

1011LD110B

110 Watts, 32 Volts

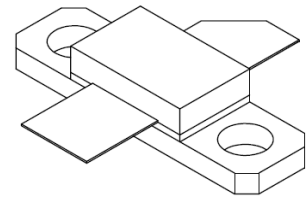
Pulsed Avionics 1030 to 1090 MHz

LDMOS FET

GENERAL DESCRIPTION

The 1011LD110B is a COMMON SOURCE N-Channel enhancement mode lateral MOSFET capable of providing 110W_{pk} of RF power from 1030MHz to 1090 MHz. The device is nitride passivated and utilizes gold metallization to ensure highest MTTF. The transistor includes input and output prematch for broadband capability. Low thermal resistance package reduces junction temperature, extends life. Integrated ESD protection makes the device robust.

CASE OUTLINE
55QT
 (Common Source)



ABSOLUTE MAXIMUM RATINGS

Voltage and Current

Drain-Source (V_{DSS}) +65V
 Gate-Source ($V_{GS}, V_{DS}=0$) +20V

Temperatures

Storage Temperature -65 to +150°C
 Operating Case Temperature¹ +100°C

ELECTRICAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV_{DSS}	Drain-Source Breakdown	$V_{GS} = 0V, I_D = 2mA$	65			V
I_{DSSF}	Drain-Source Leakage Current	$V_{DS} = 32V, V_{GS} = 0V$			5	μA
I_{GSSF}	Gate-Source Leakage Current	$V_{GS} = 10V, V_{DS} = 0V$			2	μA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = 10V, I_D = 3mA$	2		4	V
$V_{DS(ON)}$	Drain-Source On Voltage	$V_{GS} = 10V, I_D = 1A$			0.25	V
g_{FS}	Forward Transconductance	$V_{DS} = 10V, I_D = 1A$		2.2		S
θ_{JC}^1	Thermal Resistance				0.12	°C/W

FUNCTIONAL CHARACTERISTICS @ 25°C, $V_{ds} = 32V, I_{DQ} = 250mA$

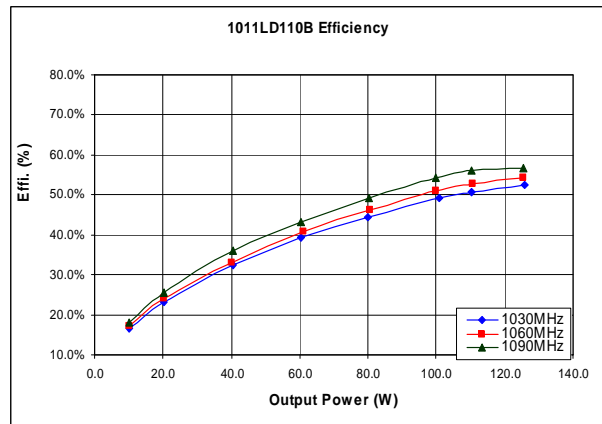
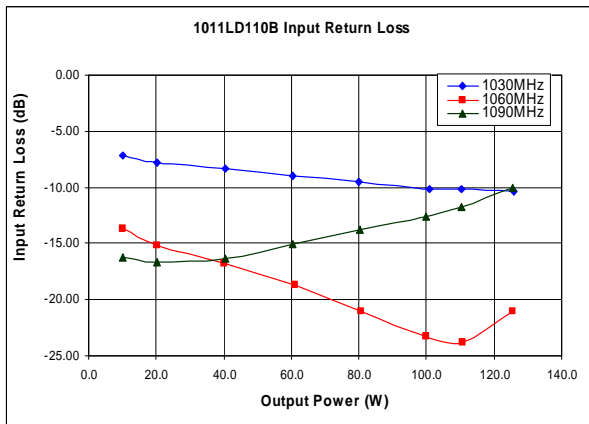
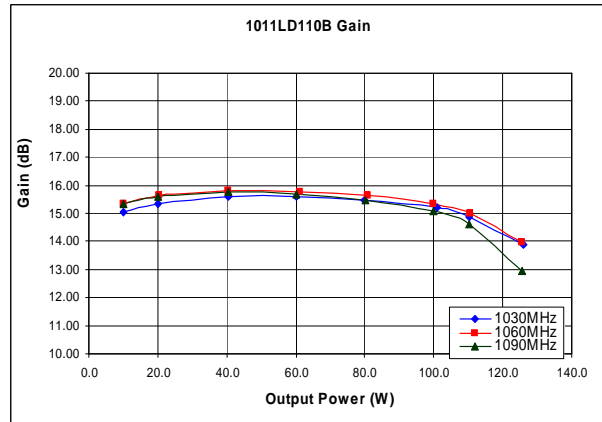
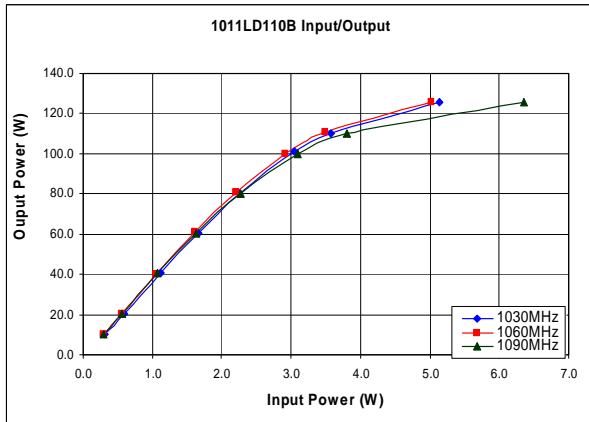
G_{PS}	Common Source Power Gain	Pulse width = 32 μs , LTDC=2%, F=1030/1090 MHz, $P_{out} = 110W$	13.5	14.5		dB
P_d	Pulse Droop				0.5	dB
P_{1dB}	Output Power at 1dB Gain Compression	Pulse width = 32 μs , LTDC=2%, F=1030/1090 MHz		110		W
η_D	Drain Efficiency	F = 1030 MHz, $P_{out} = 110W$	45	50		%
ψ	Load Mismatch	F = 1090 MHz, $P_{out} = 110W$			5:1	

NOTES: 1. At rated output power and pulse conditions
 2. Pulse Format 1: 32 μs , 2% Long Term Duty Factor
 3. Pulsed Bias: $I_{DQ-PULSED} = 6.5mA$ (@ 42 μs ON, 1.6msec)

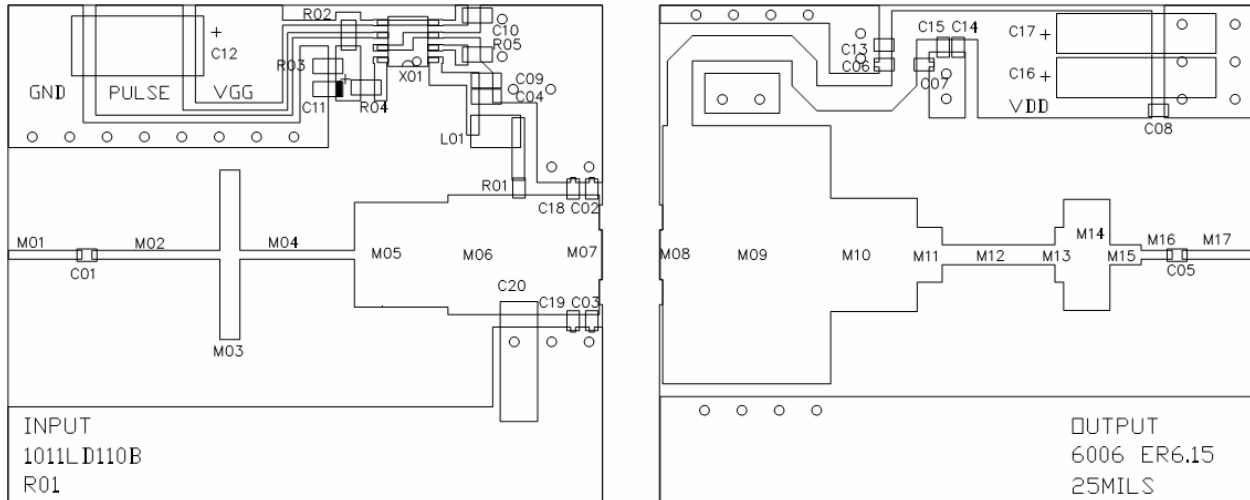
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Typical Performance (1030MHz ~ 1090MHz)

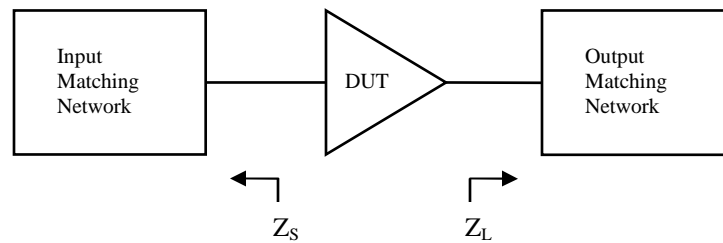


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1011LD110B Test Circuit Layout

1011LD110B Test Circuit Component Designations and Values

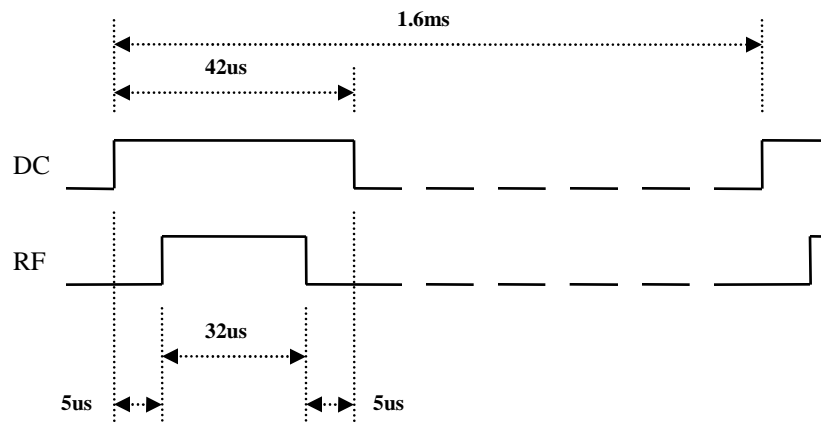
Part	Description	Part	Description
C01, C04, C05, C06	43pF Chip Capacitor (ATC 100A)	C10, C14, C15	0.033uF Chip Capacitor
C07, C08	100pF Chip Capacitor (ATC 100A)	C11	1uF 16V Tantalum Capacitor
C02, C03	7.5pF Chip Capacitor (ATC 100A)	C12	47uF 63V Electrolytic Capacitor
C18, C19	4.7pF Chip Capacitor (ATC 100A)	C16	470uF, 63V Electrolytic Capacitor
C20	.35-3.5pF Johanson Capacitor, JMC5801	C17	1000uF, 63V Electrolytic Capacitor
C09, C13	1000pF Chip Capacitor	L01	6 Turns, 24 AWG, IDIA 0.092"
X01	ADG419, Analog Device	R01, R04	15Ω, 1/4W Chip Resistor
R02, R03	200Ω, 1/4W Chip Resistor	R05	82.5Ω, 1/4W Chip Resistor
M01	36 x 295 mils (W x L)	M02	36 x 513 mils (W x L)
M03	680 x 80 mils (W x L)	M04	36 x 460 mils (W x L)
M05	420 x 375 mils (W x L)	M06	480 x 608 mils (W x L)
M07	200 x 10 mils (W x L)	M08	200 x 10 mils (W x L)
M09	1034 x 674 mils (W x L)	M10	454 x 348 mils (W x L)
M11	220 x 100 mils (W x L)	M12	80 x 452 mils (W x L)
M13	220 x 35 mils (W x L)	M14	445 x 186 mils (W x L)
M15	80 x 125 mils (W x L)	M16	36 x 125 mils (W x L)
M17	36 x 286 mils (W x L)	PCB	Rogers RT6006, ε _r =6.15, 25mils, 1oz

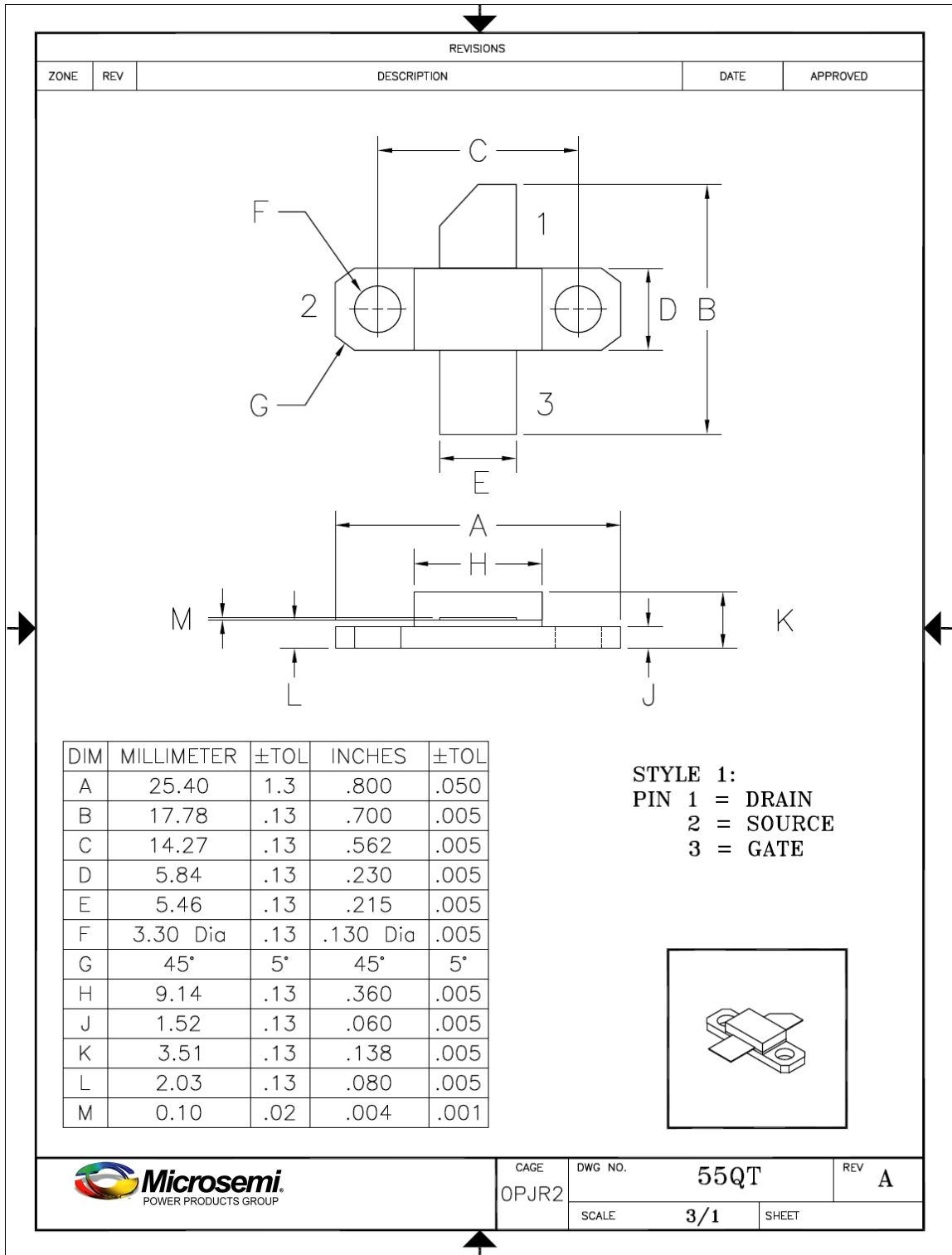
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Typical Impedance Values


Frequency (MHz)	Z_S (Ω)	Z_L (Ω)
1030	0.88 - j1.21	1.95 - j1.59
1060	0.80 - j1.05	1.68 - j1.50
1090	0.73 - j0.88	1.43 - j1.34

* $V_{DS} = 32V$, $I_{DQ} = 250mA$, $P_{out} = 110W$
 * Pulse Format: 32 μs , 2% Long Term Duty Factor

Timing Diagram for Pulsed Bias




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