

SC030N65TK

55 Amps,650 Volts N-Channel Sic Power MOSFET

Features

- 55A,650V, $R_{DS(ON)MAX}=50m\ \Omega$ @ $V_{GS}=18V/25A$
- High Blocking Voltage with low On-Resistance
- High Speed Switching with Low Capacitance
- Fast Intrinsic Diode with Low Reverse Recovery(Qrr)

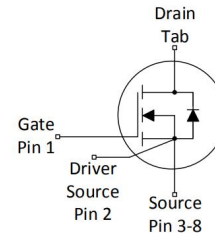
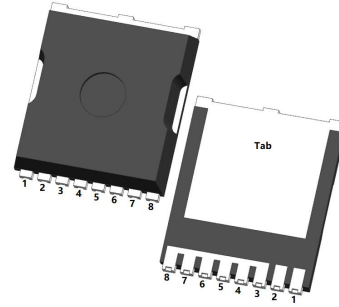
Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequencytance
- Easy to Parallel and Simple to Drive
- Enable Totem-Pole PFC Topologies

Applications

- Solar Inverters
- Server Power Supplies
- Solar PV Inverters
- UPS
- DC/DC Converters

TOLL-2L



Absolute Maximum Ratings($T_c=25^\circ C$, unless otherwise noted)

| Parameter | Symbol | Value | UNIT | Test Conditions |
|--|----------------|-------------|------------|---|
| Drain-Source Voltage | V_{DSmax} | 650 | V | $V_{GS}=0V, I_{DS}=100\mu A$ |
| Gate-Source Voltage(dynamic) | V_{GSmax} | -8/+22 | | Absolute maximum values |
| Gate-Source Voltage (static) | V_{GSop} | -4/+18 | | Recommended operational values |
| Continuous Drain Current | I_D | 55 | A | $V_{GS}=18V, T_c=25^\circ C$ |
| | | 39 | | $V_{GS}=18V, T_c=100^\circ C$ |
| Pulsed Drain Current | $I_{D(pulse)}$ | 197 | A | Pulse width t_p limited by T_{Jmax} |
| Power Dissipation | P_D | 187 | W | $T_c=25^\circ C, T_J=175^\circ C$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -40 to +175 | $^\circ C$ | |

Thermal Characteristics

| Parameter | Symbol | SC030N65TK | Units |
|--------------------------|------------|------------|--------------|
| Typical Junction-to-Case | R_{thJC} | 0.8 | $^\circ C/W$ |

| Electrical Characteristics ($T_c=25^\circ\text{C}$, unless otherwise noted) | | | | | | |
|--|--------------|--|-----|------|-----|------------|
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=100\mu A$ | 650 | — | — | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=650V, V_{GS}=0V$ | — | 1 | 50 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=22V, V_{DS}=0V$ | — | 10 | 250 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=10mA$ | 1.8 | 2.6 | 4.3 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=18V, I_D=25A$ | — | 30 | 50 | m Ω |
| | | $V_{GS}=18V, I_D=25A, T_J=175^\circ\text{C}$ | — | 42 | — | |
| Input Capacitance | C_{iss} | $V_{DS}=400V, V_{GS}=0V,$ $f=1.0MHz, V_{AC}=25mV$ | — | 2000 | — | pF |
| Output Capacitance | C_{oss} | | — | 180 | — | pF |
| Reverse Transfer Capacitance | C_{rss} | | — | 19 | — | pF |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}=400V, V_{GS}=-4V/18V,$ $I_D=25A, R_g=2.5\Omega, R_L=16\Omega$ | — | 14 | — | ns |
| Turn-On Rise Time | t_r | | — | 15 | — | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | — | 28 | — | ns |
| Turn-Off Fall Time | t_f | | — | 8 | — | ns |
| Turn-On Switching Energy | E_{ON} | $V_{DS}=400V, V_{GS}=-4V/18V$ | — | 50 | — | μJ |
| Turn-Off Switching Energy | E_{OFF} | $I_D=50A, R_g=2.5\Omega, L=100\mu H$ | — | 65 | — | μJ |
| Internal Gate Resistance | R_G | $f=1MHz, V_{AC}=25mV$ | — | 2.5 | — | Ω |
| Total Gate Charge | Q_g | $V_{DS}=400V, I_D=25A,$ $V_{GS}=-4V/18V$ | — | 110 | — | nC |
| Gate-Source Charge | Q_{gs} | | — | 30 | — | |
| Gate-Drain Charge | Q_{gd} | | — | 32 | — | |
| Reverse Diode Characteristics | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS}=-4V, I_{SD}=12.5A$ | — | 4.2 | — | V |
| | | $V_{GS}=-4V, I_{SD}=12.5A, T_J=175^\circ\text{C}$ | — | 3.8 | — | |
| Continuous Diode Forward Current | I_S | $V_{GS}=-4V, T_C=25^\circ\text{C}$ | — | — | 45 | A |
| Reverse Recover Time | t_{rr} | $V_R=400V, I_{SD}=25A$ | — | 25 | — | ns |
| Reverse Recovery Charge | Q_{rr} | | — | 100 | — | nc |
| Peak Reverse Recovery Current | I_{rrm} | | — | 5 | — | A |

RATING AND CHARACTERISTIC CURVES

Figure.1 Output Characteristics $T_j=25^\circ\text{C}$

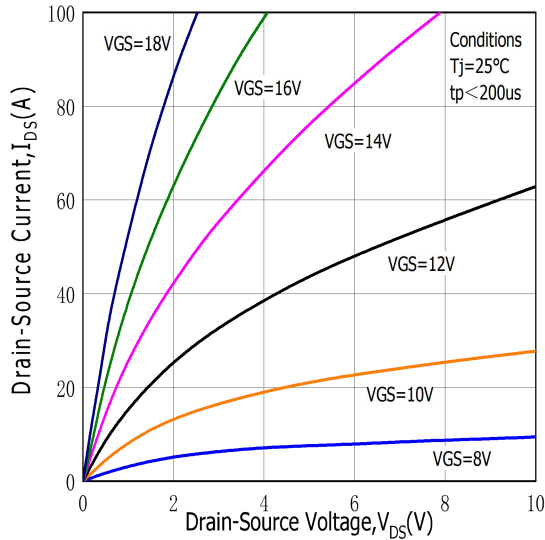


Figure.2 Output Characteristics $T_j=175^\circ\text{C}$

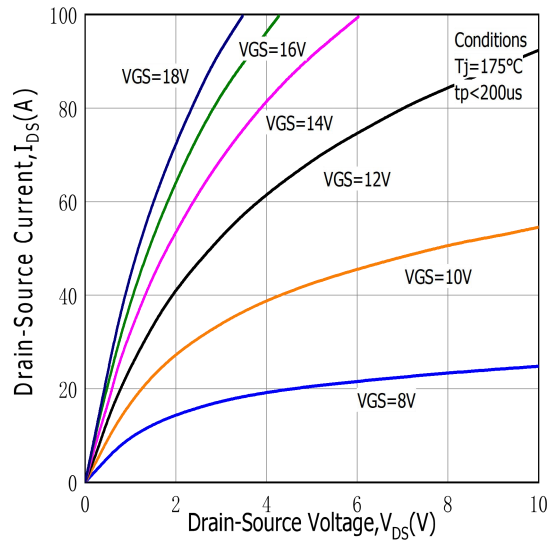


Figure.3 Normalized On-Resistance vs. Temperature

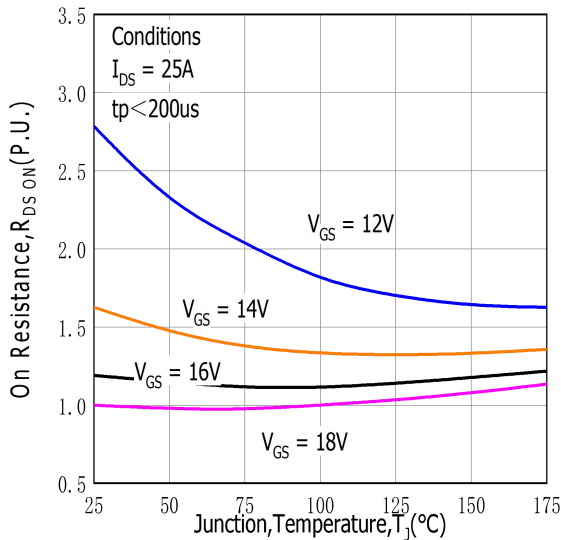


Figure.4 Body Diode Characteristic at 25°C

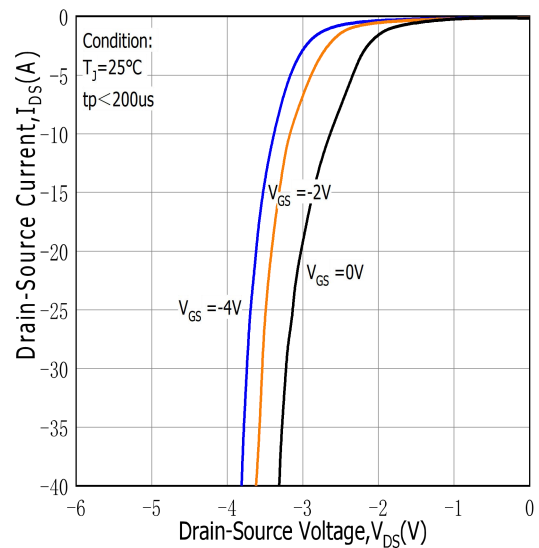


Figure.5 Body Diode Characteristic at 175°C

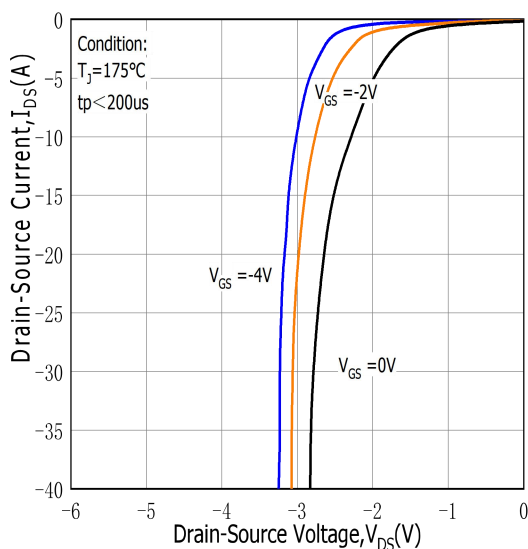


Figure.6 Threshold Voltage vs. Temperature

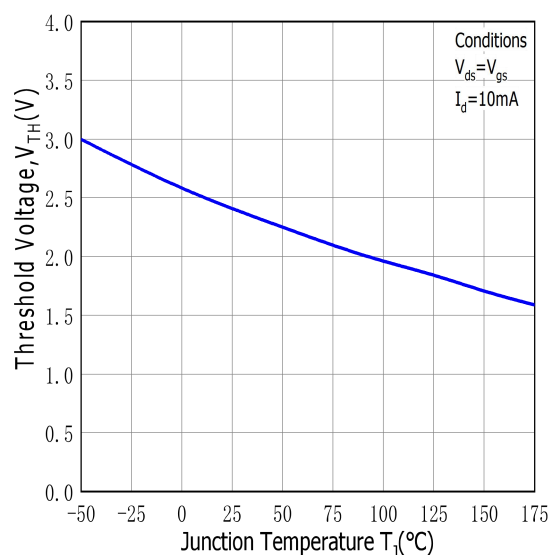


Figure.7 3rd Quadrant Characteristic at 25°C

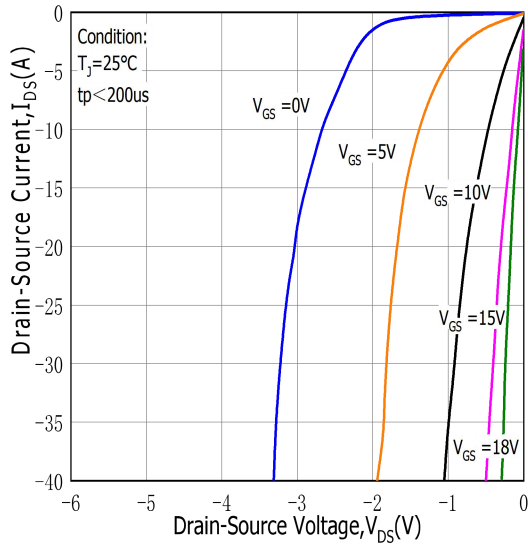


Figure.8 3rd Quadrant Characteristic at 175°C

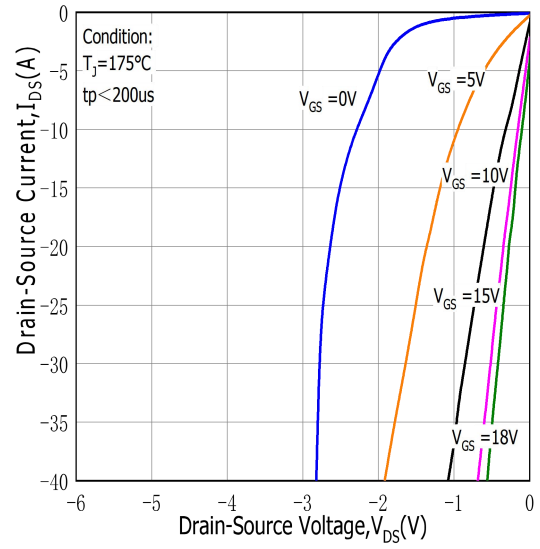


Figure.9 Capacitances vs. Drain-Source Voltage(0-200V)

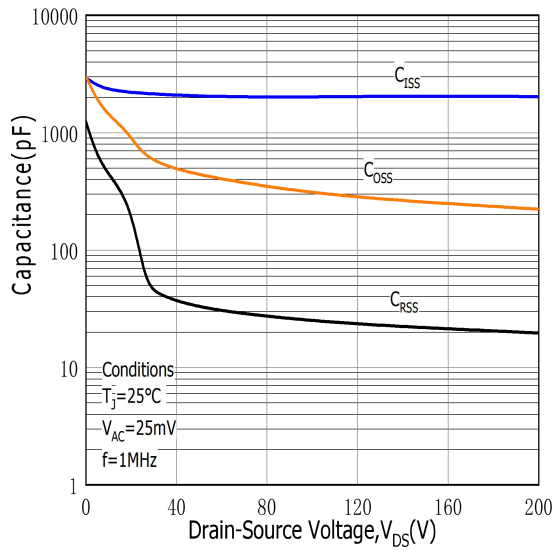
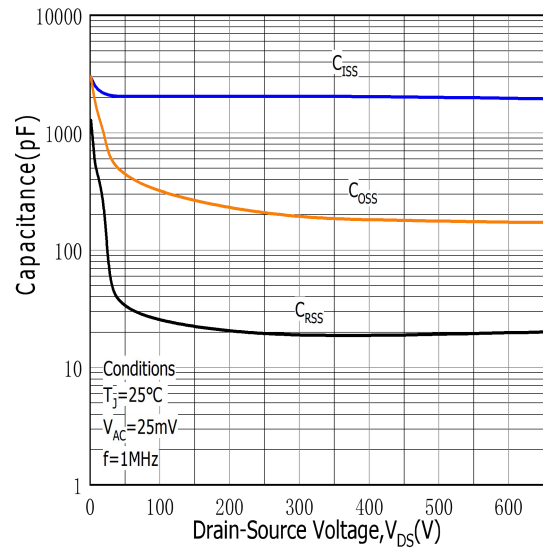
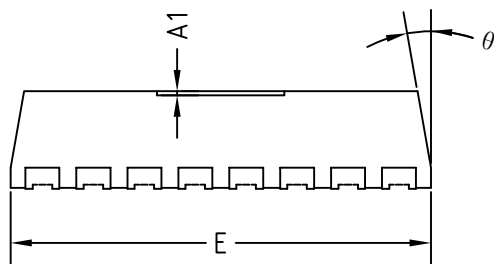
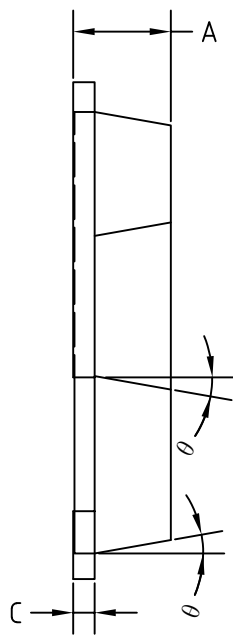
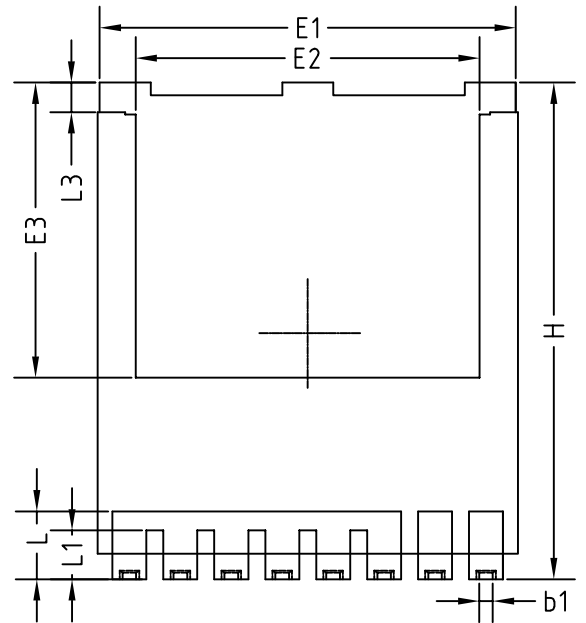
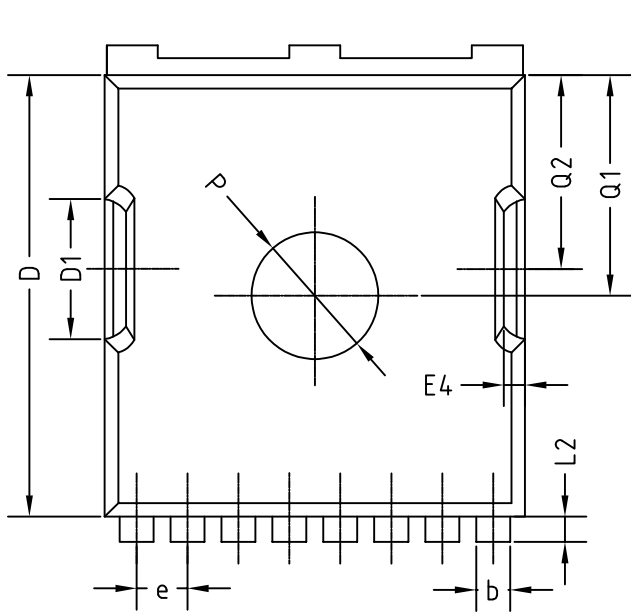


Figure.10 Capacitances vs. Drain-Source Voltage(0-1000V)



TOLL-2L PACKAGE OUTLINE



| COMMON DIMENSIONS | | | | | | |
|-------------------|-------------|-------|-------|--------|-------|-------|
| DIM | MILLIMETERS | | | INCHES | | |
| | MIN | NOR | MAX | MIN | NOR | MAX |
| A | 2.20 | 2.30 | 2.40 | 0.087 | 0.091 | 0.094 |
| A1 | 0.05 | 0.10 | 0.20 | 0.00 | 0.004 | 0.008 |
| b | 0.65 | 0.80 | 0.85 | 0.026 | 0.031 | 0.033 |
| b1 | 0.30 | 0.40 | 0.50 | 0.012 | 0.016 | 0.020 |
| C | 0.35 | 0.46 | 0.65 | 0.014 | 0.018 | 0.026 |
| D | 10.35 | 10.55 | 10.70 | 0.407 | 0.415 | 0.421 |
| D1 | 3.15 | 3.30 | 3.45 | 0.124 | 0.130 | 0.136 |
| E | 9.80 | 9.90 | 10.00 | 0.386 | 0.390 | 0.394 |
| E1 | 9.65 | 9.80 | 9.95 | 0.380 | 0.386 | 0.392 |
| E2 | 7.90 | 8.10 | 8.30 | 0.311 | 0.319 | 0.327 |
| E3 | 6.80 | 7.0 | 7.20 | 0.268 | 0.276 | 0.283 |
| E4 | 0.30 | 0.50 | 0.75 | 0.012 | 0.02 | 0.03 |
| e | 1.15 | 1.20 | 1.25 | 0.045 | 0.047 | 0.049 |
| L | 1.35 | 1.60 | 1.85 | 0.053 | 0.063 | 0.073 |
| L1 | 0.95 | 1.20 | 1.35 | 0.037 | 0.045 | 0.053 |
| L2 | 0.40 | 0.60 | 0.80 | 0.016 | 0.024 | 0.031 |
| L3 | 0.60 | 0.70 | 0.85 | 0.024 | 0.024 | 0.031 |
| θ | 7° | 10° | 12° | 7° | 10° | 12° |
| P | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |
| Q | 4.50 | 4.60 | 4.70 | 0.177 | 0.181 | 0.185 |
| Q1 | 5.10 | 5.20 | 5.30 | 0.201 | 0.205 | 0.209 |
| H | 11.55 | 11.70 | 11.95 | 0.455 | 0.461 | 0.470 |

UNIT: mm

NOTE: 测量不包含毛刺、飞边。