

YC1271VP LDMOS TRANSISTOR

Document Number: YC1271VP
Preliminary Datasheet V1.0

700W, 50V High Power RF LDMOS FETs

Description

The YC1271VP is a 700-watt, high performance, internally matched LDMOS FET, designed for multiple applications with frequencies 960 to 1215MHz.

It is featured for high power and high ruggedness, suitable for Industrial, Scientific and Medical application, as well as Avionics applications.

It is recommended to use this device under pulse condition only.

- Typical Performance (on Yingtron's test fixture with device soldered): $V_{ds} = 50\text{ V}$, $I_{dq} = 100\text{ mA}$, Pulse width: 100 μs , duty cycle: 10%,



Freq(MHz)	P3dB(dBm)	Gain(dB)	EFF(%)
960	60.4	13.8	46.1
1000	60.6	15.1	51.3
1030	60.4	15.2	53.5
1050	60.2	15.1	53.9
1090	59.7	14.6	52.4
1100	59.6	14.4	52.1
1150	59.3	13.7	48.3
1200	59.3	13.6	46.9
1215	59.2	13.7	46.0

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Internally Matched for Ease of Use
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Excellent thermal stability, low HCI drift
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	115	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+55	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
Thermal Resistance, Junction to Case, Case Temperature 80°C, 1000W Pout, Pulse width: 100 μs , duty cycle: 10%, $V_{ds}=50\text{ V}$, $I_{DQ} = 100\text{ mA}$	$R_{\theta JC}$	0.02	°C/W

Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics (TA = 25 °C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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DC Characteristics

Drain-Source Breakdown Voltage ($V_{GS}=0V$; $I_D=100\mu A$)	V_{DSS}		115		V
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 50 V$, $V_{GS} = 0 V$)	I_{DSS}			10	μA
Gate--Source Leakage Current ($V_{GS} = 6 V$, $V_{DS} = 0 V$)	I_{GSS}			1	μA
Gate Threshold Voltage ($V_{DS} = 50V$, $I_D = 600\mu A$)	$V_{GS(th)}$		1.6		V
Gate Quiescent Voltage ($V_{DD} = 50 V$, $I_{DQ} = 600 mA$, Measured in Functional Test)	$V_{GS(Q)}$		2.85		V

Functional Tests (In Yingtron test fixture, 50 ohm system) : $V_{DD} = 50 Vdc$, $I_{DQ} = 100 mA$, $f = 1030 MHz$, Pulse CW Signal Measurements. (Pulse Width=100 μs , Duty cycle=10%)

Power Gain @ P3dB	G_p		15.2		dB
3dB Compression Point	P3dB		60.4		dBm
Drain Efficiency@P3dB	η_D		53.5		%
Input Return Loss	IRL		-4		dB

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Reference Circuit of Test Fixture Assembly Diagram

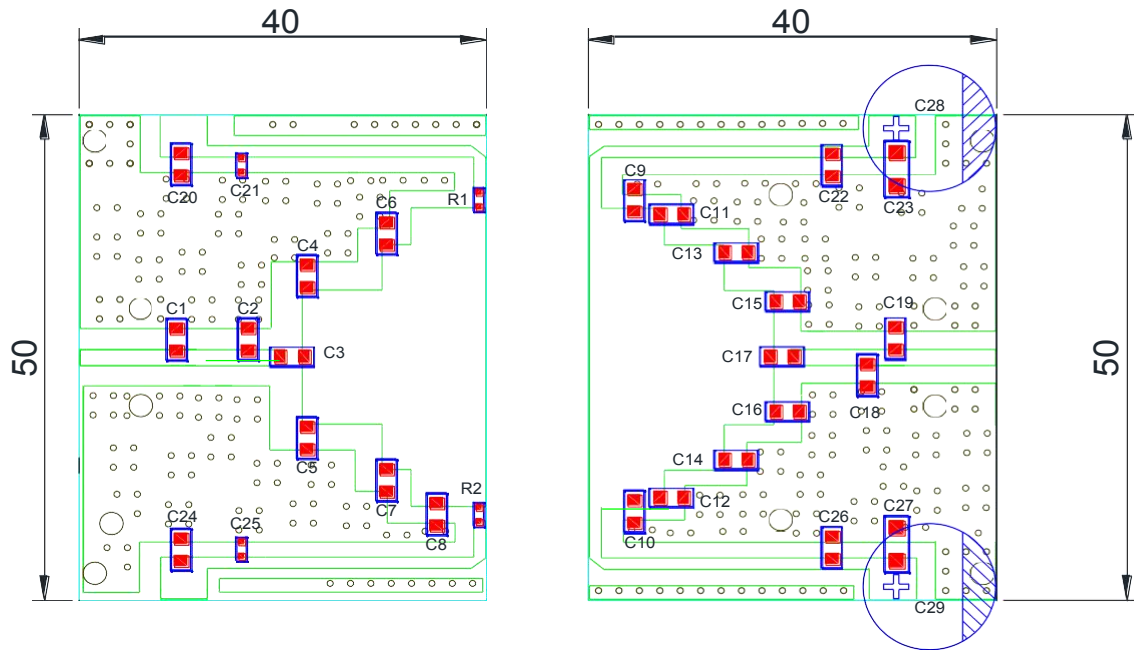


Figure 1. Test Circuit Component Layout

Table 1. Test Circuit Component Designations and Values

Component	Description	Suggested Manufacturer
C1	2.0pF	ATC800B
C2	3.0pF	ATC800B
C3,C17,C22,C26	39 pF	ATC800B
C4,C5	3.3 pF	ATC800B
C6,C7	2.2 pF	ATC800B
C8,C9,C10	5.6 pF	ATC800B
C11,C12,C13,C14	3.9 pF	ATC800B
C15,C16,C18,	2.7 pF	ATC800B
C19	2.4 pF	ATC800B
C21,C25	33 pF	ATC600F
C20,C23,C24,C27	Electrolytic Capacitor ,10uF,50V	
R1,R2	Chip Resistor,10 Ω ,0805	
C28,C29	Electrolytic Capacitor ,470uF,63V	
PCB	0.762mm [0.030"] thick, ε=3.48, Rogers RO4350B, 1 oz. copper	

TYPICAL CHARACTERISTICS

Condition: $V_{ds} = 50\text{ V}$, $I_{dq} = 100\text{ mA}$,

Pulse width: 100uS, duty cycle: 10%.

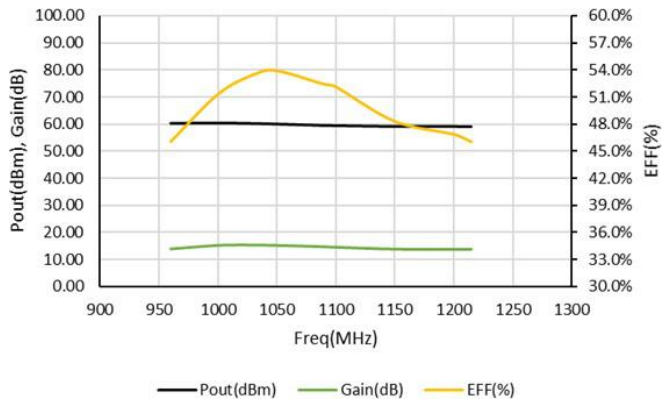


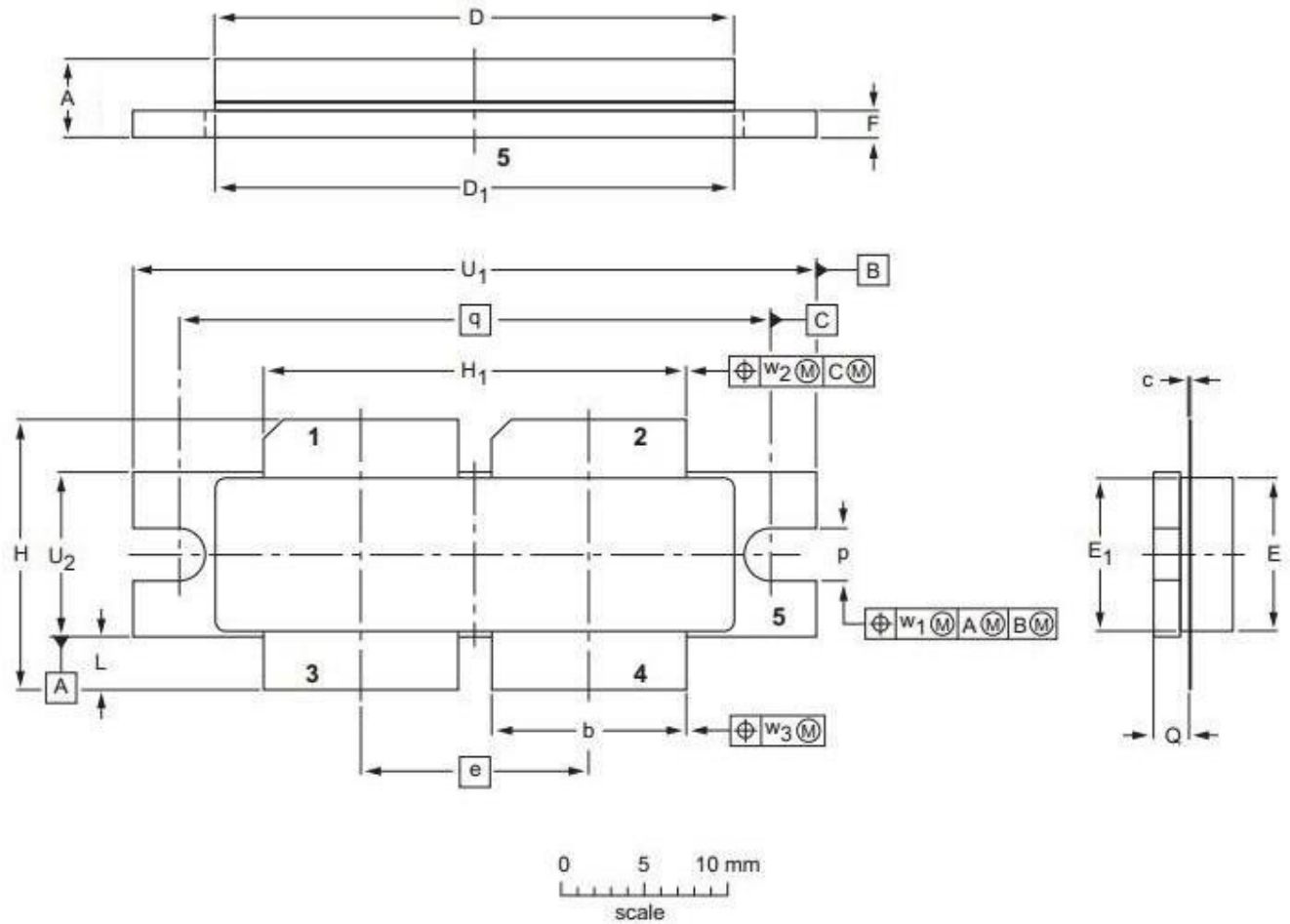
Figure 2. Power Gain and Drain Efficiency as Function of Pulse Output Power (960-1215MHz)

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Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads (1、2—DRAIN、3、4—GATE、5—SOURCE)



UNIT	A	b	c	D	D ₁	e	E	E ₁	F	H	H ₁	L	p	Q	q	U ₁	U ₂	W ₁	W ₂	W ₂
Mm	4.7	11.81	0.18	31.55	31.52	13.72	9.50	9.53	1.75	17.12	25.53	3.48	3.30	2.26	35.56	41.28	10.29	0.25	0.51	0.25
	4.2	11.56	0.10	30.94	30.96		9.30	9.27	1.50	16.10	25.27	2.97	3.05	2.01		41.02	10.03			
Inches	0.185	0.465	0.007	1.242	1.241	0.540	0.374	0.375	0.069	0.674	1.005	0.137	0.130	0.089	1.400	1.625	0.405	0.01	0.02	0.01
	0.165	0.455	0.004	1.218	1.219		0.366	0.365	0.059	0.634	0.995	0.117	0.120	0.079		1.615	0.395			

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-D4E					03/12/2013

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Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2018/10/12	Rev 1.0	Preliminary Datasheet Creation

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