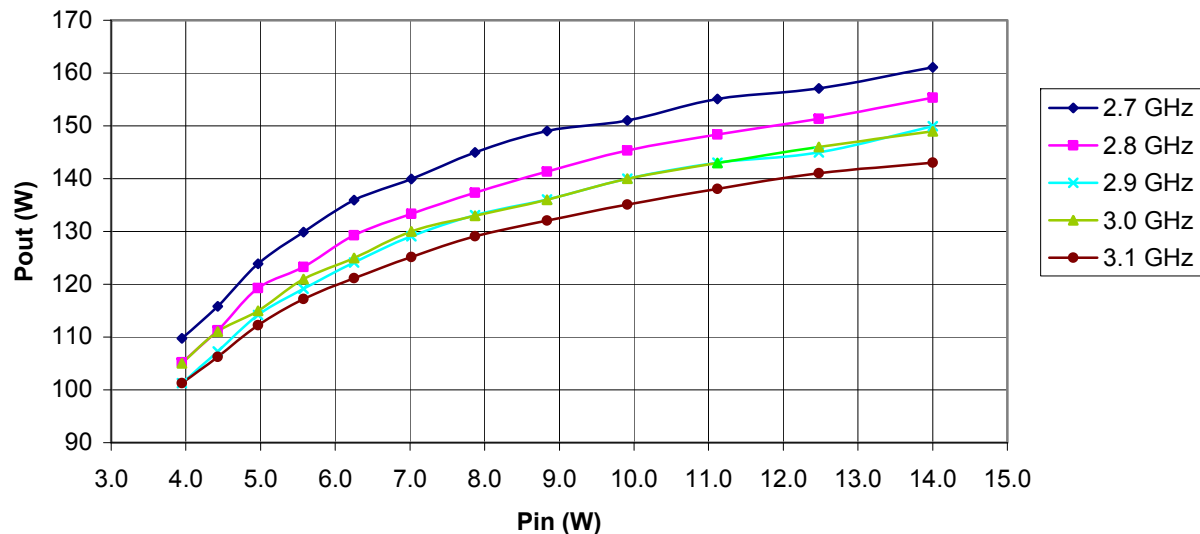


## S-Band Radar 50 Ω Transistor

Part number ILT2731M130 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. It may be operated in class B, AB and A mode. It is operable over nearly any pulse width and duty factor. Under 300us / 10% pulsed operation it can be used to supply a minimum of 130 watts of peak pulse power over the instantaneous frequency range of 2.7-3.1 GHz. All devices are 100% screened for large signal RF parameters. This device is rated for a peak output power level of  $P_{PEAK} = 130W @ 10\%$  duty factor. This corresponds to an average power  $P_{AVG} = 13W$ .



Input Power versus Output Power



### 50 Ohm Matched

- Requires no external impedance matching circuitry

### Silicon LDMOS Transistor

- Gold Metal
- Excellent thermal stability

### Class AB Operation

- Internal 1K Gate to ground resistor for ease of biasing

### Common Source Configuration

- Linear Transfer Characteristic

### Gold Metal System

- Complete Gold System
- LDMOS with Gold Metal
- Gold Bond Wires
- Gold Package Metal
- Maximum Reliability

### BeO Package

- Epoxy seal

### RF High Power Test

- 100% Device RF High Power Screening in 50Ω Fixture
- No Circuit Tuning Required
- Long-term Correlation Maintained

**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	$R_{TH(JC)}$	--	0.19	°C/W	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1.$
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.					

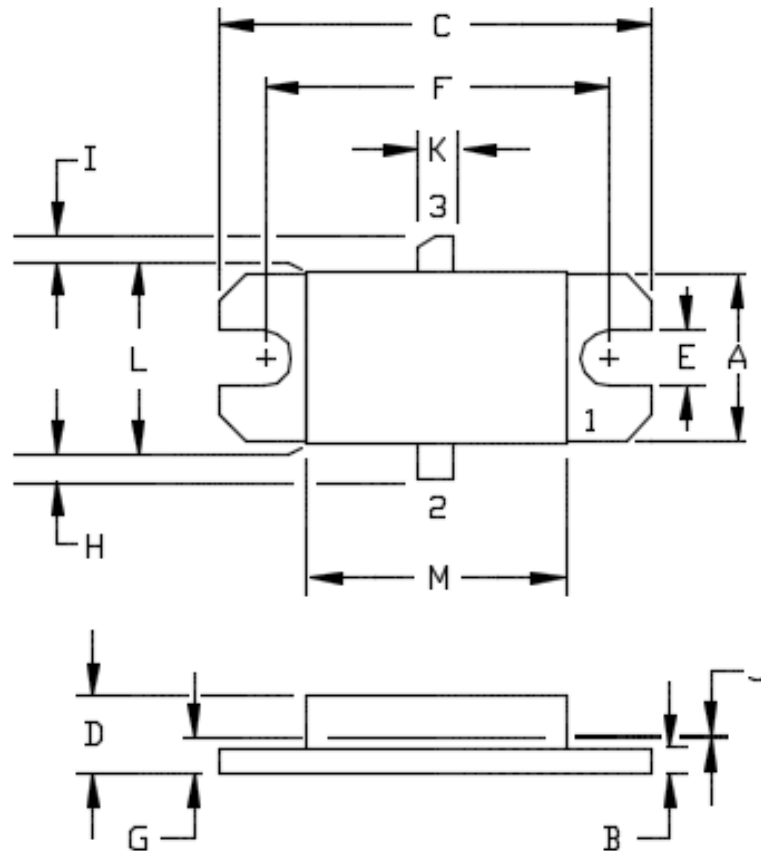
**DC ELECTRICAL CHARACTERISTICS**

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	$I_{DSS}$	--	1.0	$\mu A$	$V_{DS} = 32V, V_{GS} = 0V, T_F = 25\pm5^\circ C.$
100%	Operating Gate Voltage	$V_{GS}$	2.5	4.0	V	$V_{DS} = 5V, I_D = 0.1A, T_F = 25\pm5^\circ C.$
BD	Gate Leakage Current	$I_{GSS}$	--	1.0	$\mu A$	$V_{GS} = 10V, V_{DS} = 0V, T_F = 25\pm5^\circ C.$

**RF ELECTRICAL CHARACTERISTICS**

Screen	Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
100%	Input Return Loss	IRL1	-18	-10	-7	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1.$
100%	Input Return Loss	IRL2	-18	-12	-7	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F2.$
100%	Input Return Loss	IRL3	-18	-16	-7	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F3.$
100%	Output Power	P <sub>out</sub>	130	150	190	W	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Power Gain	G <sub>P</sub>	11.14	11.76	12.79	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Output Power Flatness vs Frequency	OPF	0.0	0.3	1.0	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Drain Efficiency	N <sub>D</sub>	40	43	60	%	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Drain Current - Peak	I <sub>D</sub>	8.0	11.0	14.0	A	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Pulse Amplitude Droop	D	-0.50	-0.30	+0.20	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Stability into 3:1 VSWR	VSWR-S		--	--	--	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=TF1, P_{IN}=P_{IN1}, F=F1, F2, F3.$ 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 <sub>DQ1</sub> = 50mA; PW1 = 300μs; DF1 = 10%						
Note 2	P <sub>IN1</sub> = 10W						
Note 3	Test Frequencies: F1 = 2.70 GHz, F2 = 2.90 GHz, F3 = 3.10 GHz						
Note 4	T <sub>F</sub> = 25±5°C = Device Flange Temperature						

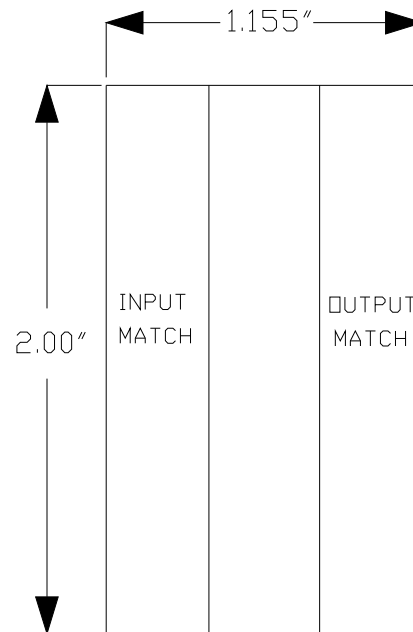
**PACKAGE DIMENSIONAL OUTLINE DRAWING**



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.380	0.390	9.65	9.91
B	0.055	0.065	1.40	1.65
C	0.905	1.005	22.99	25.53
D	0.178	0.188	4.52	4.78
E	0.125	0.135	3.18	3.43
F	0.795	0.805	20.19	20.45
G	0.082	0.092	2.08	2.34
H	0.095	0.105	2.41	2.67
I	0.095	0.105	2.41	2.67
J	0.002	0.004	0.05	0.10
K	0.095	0.105	2.41	2.67
L	0.395	0.405	10.03	10.29
M	0.595	0.605	15.11	15.37

PIN SCHEDULE	
1	BASE
2	EMITTER
3	COLLECTOR

**RF TEST FIXTURE**



CONTACT FACTORY FOR RF TEST FIXTURE CAD DRAWING WITH CIRCUIT DIMENSIONS

ASSEMBLY AND PARTS LIST

**DEFINITIONS**

<b>Data Sheet Status</b>	
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.
<b>Maximum Ratings</b>	
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.	

**WARNING**

<b>Product and environmental safety - toxic materials</b>
This product contains beryllium oxide. The product is entirely safe provided that the BeO base is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with general or domestic waste.

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