Continuous Source Current | -- | -- | 6.5 | A | Integral reverse pn-diode in the MOSFET |
| I_{SM} | Pulsed-Source Current | -- | -- | 40 | | |
| V_{SD} | Diode Forward Voltage | -- | -- | 1.4 | V | $T_J=25^\circ\text{C}, I_S=6A, V_{GS}=0V$ |
| t_{rr} | Reverse Recovery Time | -- | 620 | -- | ns | $T_J=25^\circ\text{C}, I_F=6A$ |
| Q_{rr} | Reverse Recovery Charge | -- | 10.17 | -- | μC | $di_F/dt=100A/\mu\text{s}$ |

Notes :

- Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- $L=23\text{mH}, I_{AS}=6.5A, V_{DD}=50V, R_G=27\Omega$, Starting $T_J=25^\circ\text{C}$
- $I_{SD} \leq 6A, di/dt \leq 200A/\mu\text{s}, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$
- Pulse Test : Pulse Width = $250\mu\text{s}$, Duty Cycle $\leq 2\%$
- Essentially Independent of Operating Temperature

Fig 1. Output Characteristics

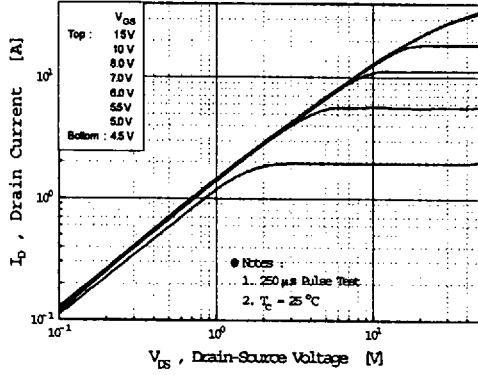


Fig 2. Transfer Characteristics

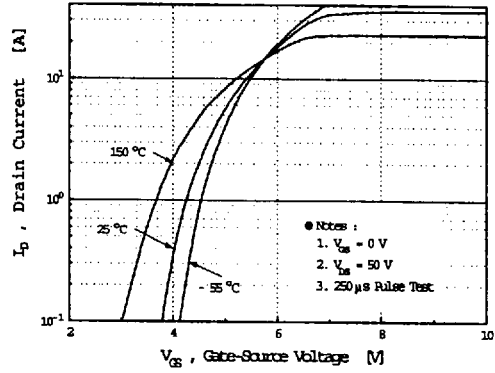


Fig 3. On-Resistance vs. Drain Current

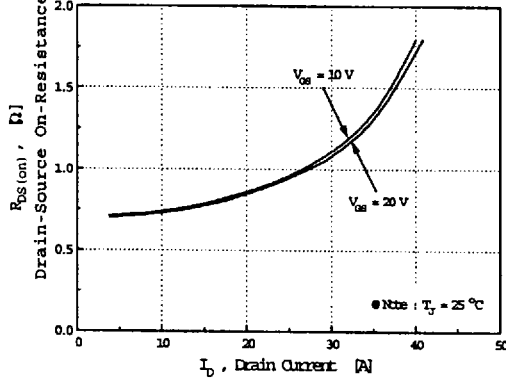


Fig 4. Source-Drain Diode Forward Voltage

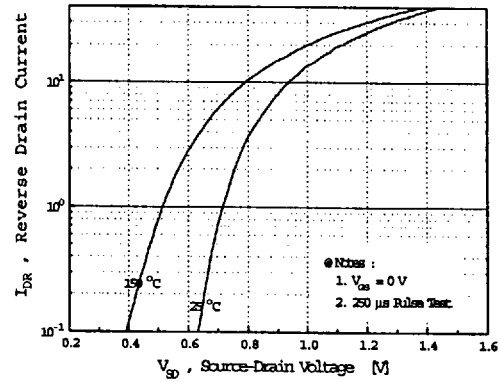


Fig 5. Capacitance vs. Drain-Source Voltage

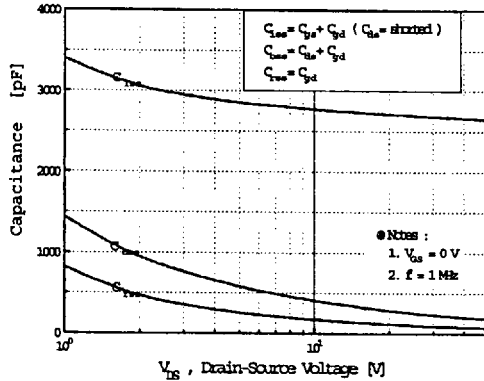
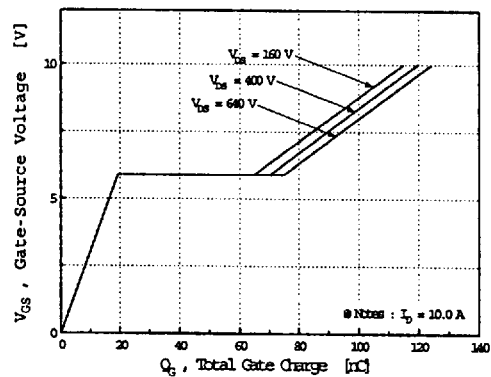


Fig 6. Gate Charge vs. Gate-Source Voltage



SSF10N80A

N-CHANNEL
POWER MOSFET

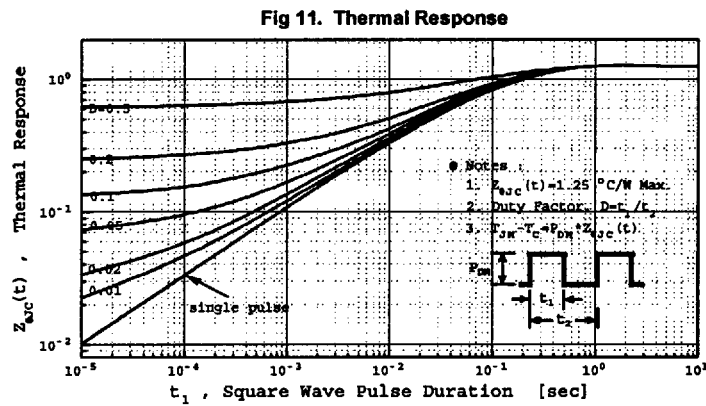
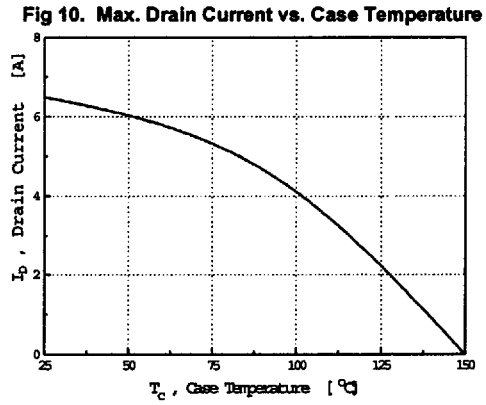
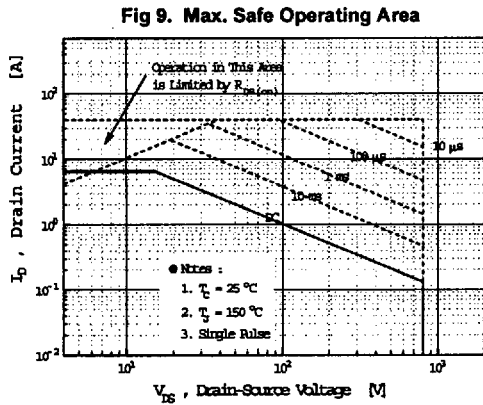
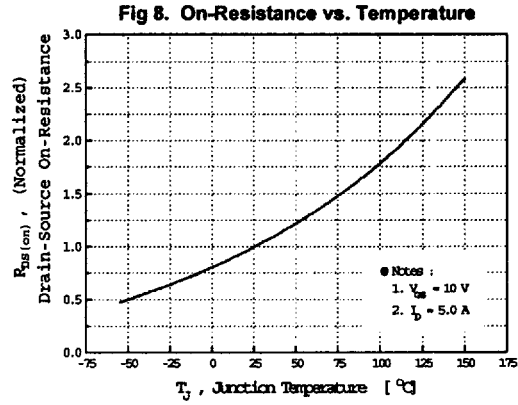
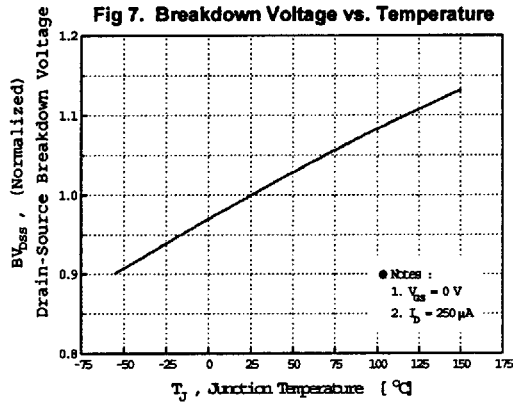


Fig 12. Gate Charge Test Circuit & Waveform

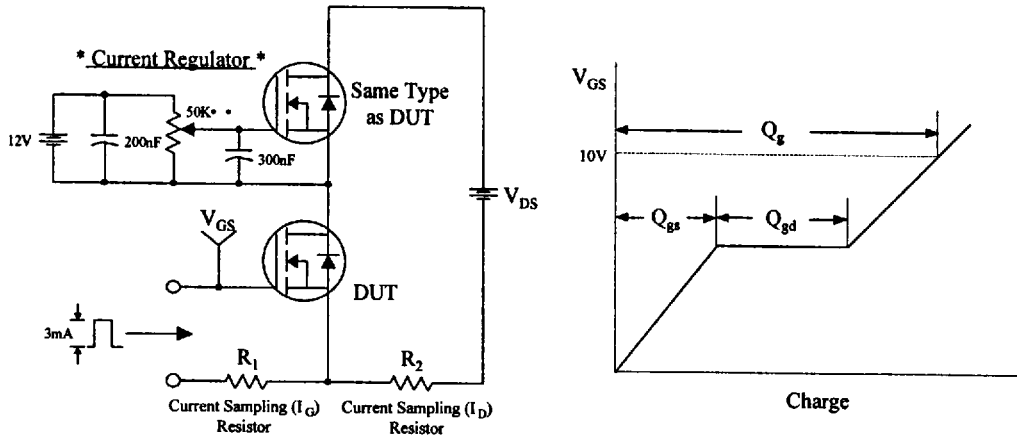


Fig 13. Resistive Switching Test Circuit & Waveforms

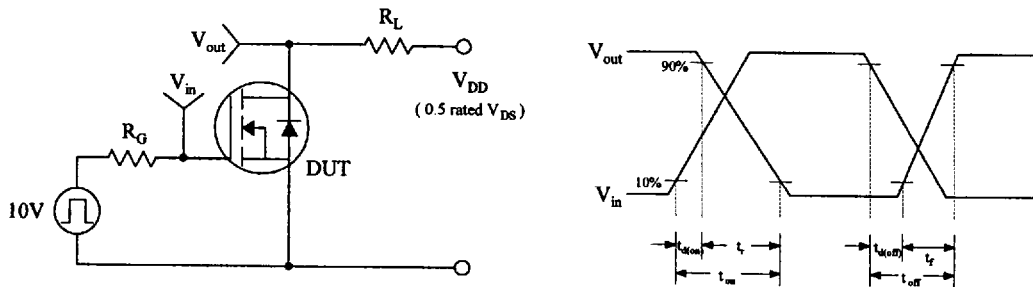


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

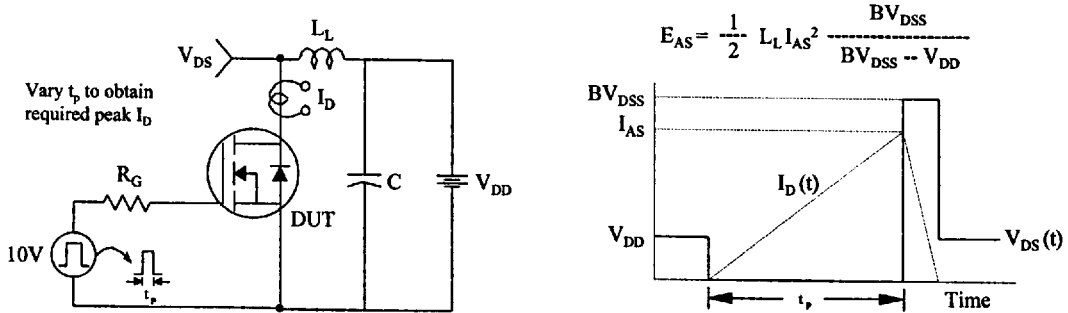
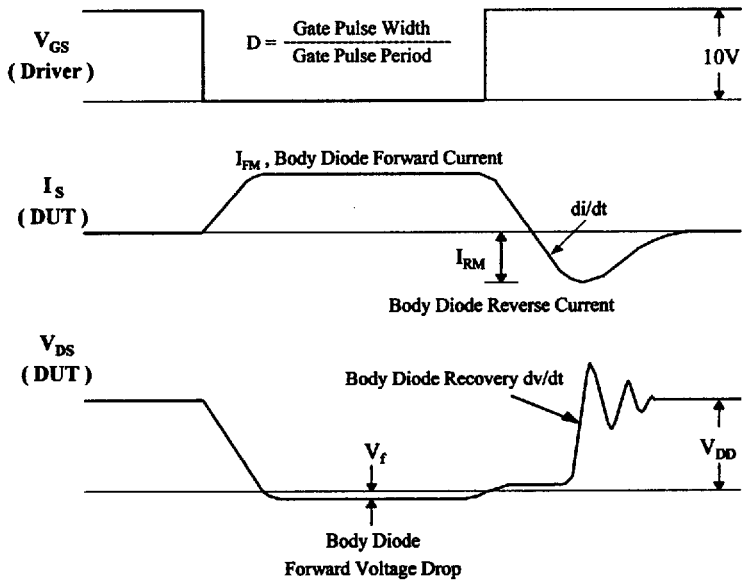
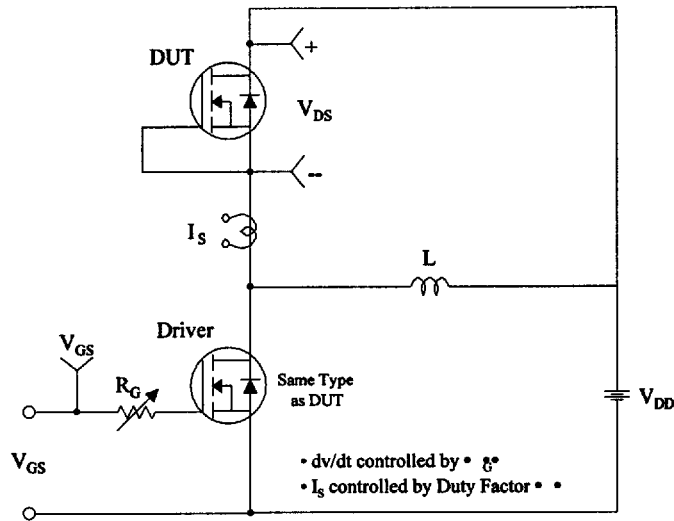
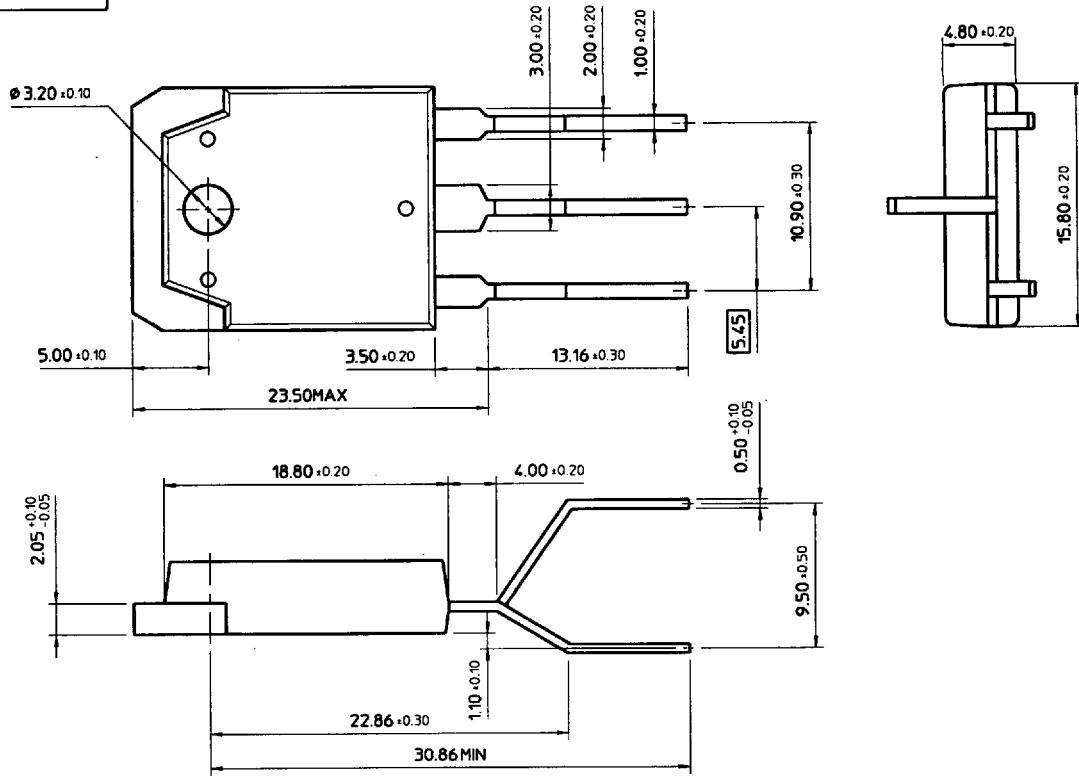


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

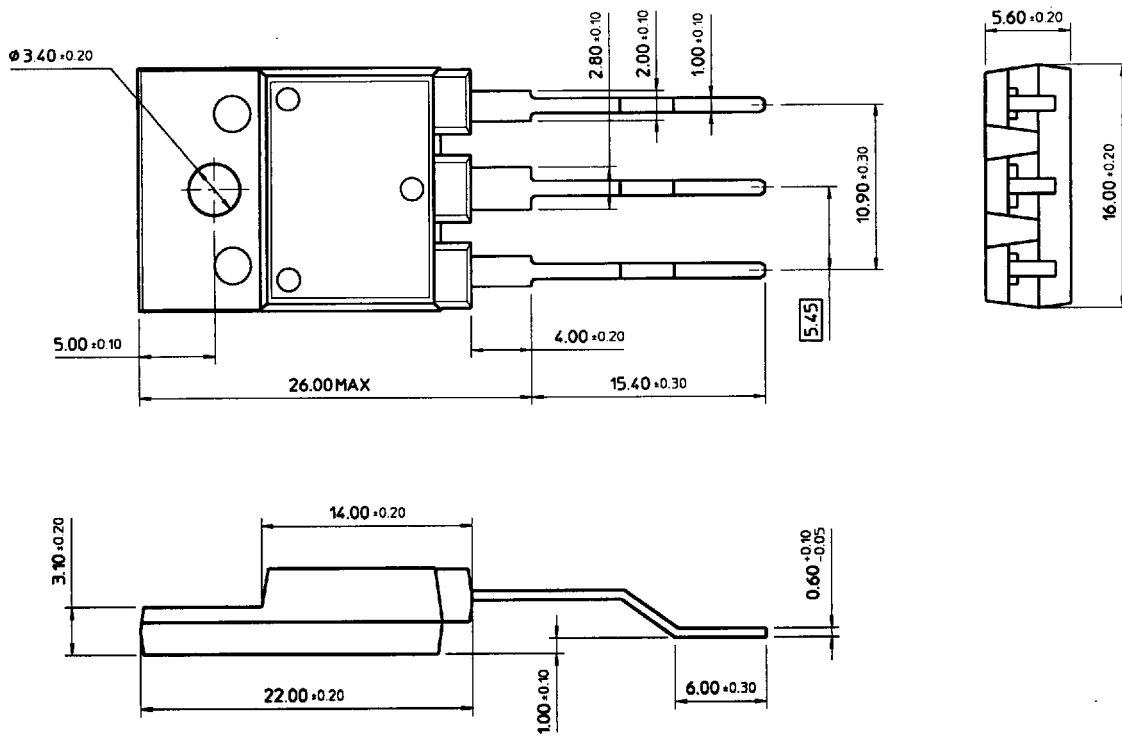


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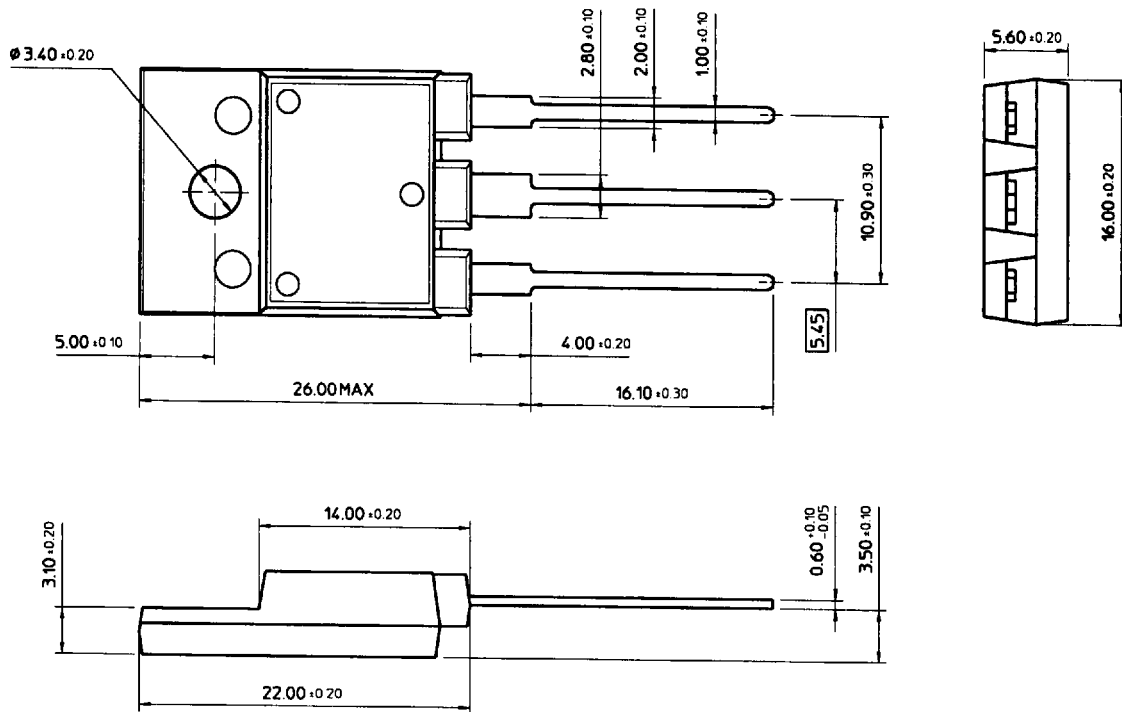
TO-3P (2)



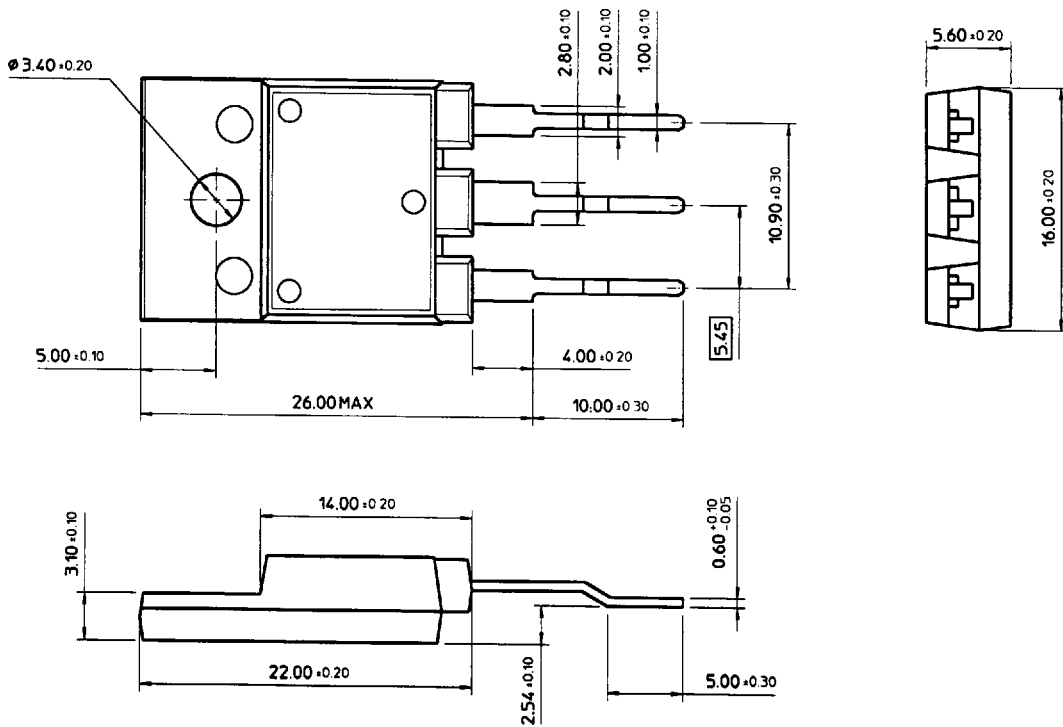
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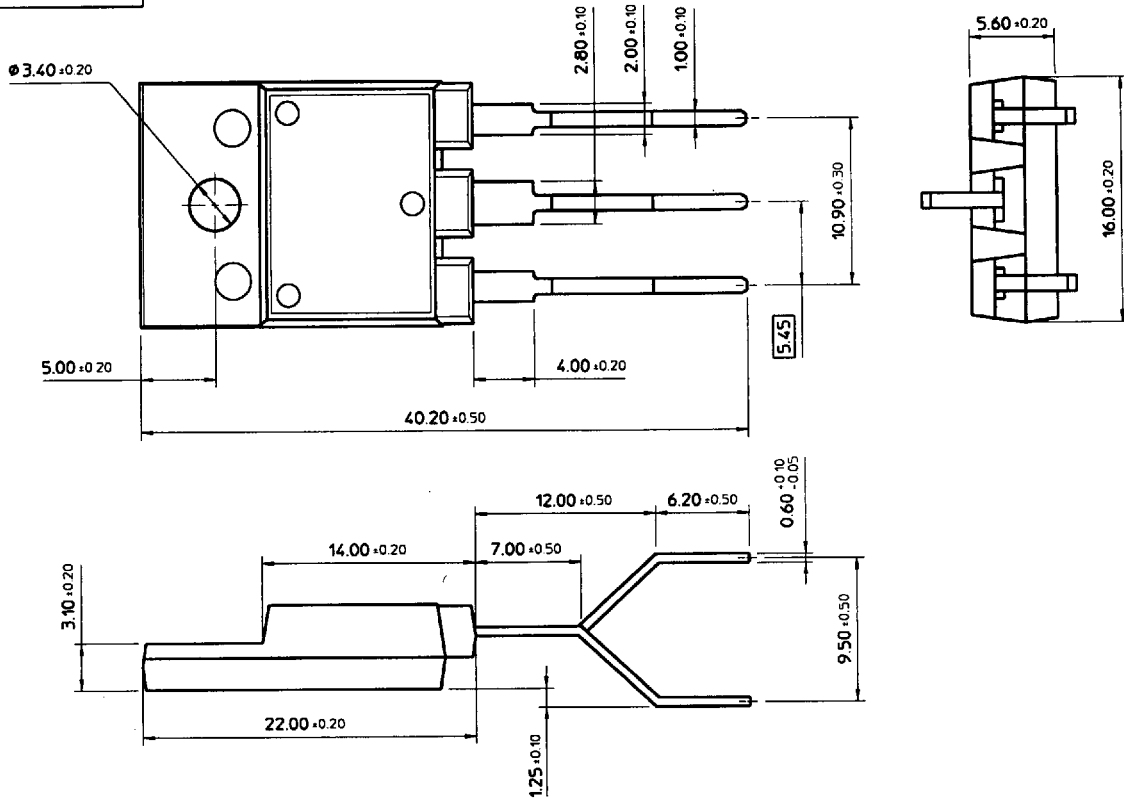
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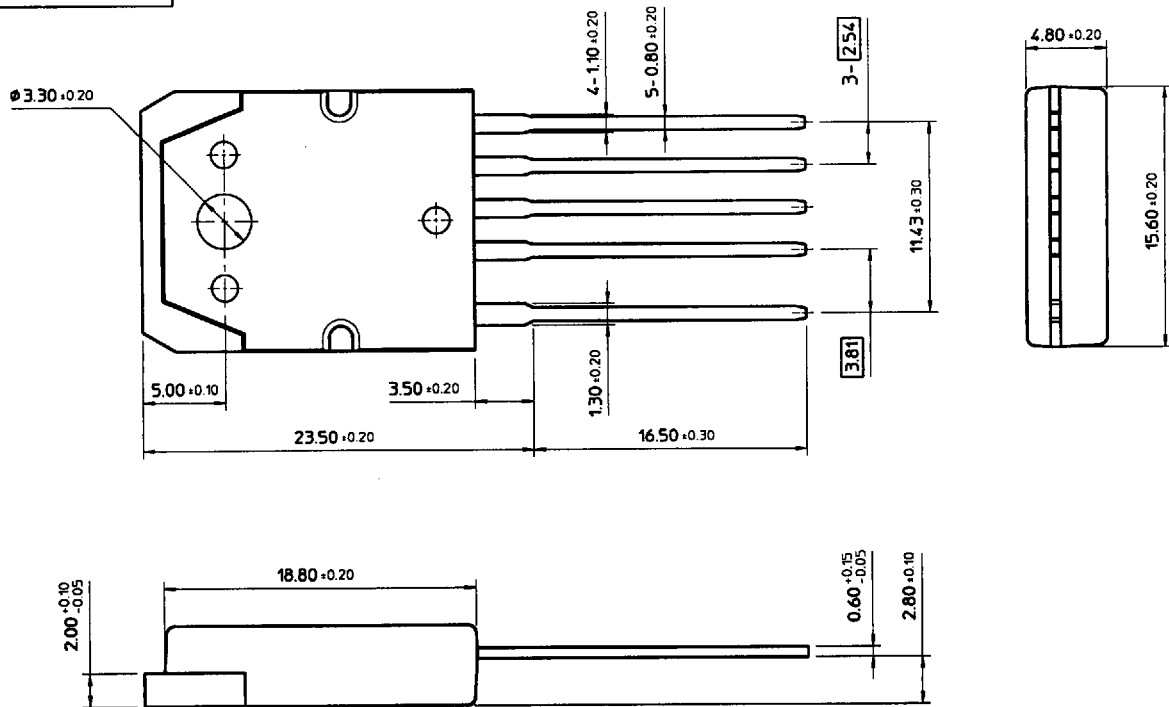
TO-3PF (3)



TO-3PF (4)



TO-3P-5L



Under Development