

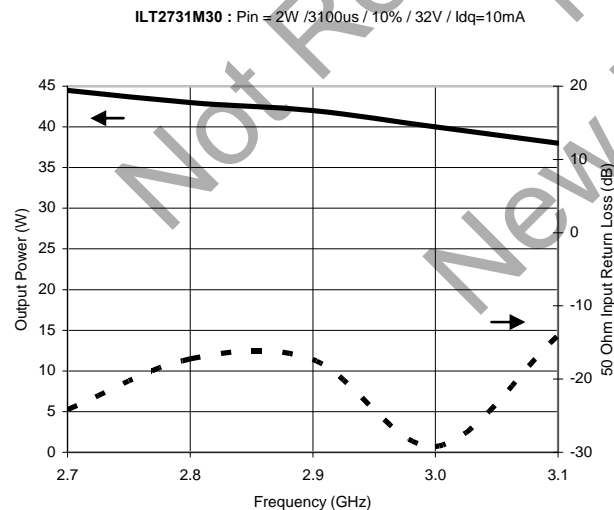
S-Band Radar 50 Ω Transistor

Part number ILT2731M30 is a high power transistor which is internally matched to 50 ohms. It is designed for S-Band radar systems and operates over the instantaneous bandwidth of 2.7-3.1 GHz. It utilizes gold metal LDMOS transistor technology operating in common source configuration. Production RF performance screening is performed at the 100% level while operating under class AB bias ($I_{DQ} = 10\text{mA}$) with a 300us pulse width at 10% duty. The device is operable under a wide range of biasing and pulsing conditions. This device is rated for a peak output power level of $P_{PEAK} = 30\text{W}$ @ 10% duty factor. This corresponds to an average power $P_{AVG} = 3\text{W}$.



Operate any power level from due to linear transfer curve

TYPICAL OUTPUT POWER VERSUS FREQUENCY PERFORMANCE



50 Ohm Matched

- Requires no external impedance matching circuitry

Silicon LDMOS Transistor

- Gold Metal

Class AB Operation

- Operable under a wide range of bias conditions

Common Source Configuration

- Chip internal Source grounding

Gold Metal System

- Complete Gold System Including Bond-wires
- Maximum Reliability

Be0 Free Package

- Metal Based
- Epoxy seal

RF High Power Test

- 100% Device RF High Power Screening

MAXIMUM RATINGS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------|--|-----------|------|------|-------|-----------------------------|
| BD | Drain-Source Voltage | V_{DS} | -- | 65 | V | -- |
| BD | Gate-Source Voltage | V_{GS} | -0.5 | 12 | V | -- |
| BD | Storage Temperature Range | T_{STG} | -55 | +150 | °C | -- |
| BD | Operating Junction Temperature Range | T_J | -55 | +200 | °C | -- |
| BD | CW Operation | -- | -- | -- | -- | Not rated for CW operation. |
| Note | Screen 'BD' = parameter qualified By Design. | | | | | |

THERMAL CHARACTERISTICS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------|--|--------------|-----|------|-------|---|
| BD | Thermal Resistance | $R_{TH(JC)}$ | -- | 0.38 | °C/W | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F3.$ |
| Note | Screen 'BD' = parameter qualified By Design. | | | | | |

PROCESSING SPECIFICATIONS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------|--|--------|-----|-----|-------|---|
| 100% | DC Wafer Probe | -- | -- | -- | -- | Per Integra specification. |
| Q1 | Wafer DC and RF Qualification | -- | -- | -- | -- | Per Integra specification. |
| LM | Wire Bond Strength | -- | -- | -- | -- | Line monitor per Integra specification. |
| 100% | Pre-cap visual inspection | -- | -- | -- | -- | Per Integra specification |
| 100% | Gross leak test | -- | -- | -- | -- | MIL-STD-750D, Method 1071, Test Condition C |
| Note | Screen 'Q1' = parameter is qualified by assembly and test of 3 pieces minimum per wafer. | | | | | |
| Note | Screen 'LM' = parameter is qualified by assembly line monitor. | | | | | |

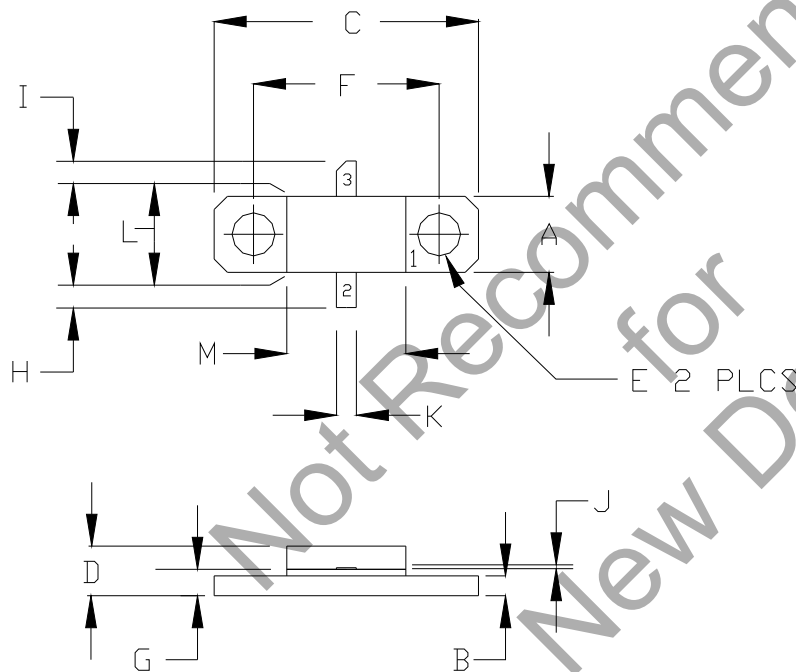
DC ELECTRICAL CHARACTERISTICS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------|--------------------------------|------------|-----|-----|---------|---|
| 100% | Drain-Source Breakdown Voltage | BV_{DSS} | 65 | -- | V | $I_{DS} = 10mA, V_{GS} = 0V, T_F = 25\pm5^\circ C.$ |
| 100% | Drain Leakage Current | I_{DSS} | -- | 2.0 | μA | $V_{DS} = 32V, V_{GS} = 0V, T_F = 25\pm5^\circ C.$ |
| 100% | Operating Gate Voltage | V_{GS} | 1.5 | 4.0 | V | $V_{DS} = 5V, I_D = 0.1A, T_F = 25\pm5^\circ C.$ |
| BD | Gate Leakage Current | I_{GSS} | -- | 2.0 | μA | $V_{GS} = 10V, V_{DS} = 0V, T_F = 25\pm5^\circ C.$ |

RF ELECTRICAL CHARACTERISTICS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------|---|--------|-------|-------|-------|---|
| 100% | Input Return Loss | IRL | -18 | -10 | dB | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}=P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ |
| 100% | Power Gain | G_P | 11.0 | 15.0 | dB | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}=P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ |
| 100% | Power Gain Flatness versus Frequency | GF | 0.0 | 1.3 | dB | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}=P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ |
| 100% | Drain Current - Peak | I_D | 1.00 | 4.00 | A | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}=P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ |
| 100% | Pulse Amplitude Droop | D | -0.50 | +0.20 | dB | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}=P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ |
| 100% | Stability into 3:1 VSWR | VSWR-S | -- | -- | -- | $V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1,$ $P_{IN}=P_{IN1}, P_{IN2}, P_{IN3}, F=F1, F2, F3.$ Rotate 3:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse. All non-harmonically related signals must be at least -65 dBc. |
| Note 1 | $V1 = 32V; I_{DQ1} = 10mA; PW1 = 300\mu s; DF1 = 10\%$ | | | | | |
| Note 2 | Input Power Test Levels: $P_{IN0} = P_{IN1} = P_{IN2} = P_{IN3} = 2.0W$ | | | | | |
| Note 3 | Test Frequencies: $F1 = 2.7 GHz, F2 = 2.9 GHz, F3 = 3.1 GHz$ | | | | | |
| Note 4 | $T_F = 25\pm 5^\circ C =$ Device Flange Temperature | | | | | |

PACKAGE DIMENSIONAL OUTLINE DRAWING

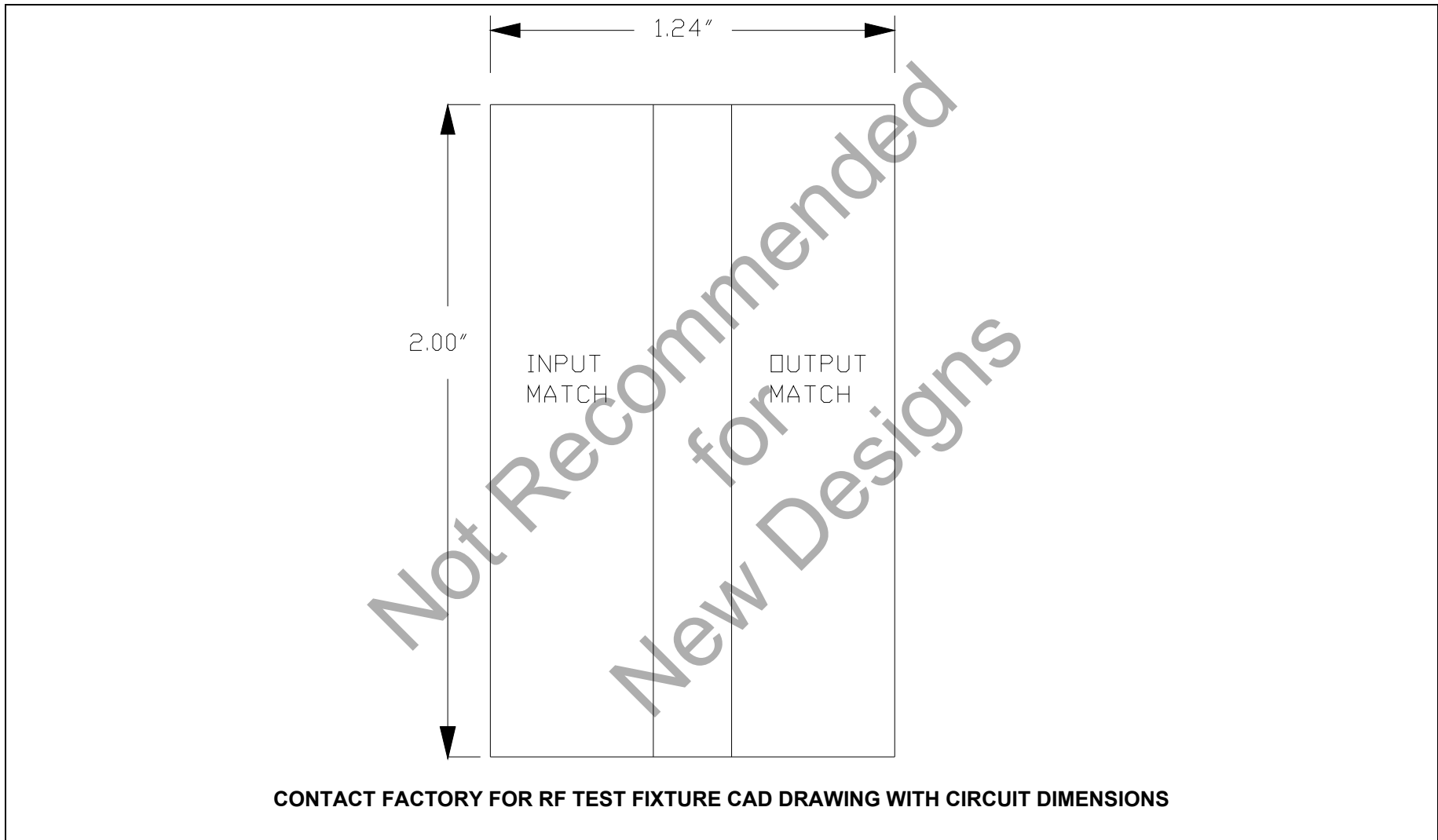


| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.225 | 0.235 | 5.71 | 5.96 |
| B | 0.055 | 0.065 | 1.40 | 1.65 |
| C | 0.795 | 0.805 | 20.19 | 20.44 |
| D | 0.140 | 0.160 | 3.55 | 4.06 |
| E | 0.125 | 0.135 | 3.18 | 3.43 |
| F | 0.557 | 0.567 | 14.14 | 14.40 |
| G | 0.077 | 0.087 | 1.95 | 2.20 |
| H | 0.093 | 0.107 | 2.36 | 2.72 |
| I | 0.093 | 0.107 | 2.36 | 2.72 |
| J | 0.004 | 0.006 | 0.10 | 0.15 |
| K | 0.055 | 0.065 | 1.40 | 1.65 |
| L | 0.225 | 0.235 | 5.71 | 5.96 |
| M | 0.355 | 0.365 | 9.01 | 9.27 |

| PIN SCHEDULE | |
|--------------|--------|
| 1 | SOURCE |
| 2 | GATE |
| 3 | DRAIN |

NOTES:
LID: SEE BOM

RF TEST FIXTURE



DEFINITIONS

| Data Sheet Status | |
|---|---|
| Proposed Specification | This data sheet contains proposed specifications. |
| Preliminary Specification | This data sheet contains specifications based on preliminary measurements and data. |
| Product Specification | This data sheet contains final product specifications. |
| Maximum Ratings | |
| Stress above one or more of the maximum ratings may cause permanent damage to the device. These are maximum ratings only. Operation of the device at these or at any other conditions above those given in the characteristics sections of the specification is not implied. Exposure to maximum values for extended periods of time may affect device reliability. | |

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Not Recommended for New Designs