

## P-Channel Enhancement Mode Power MOSFET

### Description

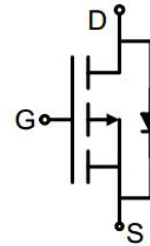
The G085P02TS uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge. It can be used in a wide variety of applications.

### General Features

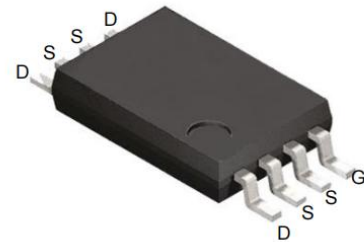
- $V_{DS}$  -20V
- $I_D$  (at  $V_{GS} = -10V$ ) -8.2A
- $R_{DS(ON)}$  (at  $V_{GS} = -4.5V$ ) < 8.5m $\Omega$
- $R_{DS(ON)}$  (at  $V_{GS} = -2.5V$ ) < 11m $\Omega$
- $R_{DS(ON)}$  (at  $V_{GS} = -1.8V$ ) < 14m $\Omega$
- 100% Avalanche Tested
- RoHS Compliant

### Application

- Power switch
- DC/DC converters



Schematic diagram



TSSOP-8

### Ordering Information

| Device    | Package | Marking | Packaging    |
|-----------|---------|---------|--------------|
| G085P02TS | TSSOP-8 | G085P02 | 5000pcs/Reel |

### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ , unless otherwise noted

| Parameter  | Symbol         | Value      | Unit             |
|--|----------------|------------|------------------|
| Drain-Source Voltage                             | $V_{DS}$       | -20        | V                |
| Continuous Drain Current                         | $I_D$          | -8.2       | A                |
| Pulsed Drain Current (note1)                     | $I_{DM}$       | -32.8      | A                |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 8$    | V                |
| Power Dissipation                                | $P_D$          | 1.05       | W                |
| Operating Junction and Storage Temperature Range | $T_J, T_{stg}$ | -55 To 150 | $^\circ\text{C}$ |

### Thermal Resistance

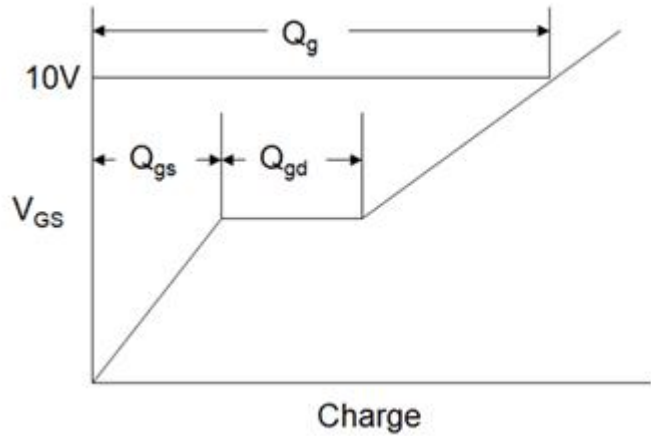
| Parameter                               | Symbol     | Value | Unit               |
|---|------------|-------|--------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{thJA}$ | 119   | $^\circ\text{C/W}$ |

| Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted |               |   |       |      |           |            |
|--|---------------|---|-------|------|-----------|------------|
| Parameter  | Symbol        | Test Conditions                                       | Value |      |           | Unit       |
|  |               |   | Min.  | Typ. | Max.      |            |
| <b>Static Parameters</b>   |               |   |       |      |           |            |
| Drain-Source Breakdown Voltage                                   | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$                        | -20   | --   | --        | V          |
| Zero Gate Voltage Drain Current                                  | $I_{DSS}$     | $V_{DS} = -20V, V_{GS} = 0V$                          | --    | --   | -1        | $\mu A$    |
| Gate-Source Leakage  | $I_{GSS}$     | $V_{GS} = \pm 8V$                                     | --    | --   | $\pm 100$ | nA         |
| Gate-Source Threshold Voltage                                    | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$                    | -0.55 | --   | -0.9      | V          |
| Drain-Source On-Resistance                                       | $R_{DS(on)}$  | $V_{GS} = -4.5V, I_D = -4.2A$                         | --    | 7.0  | 8.5       | m $\Omega$ |
|  |               | $V_{GS} = -2.5V, I_D = -3.2A$                         | --    | 8.0  | 11        |            |
|  |               | $V_{GS} = -1.8V, I_D = -2.2A$                         | --    | 10   | 14        |            |
| Forward Transconductance   | $g_{FS}$      | $V_{DS} = -5V, I_D = -4.1A$                           | 6     | --   | --        | S          |
| <b>Dynamic Parameters</b>  |               |   |       |      |           |            |
| Input Capacitance  | $C_{iss}$     | $V_{GS} = 0V,$<br>$V_{DS} = -10V,$<br>$f = 1.0MHz$    | --    | 1255 | --        | pF         |
| Output Capacitance   | $C_{oss}$     |   | --    | 220  | --        |            |
| Reverse Transfer Capacitance                                     | $C_{rss}$     |   | --    | 190  | --        |            |
| Total Gate Charge  | $Q_g$         | $V_{DD} = -10V,$<br>$I_D = -8A,$<br>$V_{GS} = -10V$   | --    | 29   | --        | nC         |
| Gate-Source Charge   | $Q_{gs}$      |   | --    | 5.2  | --        |            |
| Gate-Drain Charge  | $Q_{gd}$      |   | --    | 6.3  | --        |            |
| Turn-on Delay Time   | $t_{d(on)}$   | $V_{DD} = -10V,$<br>$I_D = -3.3A,$<br>$R_G = 1\Omega$ | --    | 230  | --        | ns         |
| Turn-on Rise Time  | $t_r$         |   | --    | 800  | --        |            |
| Turn-off Delay Time  | $t_{d(off)}$  |   | --    | 3000 | --        |            |
| Turn-off Fall Time   | $t_f$         |   | --    | 2000 | --        |            |
| <b>Drain-Source Body Diode Characteristics</b>                   |               |   |       |      |           |            |
| Continuous Body Diode Current                                    | $I_S$         | $T_C = 25^\circ\text{C}$                              | --    | --   | -8.2      | A          |
| Body Diode Voltage   | $V_{SD}$      | $T_J = 25^\circ\text{C}, I_{SD} = -8.2A, V_{GS} = 0V$ | --    | --   | -1.2      | V          |

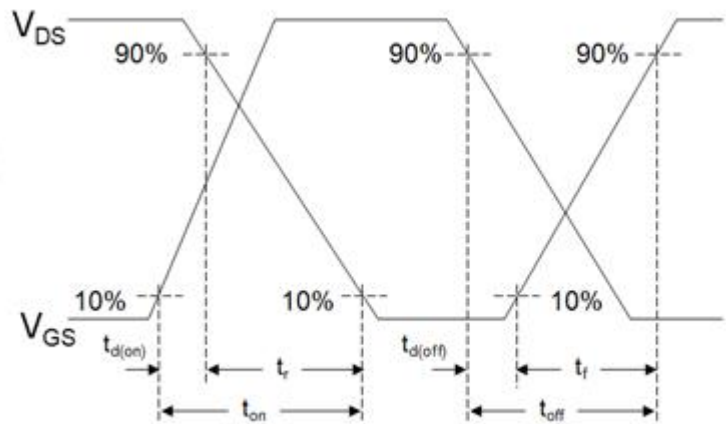
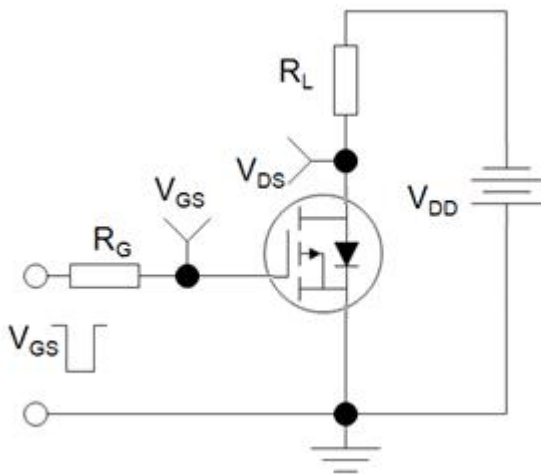
### Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$

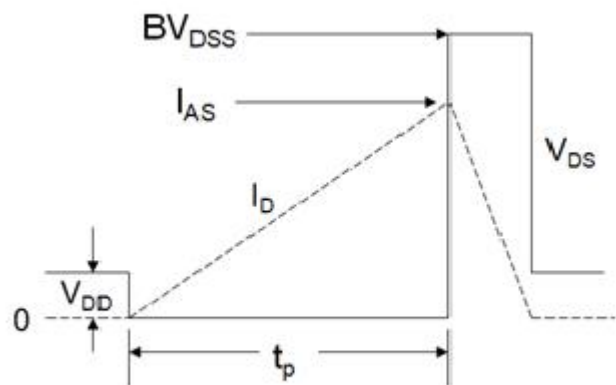
### Gate Charge Test Circuit



### Switch Time Test Circuit



### EAS Test Circuit



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 1. Output Characteristics

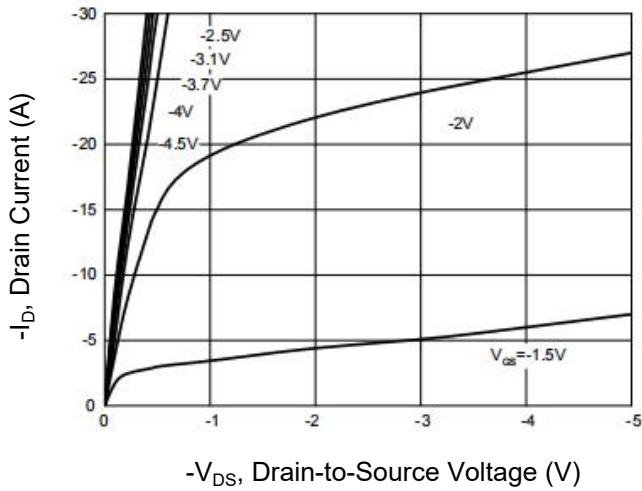


Figure 2. Transfer Characteristics

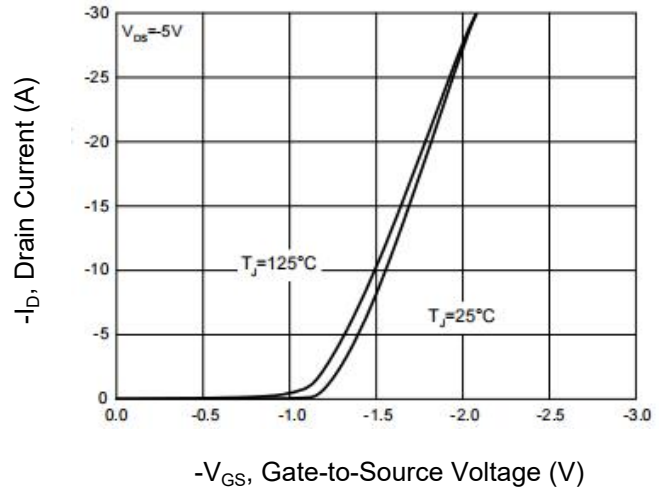


Figure 3. Drain Source On Resistance

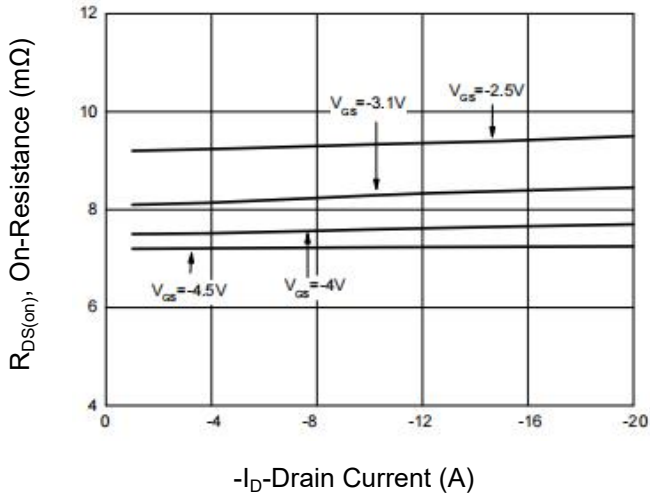


Figure 4. Gate Charge

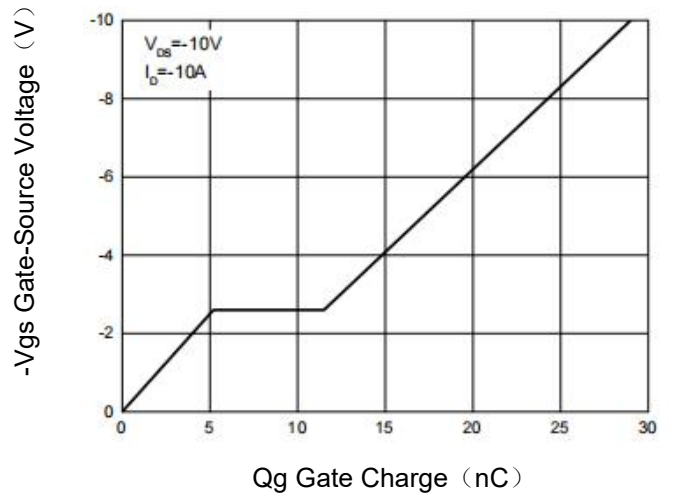


Figure 5. Capacitance

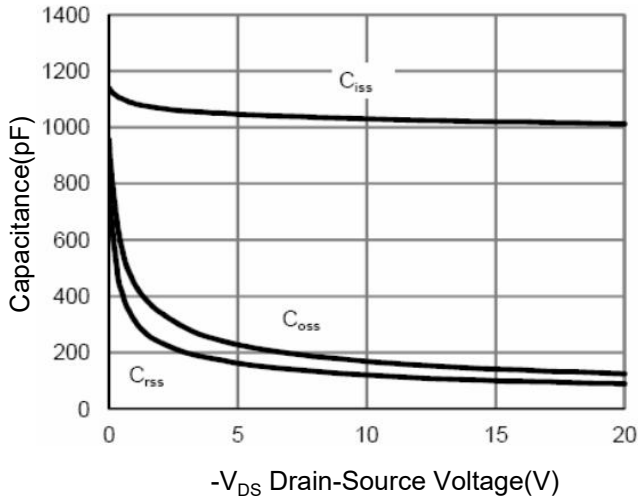
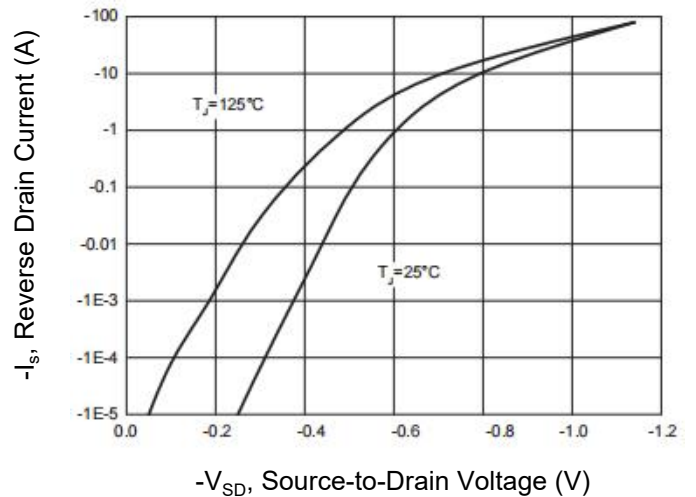


Figure 6. Source-Drain Diode Forward



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Drain-Source On-Resistance

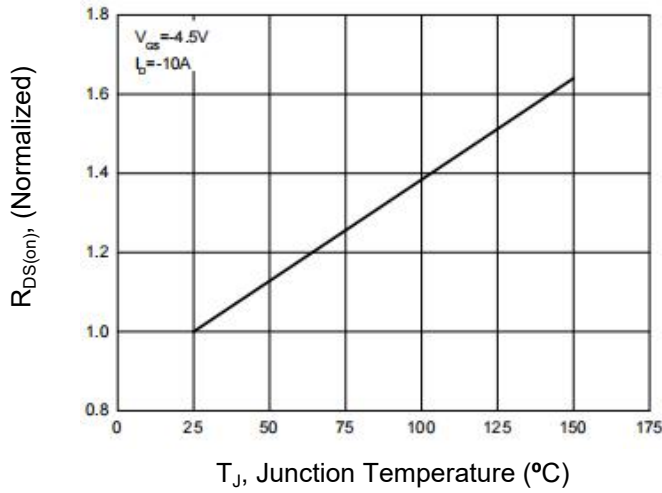


Figure 10. Safe Operation Area

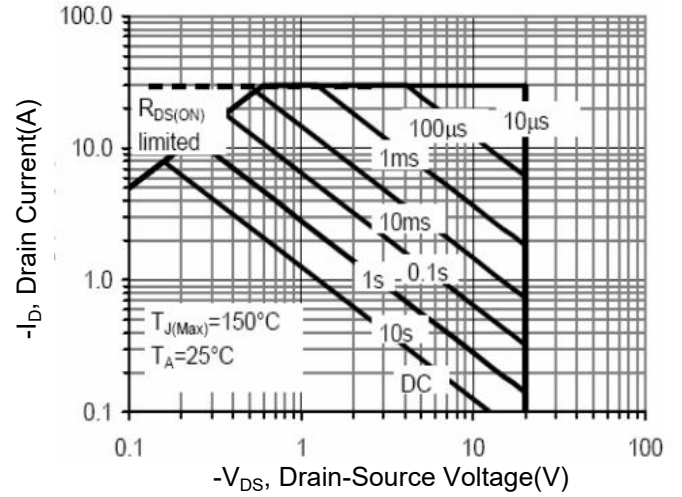
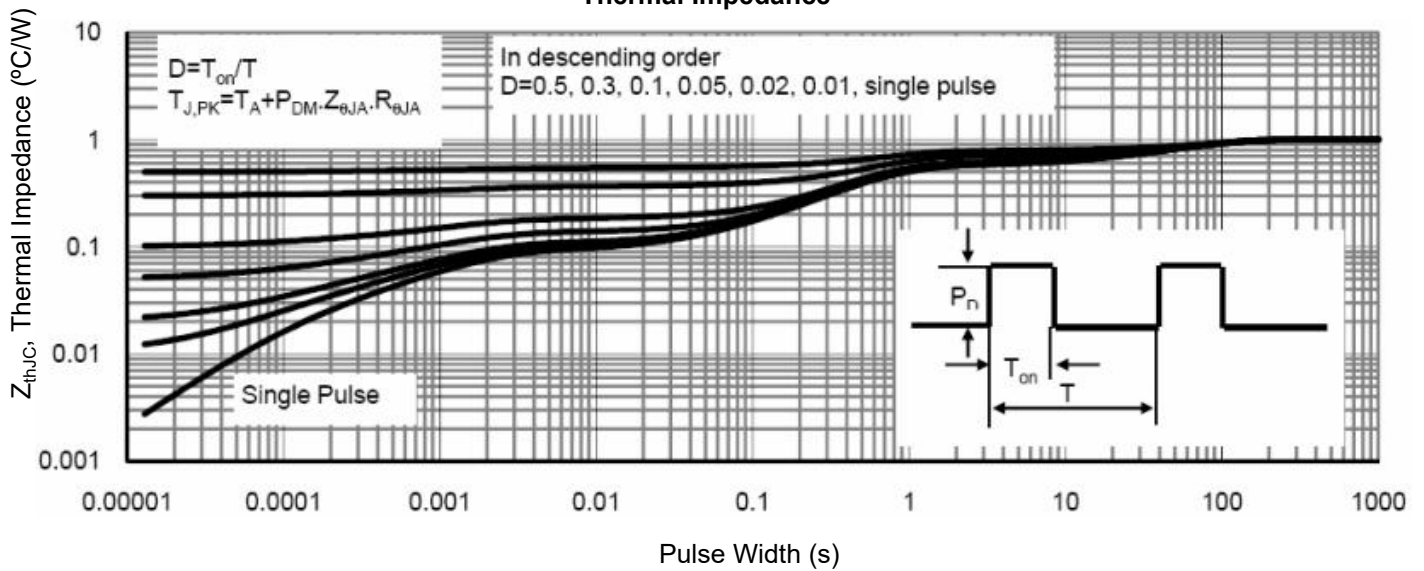
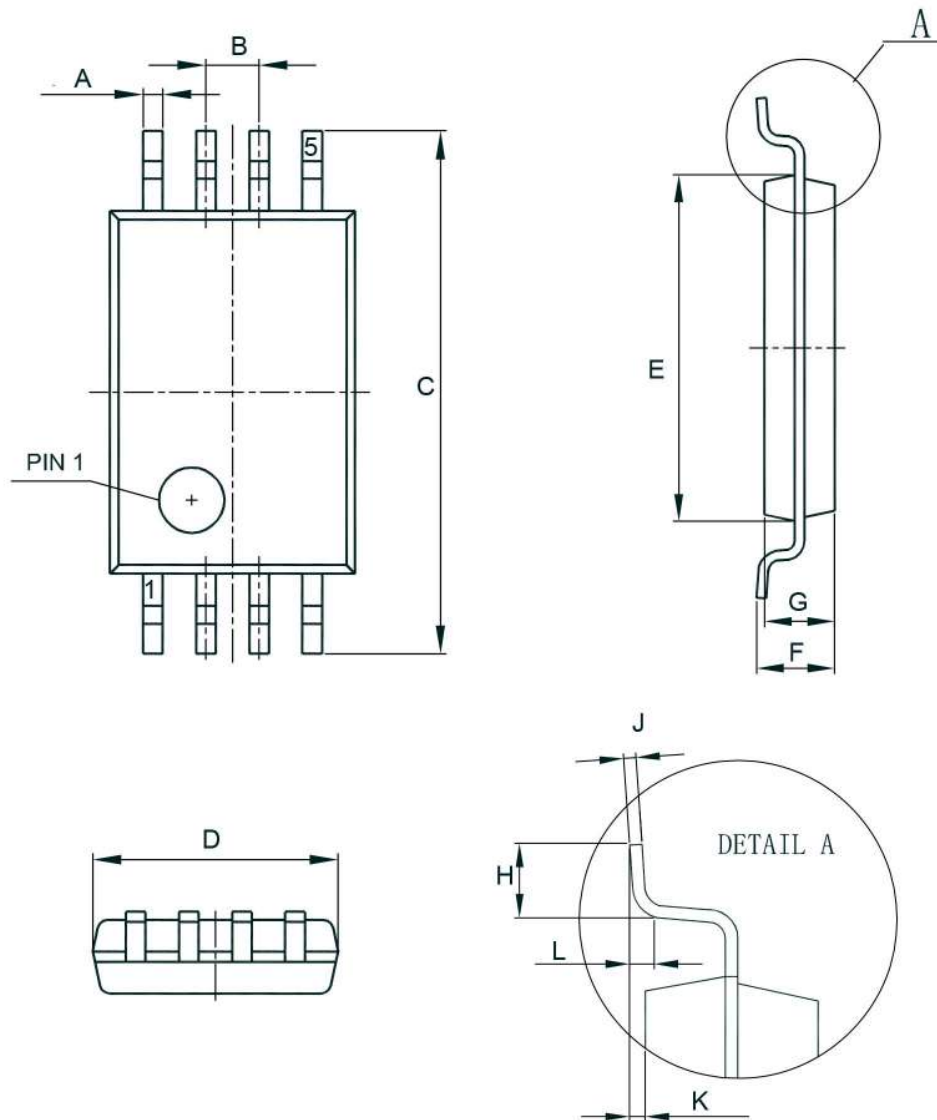


Figure 9. Normalized Maximum Transient Thermal Impedance



## TSSOP-8 Package Information



| Dimensions |           |       |           |       |      |
|------------|-----------|-------|-----------|-------|------|
| DIM        | INCHES    |       | MM        |       | NOTE |
|            | MIN       | MAX   | MIN       | MAX   |      |
| A          | 0.007     | .011  | 0.170     | 0.270 |      |
| B          | 0.026BSC. |       | 0.650BSC. |       |      |
| C          | 0.244     | 0.260 | 6.200     | 6.600 |      |
| D          | 0.112     | 0.120 | 2.850     | 3.050 |      |
| E          | 0.169     | 0.177 | 4.300     | 4.500 |      |
| F          | 0.039     | 0.047 | 1.000     | 1.200 |      |
| G          | 0.035     | 0.043 | 0.900     | 1.100 |      |
| H          | 0.016     | 0.031 | 0.400     | 0.800 |      |
| J          | 0.003     | 0.008 | 0.077     | 0.200 |      |
| K          | 0.001     | 0.007 | 0.020     | 0.180 |      |
| L          | 0.010TYP. |       | 0.250TYP. |       |      |