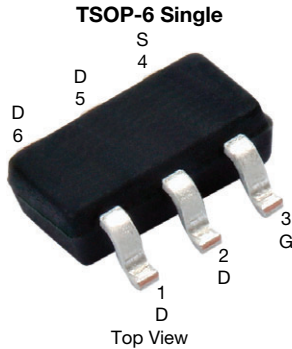


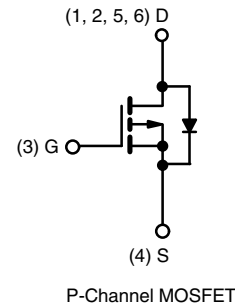
Automotive P-Channel 60 V (D-S) 175 °C MOSFET



FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified °
- 100 % R_G and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE


| PRODUCT SUMMARY | |
|---|--------|
| V _{DS} (V) | -60 |
| R _{DS(on)} (Ω) at V _{GS} = -10 V | 0.095 |
| R _{DS(on)} (Ω) at V _{GS} = -4.5 V | 0.135 |
| I _D (A) | -5.3 |
| Configuration | Single |

Marking Code: 8R

| ORDERING INFORMATION | |
|---------------------------------|--|
| Package | TSOP-6 |
| Lead (Pb)-free and halogen-free | SQ3427EV (for detailed order number please see www.vishay.com/doc?79771) |

| ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted) | | | | |
|---|-------------------------|-----------------------------------|-------------|------|
| PARAMETER | | SYMBOL | LIMIT | UNIT |
| Drain-Source Voltage | | V _{DS} | -60 | V |
| Gate-Source Voltage | | V _{GS} | ± 20 | |
| Continuous Drain Current | T _C = 25 °C | I _D | -5.3 | A |
| | T _C = 125 °C | | -3 | |
| Continuous Source Current (Diode Conduction) | | I _S | -6.3 | |
| Pulsed Drain Current ^a | | I _{DM} | -21 | |
| Single Pulse Avalanche Current | L = 0.1 mH | I _{AS} | -21 | |
| Single Pulse Avalanche Energy | | E _{AS} | 22 | |
| Maximum Power Dissipation ^a | T _C = 25 °C | P _D | 5 | W |
| | T _C = 125 °C | | 1.6 | |
| Operating Junction and Storage Temperature Range | | T _J , T _{stg} | -55 to +175 | °C |

| THERMAL RESISTANCE RATINGS | | | | |
|----------------------------|------------------------|-------------------|-------|------|
| PARAMETER | | SYMBOL | LIMIT | UNIT |
| Junction-to-Ambient | PCB Mount ^b | R _{thJA} | 110 | °C/W |
| Junction-to-Foot (Drain) | | R _{thJF} | 30 | |

Notes

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR4 material).
- Parametric verification ongoing.



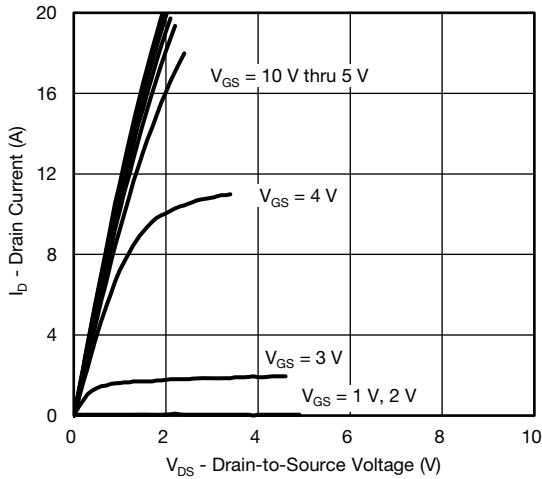
| SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted) | | | | | | | |
|---|--------------|--|--|------|-------|-----------|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
| Static | | | | | | | |
| Drain-Source Breakdown Voltage | V_{DS} | $V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$ | | -60 | - | - | V |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$ | | -1.5 | -2 | -2.5 | |
| Gate-Source Leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ | | - | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{GS} = 0\text{ V}$ | $V_{DS} = -60\text{ V}$ | - | - | -1 | μA |
| | | $V_{GS} = 0\text{ V}$ | $V_{DS} = -60\text{ V}, T_J = 125\text{ }^\circ\text{C}$ | - | - | -50 | |
| | | $V_{GS} = 0\text{ V}$ | $V_{DS} = -60\text{ V}, T_J = 175\text{ }^\circ\text{C}$ | - | - | -150 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{GS} = -10\text{ V}$ | $V_{DS} \leq -5\text{ V}$ | -10 | - | - | A |
| Drain-Source On-State Resistance ^a | $R_{DS(on)}$ | $V_{GS} = -10\text{ V}$ | $I_D = -4.5\text{ A}$ | - | 0.079 | 0.095 | Ω |
| | | $V_{GS} = -10\text{ V}$ | $I_D = -4.5\text{ A}, T_J = 125\text{ }^\circ\text{C}$ | - | - | 0.148 | |
| | | $V_{GS} = -10\text{ V}$ | $I_D = -4.5\text{ A}, T_J = 175\text{ }^\circ\text{C}$ | - | - | 0.178 | |
| | | $V_{GS} = -4.5\text{ V}$ | $I_D = -3.5\text{ A}$ | - | 0.112 | 0.135 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = -15\text{ V}, I_D = -4\text{ A}$ | | - | 9 | - | S |
| Dynamic ^b | | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0\text{ V}$ | $V_{DS} = -30\text{ V}, f = 1\text{ MHz}$ | - | 700 | 1000 | pF |
| Output Capacitance | C_{oss} | | | - | 90 | 120 | |
| Reverse Transfer Capacitance | C_{rss} | | | - | 50 | 80 | |
| Total Gate Charge ^c | Q_g | $V_{GS} = -10\text{ V}$ | $V_{DS} = -30\text{ V}, I_D = -5\text{ A}$ | - | 15.3 | 22 | nC |
| Gate-Source Charge ^c | Q_{gs} | | | - | 2.5 | - | |
| Gate-Drain Charge ^c | Q_{gd} | | | - | 5.4 | - | |
| Gate Resistance | R_g | $f = 1\text{ MHz}$ | | 2.5 | 5 | 7.5 | Ω |
| Turn-On Delay Time ^c | $t_{d(on)}$ | $V_{DD} = -30\text{ V}, R_L = 6\text{ }\Omega$ $I_D \cong -5\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$ | | - | 8 | 12 | ns |
| Rise Time ^c | t_r | | | - | 24 | 35 | |
| Turn-Off Delay Time ^c | $t_{d(off)}$ | | | - | 25 | 38 | |
| Fall Time ^c | t_f | | | - | 33 | 50 | |
| Source-Drain Diode Ratings and Characteristics ^b | | | | | | | |
| Pulsed Current ^a | I_{SM} | | | - | - | -21 | A |
| Forward Voltage | V_{SD} | $I_F = -1.6\text{ A}, V_{GS} = 0\text{ V}$ | | - | -0.8 | -1.2 | V |

Notes

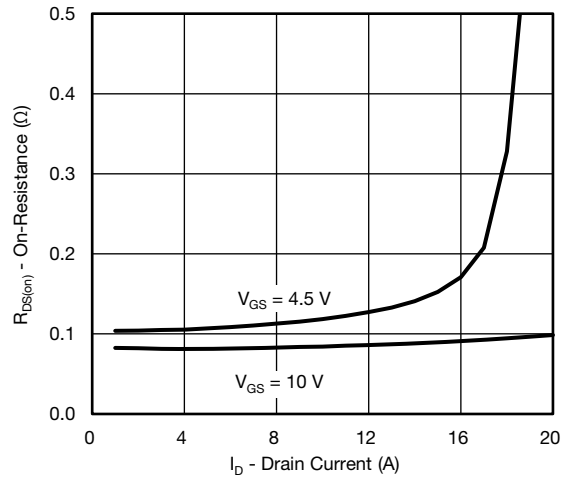
- d. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
e. Guaranteed by design, not subject to production testing.
f. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

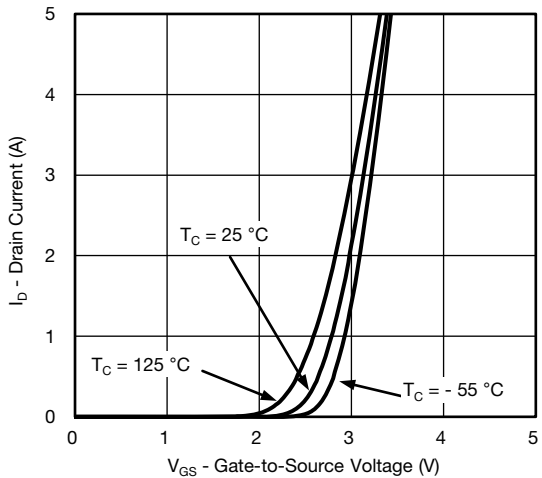
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



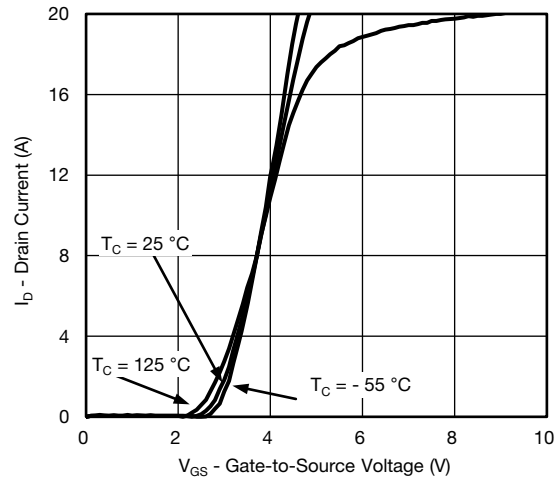
Output Characteristics



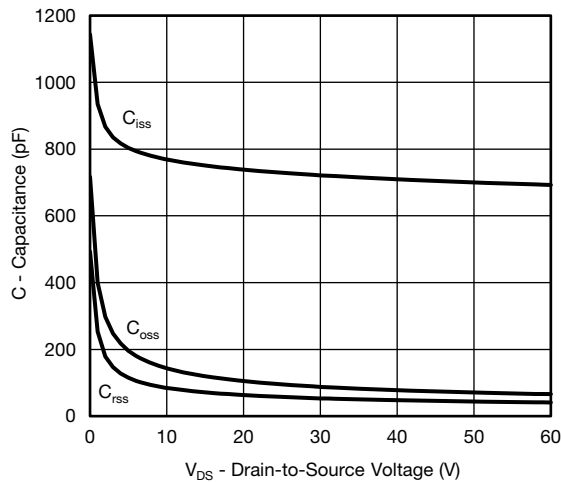
On-Resistance vs. Drain Current and Gate Voltage



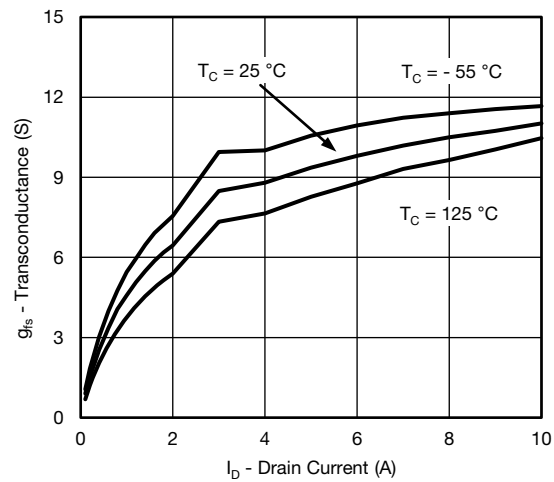
Transfer Characteristics



Transfer Characteristics



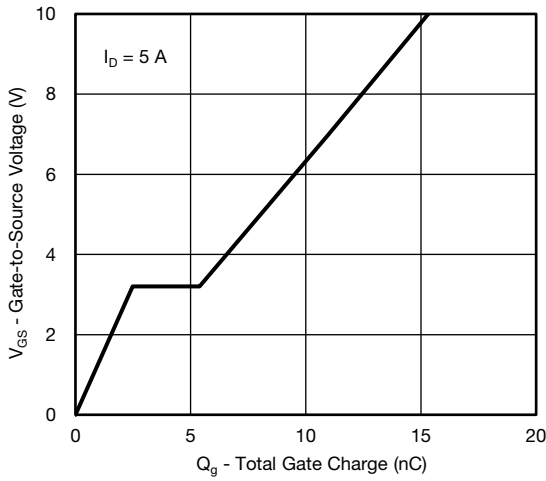
Capacitance



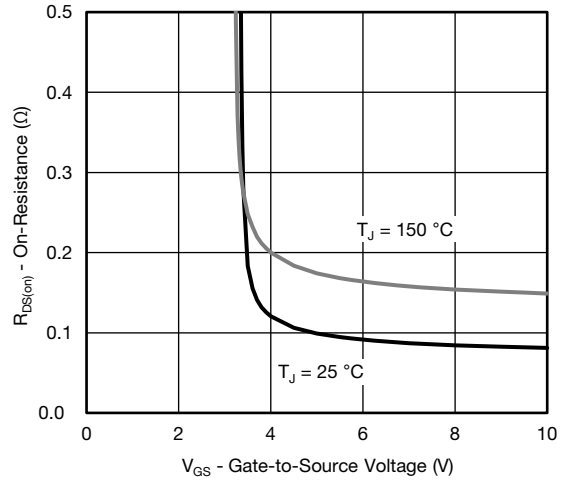
Transconductance



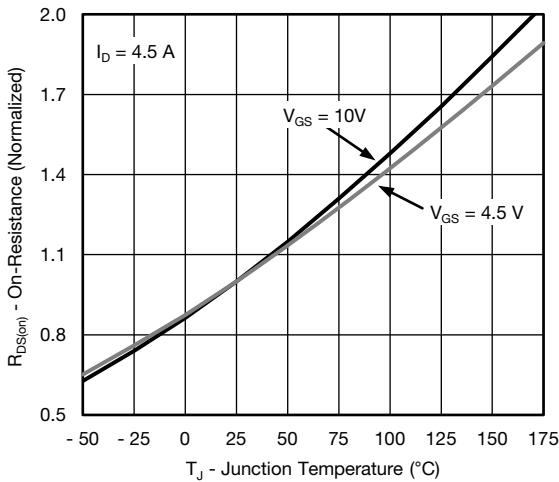
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



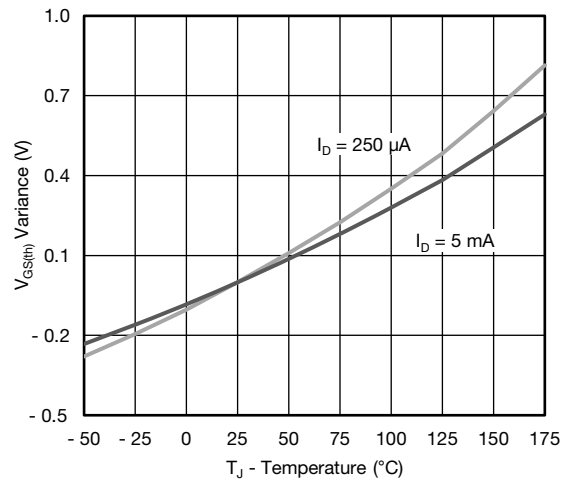
Gate Charge



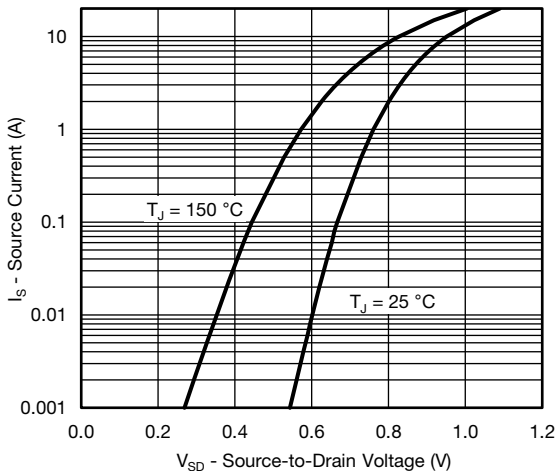
On-Resistance vs. Gate-to-Source Voltage



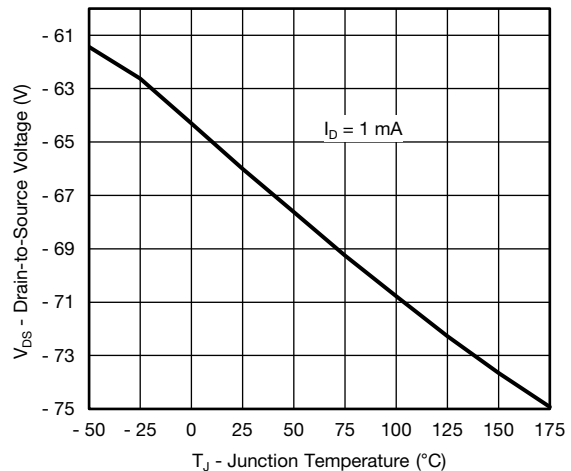
On-Resistance vs. Junction Temperature



Threshold Voltage



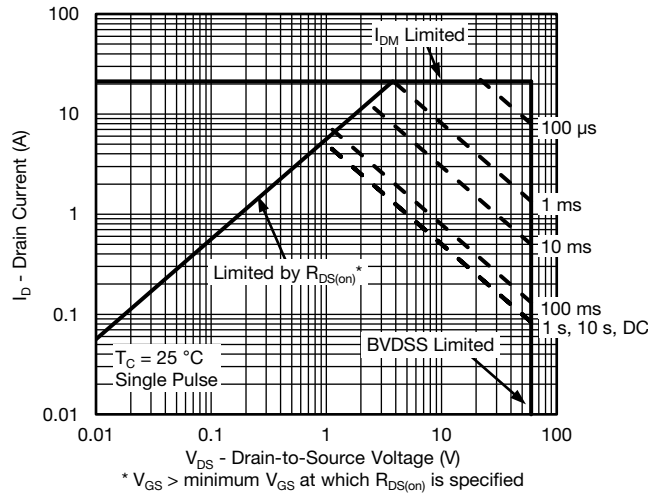
Source-Drain Diode Forward Voltage



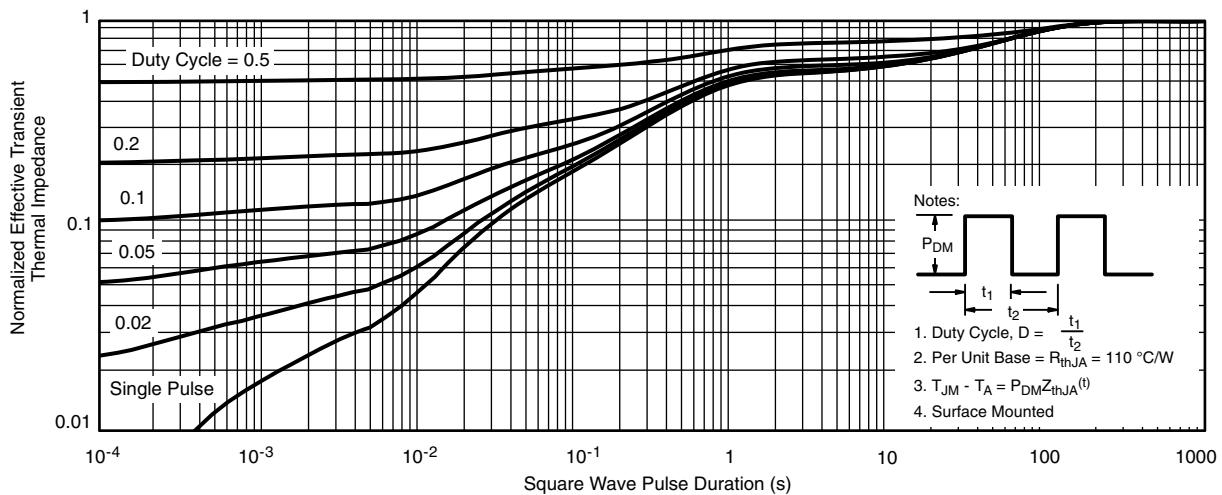
Drain-to-Source Voltage vs. Junction Temperature



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



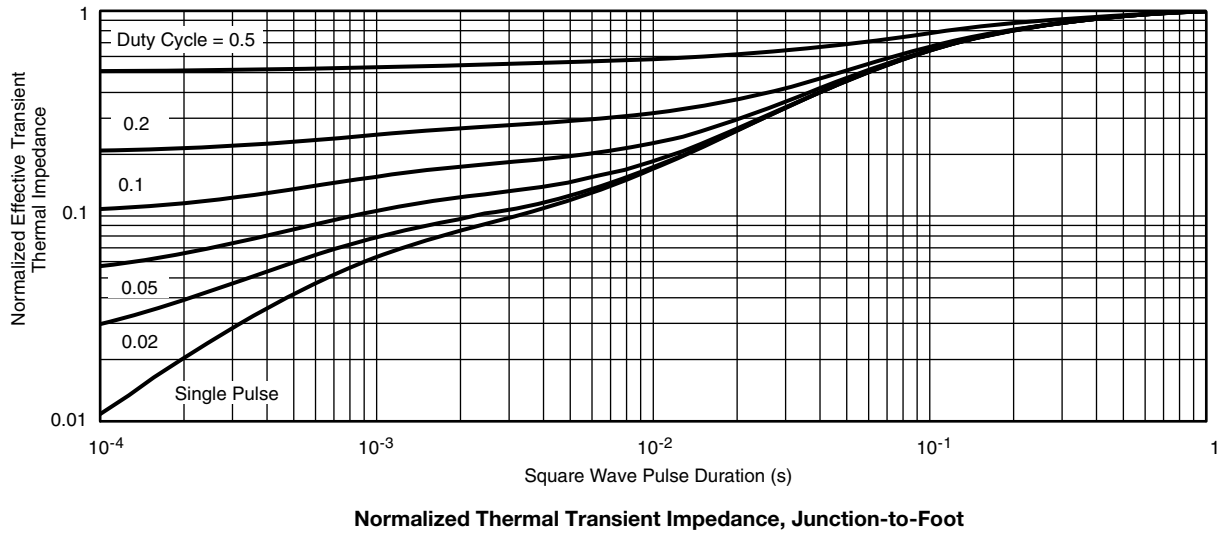
Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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TSOP: 5/6-LEAD

JEDEC Part Number: MO-193C



5-LEAD TSOP



6-LEAD TSOP



| Dim | MILLIMETERS | | | INCHES | | |
|--------------------------------|-------------|------|------|------------|-------|-------|
| | Min | Nom | Max | Min | Nom | Max |
| A | 0.91 | - | 1.10 | 0.036 | - | 0.043 |
| A₁ | 0.01 | - | 0.10 | 0.0004 | - | 0.004 |
| A₂ | 0.90 | - | 1.00 | 0.035 | 0.038 | 0.039 |
| b | 0.30 | 0.32 | 0.45 | 0.012 | 0.013 | 0.018 |
| c | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| D | 2.95 | 3.05 | 3.10 | 0.116 | 0.120 | 0.122 |
| E | 2.70 | 2.85 | 2.98 | 0.106 | 0.112 | 0.117 |
| E₁ | 1.55 | 1.65 | 1.70 | 0.061 | 0.065 | 0.067 |
| e | 0.95 BSC | | | 0.0374 BSC | | |
| e₁ | 1.80 | 1.90 | 2.00 | 0.071 | 0.075 | 0.079 |
| L | 0.32 | - | 0.50 | 0.012 | - | 0.020 |
| L₁ | 0.60 Ref | | | 0.024 Ref | | |
| L₂ | 0.25 BSC | | | 0.010 BSC | | |
| R | 0.10 | - | - | 0.004 | - | - |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |
| θ₁ | 7° Nom | | | 7° Nom | | |
| ECN: C-06593-Rev. I, 18-Dec-06 | | | | | | |
| DWG: 5540 | | | | | | |



Recommended Land Pattern For TSOP-5L / TSOP-6L



Note

- All dimensions are in inches (millimeter)

ECN: C22-0860-Rev. B, 24-Oct-2022
 DWG: 3010



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