# Part Number: ILD0912M60

Integra
TECHNOLOGIES, INC.

## 60W AVIONICS LDMOS

The high power transistor part number ILD0912M60 is designed for the frequency band 960-1215 MHz. Operating at 10us/10% pulse conditions this LDMOS FET device supplies a minimum of 60 watts of power across the instantaneous operating bandwidth of 960-1215 MHz. All devices are 100% screened for large signal RF parameters.


**Silicon LDMOS FET**
- High Power Gain
- Superior thermal stability

**Class AB Operation**
- Gate biased to $I_{DQ}$ = 550 mA

**Configuration**
- Common Source

**Gold Metal**
- Maximum Reliability

**Package**
- Thermally enhanced
- Pb-free and RoHS-compliant

**Epoxy Sealed Lid**
- Gross Leak Qualified

**RF Test Fixture**
- Broadband
- Matched to 50Ω
- Long-term Correlation
- 100% Device RF Screening
- No External Tuning required

*TYPICAL DATA TYPICAL DATA TYPICAL DATA TYPICAL DATA*

| Freq (MHz) | $P_{IN}$ (W) | RL (dB) | Pout (W) | Gp (dB) | Gf (dB) | Id (A) | nd (%) | Droop (dB) | VSWR - LMT 3:1 (P-F) |
|---|---|---|---|---|---|---|---|---|---|
| 960 | 1.4 | -18.0 | 60 | 16.41 | | 8.600 | 64.5 | 0.14 | P |
| 1090 | 1.4 | -17.0 | 60 | 16.48 | 0.85 | 8.610 | 64.3 | 0.07 | P |
| 1215 | 1.6 | -18.0 | 60 | 15.63 | | 8.700 | 62.5 | 0.03 | P |





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## MAXIMUM RATINGS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| BD | Drain-Source Voltage | $V_{DSS}$ | -- | 65 | V | -- |
| BD | Gate-Source Voltage | $V_{GS}$ | -0.5 | 12 | V | -- |
| BD | Storage Temperature Range | $T_{STG}$ | -40 | +150 | °C | -- |
| BD | Operating Junction Temperature Range | $T_J$ | -55 | +200 | °C | -- |
| | | | | | | |
| Note | Screen 'BD' = parameter qualified By Design. | | | | | |

## THERMAL CHARACTERISTICS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| BD | Thermal Resistance | $R_{TH(JC)}$ | -- | 0.17 | °C/W | $V_{DS}$=30V, $I_{DQ}$=550mA, $T_F$=25±5°C, $P_{OUT}$=60W, 10us/10%. |
| | | | | | | |
| 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 | $I_D$ = 10mA, $V_{GS}$ = 0V, $T_F$ = 25±5°C |
| 100% | Drain Leakage Current | $I_{DSS}$ | -- | 2 | µA | $V_{DS}$ = 30V, $V_{GS}$ = 0V, $T_F$ = 25±5°C |
| 100% | Gate Threshold Voltage | $V_{GSTH}$ | 1.5 | 5.25 | V | $I_{DQ}$ = 100mA, $V_{DS}$ = 5V, $T_F$ = 25±5°C |
| 100% | Gate Leakage Current | $I_{GSS}$ | -- | 1 | µA | $V_{GS}$ = 5V, $V_{DS}$ = 0V, $T_F$ = 25±5°C |





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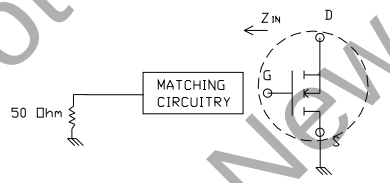
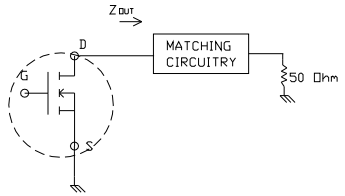
## RF ELECTRICAL CHARACTERISTICS

| Screen | Parameter | Symbol | Min | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| 100% | Input Return Loss | RL | -18 | -10 | dB | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3. |
| 100% | Input Power | Pin | 0.95 | 1.69 | W | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3. |
| 100% | Power Gain | $G_p$ | 15.5 | 18 | dB | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3. |
| 100% | Drain Efficiency | $N_d$ | 42 | 100 | % | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3. |
| 100% | Load Mismatch Tolerance | VSWR-LMT | 3:1 | -- | -- | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3, Rotate 3:1 output VSWR through 360°phase. Survival. |
| 100% | Gain Flatness | GF | -- | 2.5 dB | dB | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3. |
| 100% | Signal Amplitude Droop | Droop | -0.5 | 0.5 | dB | $V_d$=30V, $P_{OUT}$ = 60W, 10us, 10%, Idq=550mA, $T_F$=25±5°C, F=F1, F2, F3. |
| Note 1 | F1= 960 MHz, F2= 1090 MHz, F3= 1215 MHz. | | | | | |
| Note 2 | $T_F$ = Device flange temperature. | | | | | |
| Note 3 | Screen 'BD' = parameter qualified By Design. | | | | | |

## RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

| Frequency (MHz) | $Z_{IF}$ (Ω) | $Z_{OF}$ (Ω) |
|---|---|---|
| 960 | 2.40 – j0.60 | 3.67 – j2.42 |
| 1090 | 2.75 - j0.29 | 3.92 – j1.57 |
| 1215 | 2.83 – j0.32 | 4.03 – j1.20 |
| |  |  |









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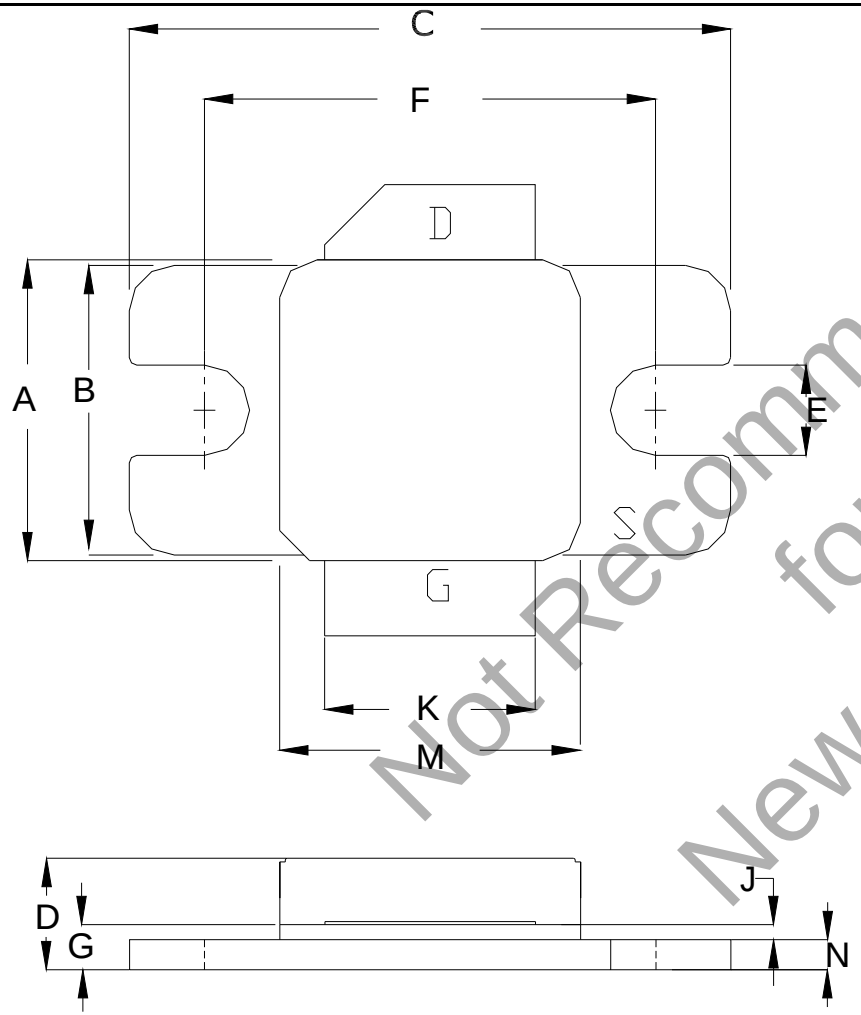
## PACKAGE DIMENSIONAL OUTLINE DRAWING




| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.395 | 0.405 | 10.03 | 10.29 |
| B | 0.380 | 0.390 | 9.65 | 9.91 |
| C | 0.795 | 0.805 | 20.19 | 20.45 |
| D | 0.128 | 0.156 | 3.25 | 3.96 |
| E | 0.115 | 0.125 | 2.92 | 3.17 |
| F | 0.595 | 0.605 | 15.11 | 15.37 |
| G | 0.057 | 0.067 | 1.45 | 1.70 |
| H | 0.080 | 0.120 | 2.03 | 3.04 |
| I | 0.080 | 0.120 | 2.03 | 3.04 |
| J | 0.015 | 0.025 | 0.38 | 0.63 |
| K | 0.275 | 0.285 | 6.98 | 7.24 |
| M | 0.395 | 0.405 | 10.03 | 10.29 |
| N | 0.035 | 0.045 | 0.89 | 1.14 |

| PIN SCHEDULE | |
|---|---|
| D | DRAIN |
| S | SOURCE |
| G | GATE |





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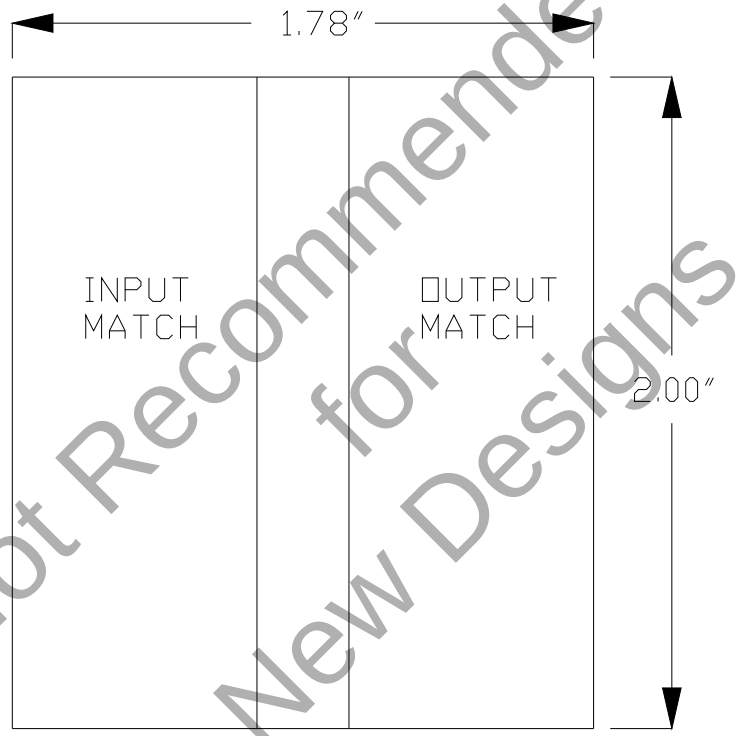
**RF TEST FIXTURE**






**CONTACT FACTORY FOR RF TEST FIXTURE CAD DRAWING WITH CIRCUIT DIMENSIONS**



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## 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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