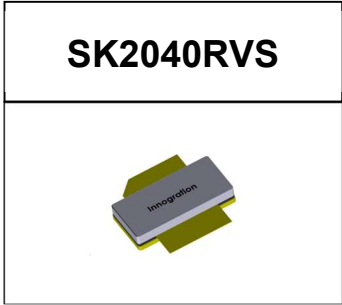




GaN HEMT 50V, 400W, 2GHz RF Power Transistor



Description

The SK2040RVS is a 400W, single ended GaN HEMT, designed for multiple applications with Frequencies up to 2GHz. It is optimized thermally to better support wideband CW application. There is no guarantee of performance when this part is used in applications designed outside of these frequencies.

- Typical RF performance on wideband application board with device soldered

SK2040RVS Vds=50V Vgs=-3.31V Idq=200mA CW								
Freq(MHz)	Psat(dBm)	Psat(W)	IDS(A)	Pin(dBm)	Gain(dB)	Eff(%)	2nd(dBc)	3rddBc)
800	56.59	456.04	14.2	40.91	15.68	64.23	-11.0	-45.0
850	56.21	417.83	12.5	40.93	15.28	66.85	-17.0	-65.0
900	56.58	454.99	13.4	40.69	15.89	67.91	-25.0	-60.0
950	56.18	414.95	11.79	39.42	16.76	70.39	-28.0	-52.0
1000	55.51	355.63	11	39.54	15.97	64.66	-23.8	-51.7

Applications

- L band power amplifier application
- P band power amplifier application

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set VGS to the pinch-off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically -5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+200	Vdc
Gate--Source Voltage	V _{GS}	-8 to +0.5	Vdc
Operating Voltage	V _{DD}	32	Vdc
Maximum gate current	I _{gs}	50	mA
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 by FEA T _c = 85°C, at Pd=200W,	R _{θJC}	0.6	°C /W

Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)

DC Characteristics



Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=50mA	V _{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 50mA	V _{GS(th)}	-4		-2	V
Gate Quiescent Voltage	VDS =50V, IDS=200mA, Measured in Functional Test	V _{GS(Q)}		-3.2		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	50V 2GHz, Pout=400W pulsed CW, All phase, No device damages	VSWR		10:1		

Figure 1: Picture of application board for 800-1000MHz Class AB

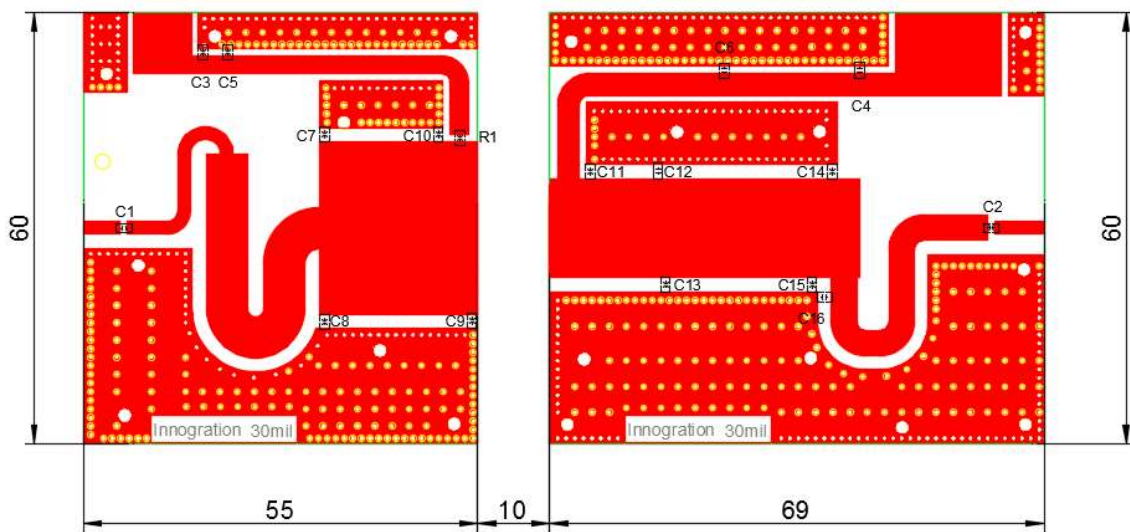


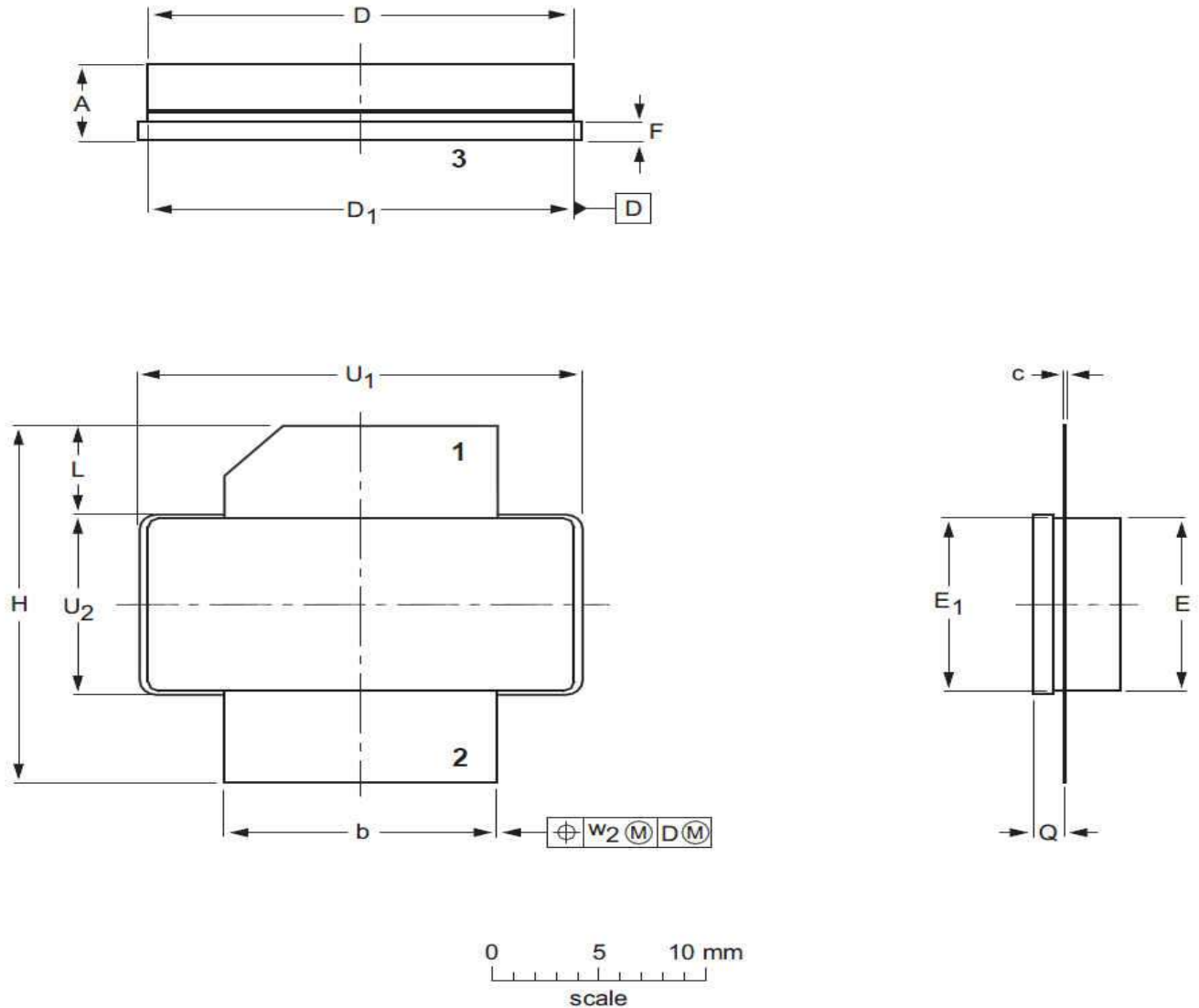
Table 4. Bill of materials of application board (PCB layout upon request)

C1	56PF	MQ301111
C2	68pF	Huamao MCM-1-300V-D-680J
C3,C4	10uF/100V	Ceramic multilayer capacitor
C5,C6	82pF	MQ301111
C7,C8	7.5pF	MQ301111
C9,C10	8.2pF	MQ301111
C11	6.8pF	MQ301111
C12	6.2pF	MQ301111
C13	3.3pF	MQ301111
C14	1.2pF	MQ301111
C15	3.6pF	MQ301111
C16	1.0pF	MQ301111
R1	10Ω 0805	Chip Resistor
PCB	Rogers 4350 30mil	



Package Outline

Earless flanged ceramic package; 2 leads (1—DRAIN、2—GATE、3—SOURCE)



UNIT	A	b	c	D	D ₁	E	E ₁	F	H	L	Q	U ₁	U ₂	W ₂
mm	4.72	12.83	0.15	20.02	19.96	9.50	9.53	1.14	19.94	5.33	1.70	20.70	9.91	0.25
	3.43	12.57	0.08	19.61	19.66	9.30	9.25	0.89	18.92	4.32	1.45	20.45	9.65	
inches	0.186	0.505	0.006	0.788	0.786	0.374	0.375	0.045	0.785	0.210	0.067	0.815	0.390	0.010
	0.135	0.495	0.003	0.772	0.774	0.366	0.364	0.035	0.745	0.170	0.057	0.805	0.380	

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B2					03/12/2013



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/11/8	V1.0	Production Datasheet Creation

Application data based on HL-23-55

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