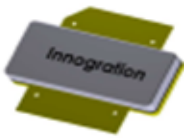
MC011K5UXS LDMOS TRANSISTORs

Document Number: MC011K5UXS
Preliminary Datasheet V1.1

1200/1500W, 50V/60V RF Single ended LDMOS

MC011K5UXS



Description

The MC011K5UXS itself is a 1200watt capable, high performance, high ruggedness，unmatched single ended earless LDMOS up to 150MHz**. It can simplify the circuit without the use of sizable balun or transformer within very narrow band or at fixed single frequency.**

- Typical **high power** tuning performance at 13.56MHz with single MC011K5UXS
  V_{DS}=50V,I_{DQ}=100mA,CW

Vds	Pin(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
50	41.6	**1450**	38.2	20	76

Load mismatch/Ruggedness test, result : **passed**

Freq(MHz)	Signal	VSWR	Pout (W)	Voltage(V)
13.56	CW	**80:1 at all phase**	1400	48

- Typical **high eff** tuning performance at 13.56MHz with single MC011K5UXS
  V_{DS}=50V,I_{DQ}=100mA,CW

Vds	Pin(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
50	43.8	**1220**	28.8	17	84

Load mismatch/Ruggedness test, result : **passed**

Freq(MHz)	Signal	VSWR	Pout (W)	Voltage(V)
13.56	CW	**80:1 at all phase**	1200	48

- Typical performance at 27.12MHz with single MC011K5UXS
  V_{DS}=50V,I_{DQ}=100mA,CW

Vds	Pin(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
50	36	**1300**	31.4	25.2	83

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI drift
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Pb-free, RoHS-compliant

Suitable Applications

- 30-88MHz (Ground communication)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 136-174MHz (Commercial ground communication)
- Laser Exciter
- Synchrotron
- MRI
- Plasma generator
- Weather Radar

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+165	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+60	Vdc
Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Transient thermal impedance from junction to case Tj = 85° C; tp = 100 us; Duty cycle = 10 %	Zth	0.026	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics (T_A = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics (per half section)					
Drain-Source Voltage V_{GS}=0, I_{DS}=1.0mA	$V_{(BR)DSS}$		165		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 75V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Zero Gate Voltage Drain Leakage Current (V_{DS} = 50 V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Gate--Source Leakage Current (V_{GS} = 10 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 50V, I_D = 600 μA)	$V_{GS(th)}$	——	2.0	——	V
Gate Quiescent Voltage (V_{DD} = 50 V, I_D = 500 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.1	——	V

13.56MHz/High power tuning

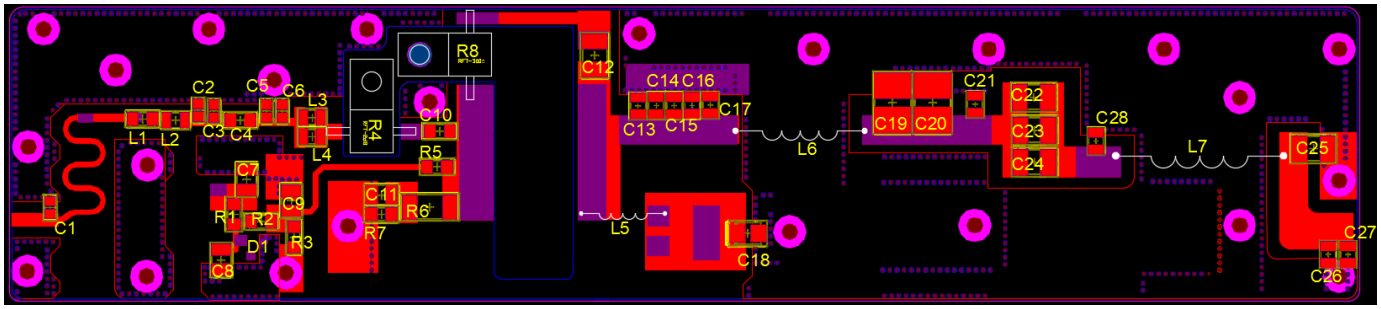


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggested Manufacturer
C1	200pF MQ300805	
C2,C3,C5,C6	82pF MQ300805	
C4,C10	10nF 0805	
C7	100pF MQ301111	

Component	Description	Suggested Manufacturer
C8,C9,C11,C18	10uF 1210	
C12	270pF MQ301111	
C13	820pF MQ101111	
C14	300pF MQ101111	
C15	390pF MQ101111	
C16,C25,C27	100pF MQ101111	
C17	910pF MQ101111	
C19	820pF MQ102525	
C20	750pF MQ102525	
C21	150pF MQ101111	
C22,C23,C24	10nF 1812	
C26	47pF MQ101111	
C28	75pF MQ101111	
R1,R2	10KΩ 1206	/
R3	6.8KΩ 1206	/
R4	2dB	TYT
R5	RFT-300Ω	TYT
L1	560nH/1008	/
L2	220nH/1008	/
L3,L4	680nH/1008	/
L5	Wire diameter 2mm,inner diameter 8mm 6turns	DIY
L6	Copper strip,2mm wide,inner diameter 10mm 3turns	DIY
L47	Copper strip,2mm wide,inner diameter 8mm 6turns	DIY
D1	LM4040BIM3-10.0/NOPB	/

13.56MHz/High Eff tuning

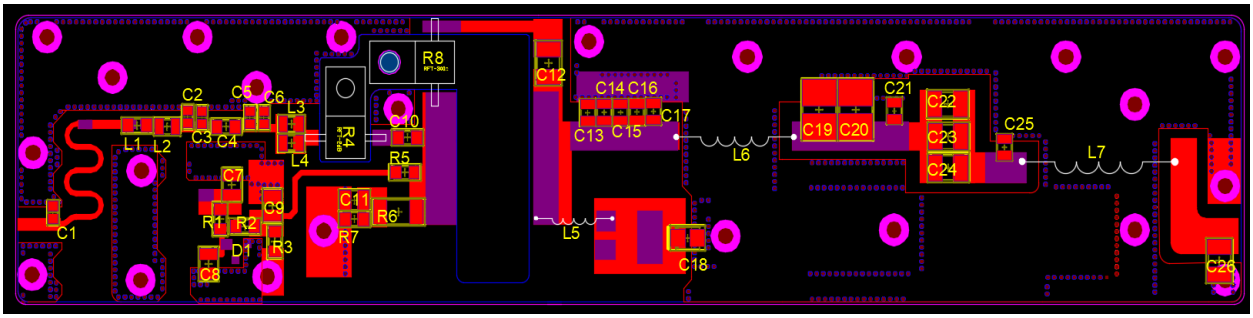


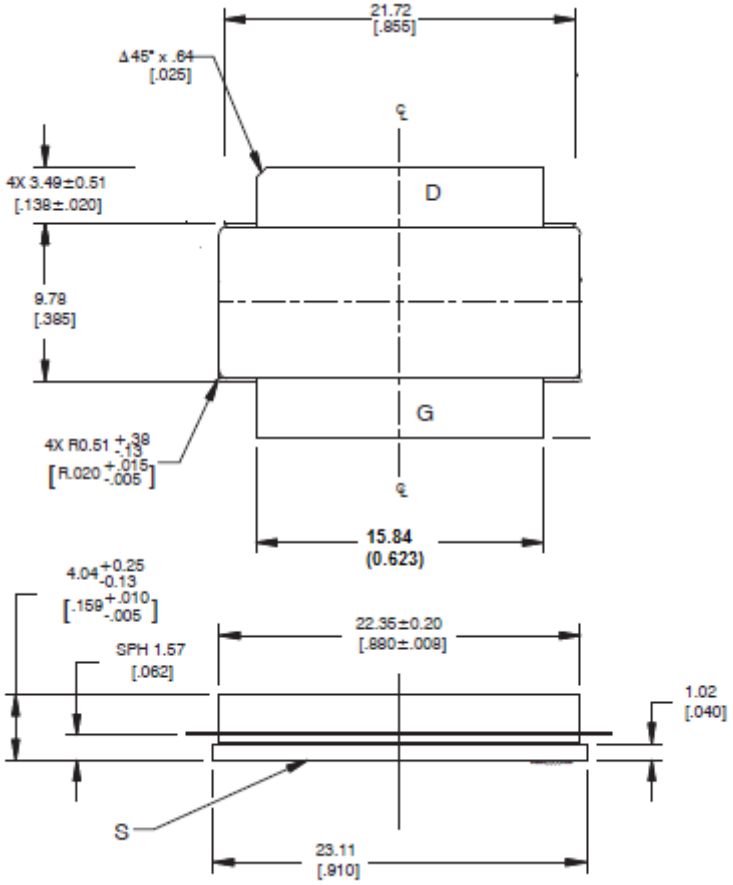
Table 6. Test Circuit Component Designations and Values

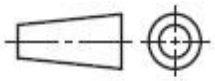
Component	Description	Suggested Manufacturer
C1	200pF MQ300805	
C2,C3,C5,C6	82pF MQ300805	
C4,C10	10nF 0805	
C7	100pF MQ301111	
C8,C9,C11,C18	10uF 1210	
C12	270pF MQ301111	
C13	820pF MQ101111	
C14	300pF MQ101111	
C15	390pF MQ101111	
C16,C27	100pF MQ101111	
C17	910pF MQ101111	
C19	820pF MQ102525	
C20	750pF MQ102525	
C21	150pF MQ101111	
C26	330pF MQ102525	
C25	75pF MQ101111	
R1,R2	10KΩ 1206	
R3	6.8KΩ 1206	

Component	Description	Suggested Manufacturer
R4	2dB	
R5	RFT-300 Ω	TYT
L1	560nH/1008	/
L2	220nH/1008	/
L3,L4	680nH/1008	/
L5	Wire diameter 2mm,inner diameter 8mm 6turns	DIY
L6	Copper strip,2mm wide,inner diameter 10mm 3turns	DIY
L7	Copper strip,2mm wide,inner diameter 12mm 4turns	DIY
D1	LM4040BIM3-10.0/NOPB	/

Package Outline

Flangeless ceramic package;



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-C2					09/27/2018

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2026/3/19	Rev 1.0	Preliminary datasheet
2026/4/15	Rev 1.1	Add 27.12MHz 1300W reference design

Application data based on HL-26-10/11，SYX-26-22

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