

YC051K1VPX LDMOS TRANSISTOR

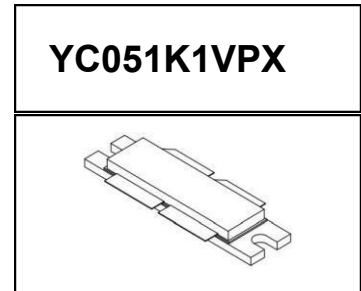
Document Number: YC051K1VPX
Preliminary Datasheet V1.2

1000W, 50V High Power RF LDMOS FETs

Description

The YC051K1VPX is a 1000-watt capable, high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 500MHz. It is also featured with high ruggedness as well.

It is featured for high power and high ruggedness, suitable for Industrial, Scientific and Medical application, as well as FM radio, VHF TV and Aerospace applications.



- Typical Performance (On Yingtron FM fixture with device soldered):

$V_{DD} = 50$ Volts, $I_{DQ} = 200$ mA, CW.

Freq (MHz)	Trade off	Pout(W)	Gain (dB)	Eff (%)
88-108	Power tuned	1120	18	75
88-108	Efficiency tuned	1020	20	79

- Typical Performance (On Yingtron narrow band fixture with device soldered):

$V_{DD} = 50$ Volts, $I_{DQ} = 1300$ mA, CW.

Freq(MHz)	Pout(dBm)	Gain(dB)	Eff(%)
1.6	56	23.3	52
5	56	22.8	58
10	56	21.5	59
15	56	21.3	59
20	56	22.2	56
25	56	23.4	53
30	56	23	51

- Typical Performance (On Yingtron narrow band fixture with device soldered):

$V_{DD} = 50$ Volts, $I_{DQ} = 1300$ mA, 2-Tone CW Signal with Spacing 650Hz

Freq(MHz)	Pavg(dBm)	Gain(dB)	Eff(%)	IMD3(dBc)
1.6	53	23.6	40	-34
5	53	22.7	44	-33
10	53	21.6	45	-35
15	53	21.3	45	-36
20	53	22.2	43	-35
25	53	23.4	41	-33
30	53	22.9	39	-32.5

- Typical Performance (On Yingtron narrow band fixture with device soldered):

$V_{DD} = 50$ Volts, $I_{DQ} = 100$ mA, Pulse CW: Pulse width=200uS, Duty Cycle=20%.

Freq(MHz)	$P_{SAT}(W)$	$G_P(dB)$	Eff(%)
27	1072	24.5	70

YC051K1VPX LDMOS TRANSISTOR

Document Number: YC051K1VPX
Preliminary Datasheet V1.2

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_{DS}	125	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 CW, 50 Vdc, $I_{DQ} = 100$ mA	$R_{\theta JC}$	0.15	°C/W

Table 3. ESD Protection Characteristics

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

DC Characteristics

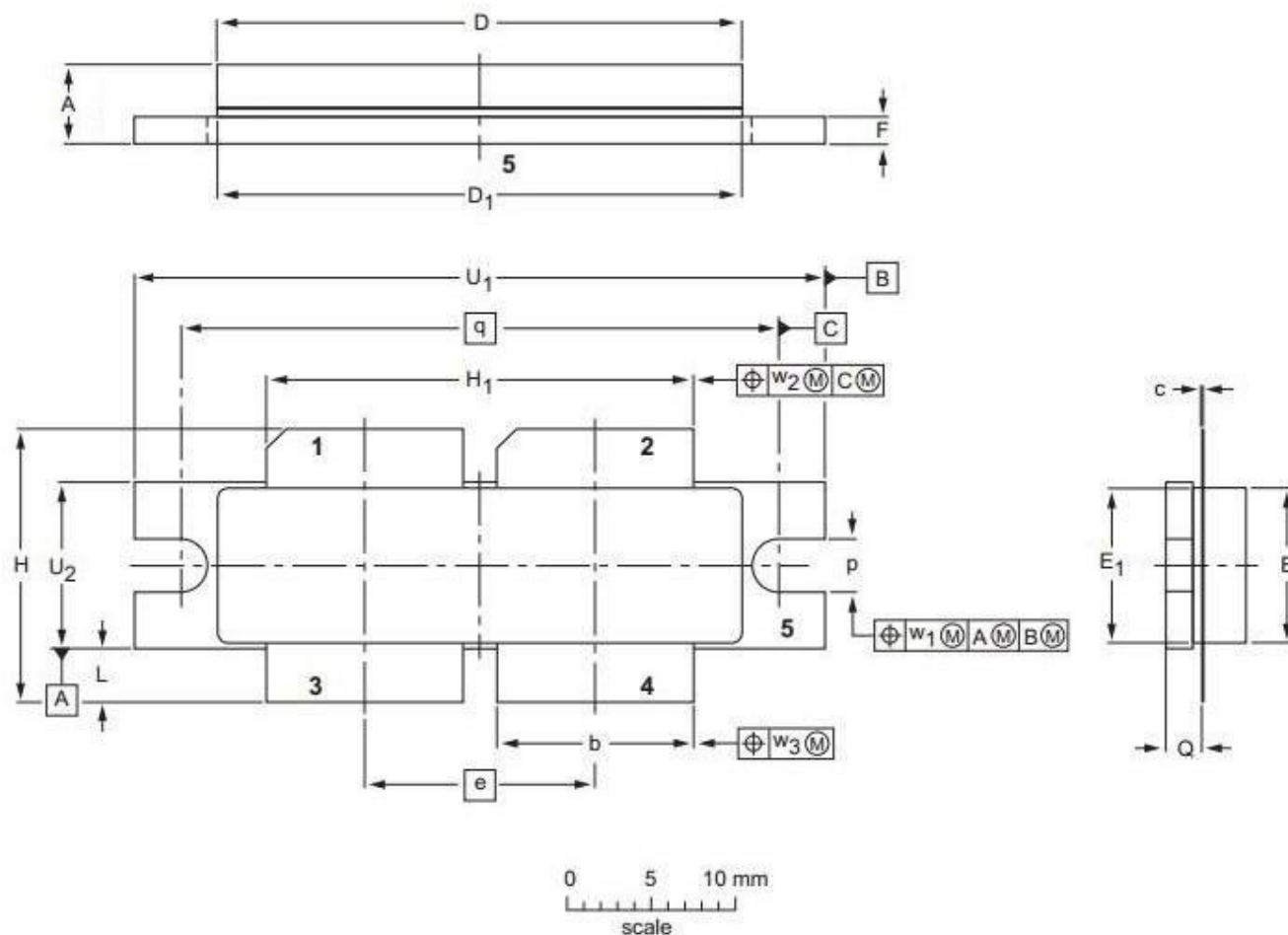
Drain-Source Voltage $V_{GS}=0$, $I_{DS}=1.0$ mA	$V_{(BR)DSS}$		125		V
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 50$ V, $V_{GS} = 0$ V)	I_{DSS}	---	---	1	μ A
Gate--Source Leakage Current ($V_{GS} = 10$ V, $V_{DS} = 0$ V)	I_{GSS}	---	---	1	μ A
Gate Threshold Voltage ($V_{DS} = 50$ V, $I_D = 600$ μ A)	$V_{GS(th)}$	---	2.54	---	V
Gate Quiescent Voltage ($V_{DD} = 50$ V, $I_D = 400$ mA, Measured in Functional Test)	$V_{GS(Q)}$	---	3.1	---	V
Drain source on state resistance ($V_{DS} = 0.1$ V, $V_{GS} = 10$ V) Each section side of device measured	$R_{ds(on)}$		108		m Ω
Common Source Input Capacitance ($V_{GS} = 0$ V, $V_{DS} = 50$ V, $f = 1$ MHz) Each section side of device measured	C_{ISS}		430		pF
Common Source Output Capacitance ($V_{GS} = 0$ V, $V_{DS} = 50$ V, $f = 1$ MHz) Each section side of device measured	C_{OSS}		100.7		pF
Common Source Feedback Capacitance ($V_{GS} = 0$ V, $V_{DS} = 50$ V, $f = 1$ MHz) Each section side of device measured	C_{RSS}		1.59		pF

YC051K1VPX LDMOS TRANSISTOR

Document Number: YC051K1VPX
Preliminary Datasheet V1.2

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

YC051K1VPX LDMOS TRANSISTOR

Document Number: YC051K1VPX
Preliminary Datasheet V1.2

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2018/04/20	Rev 1.0	Preliminary Datasheet
2018/9/27	Rev 1.1	Update on power rating, Upper frequency limits, and Rth
2019/12/25	Rev 1.2	Update on upper frequency limits, add FM test data according to RC design

Disclaimers

Specifications are subject to change without notice. Yingtron believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Yingtron for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Yingtron. Yingtron makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose. "Typical" parameters are the average values expected by Yingtron in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer's technical experts for each application. Yingtron products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Yingtron product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with us.

Copyright by Yingtron Microwave Electronics Co., Ltd.