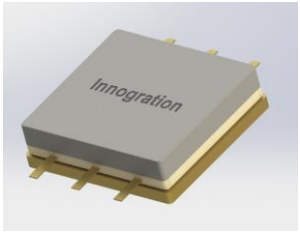
0.1-3GHz, 25W, 50V GaN Fully matched PA Module



Description

The SMAV0130-25H2C is a 25-watt,CW capable,single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 100MHz to 3GHz. The module is 50 Ω input/output matched and requires minimal external components.

When extended to 0.1-3.6GHz, it can deliver 20W across the full band.

Please read carefully the soldering notice for H2C package on last page

V_{DS}= 50V, I_{DQ}=36 mA CW

Parameter	0.1GHz	0.5GHz	1.0GHz	1.5GHz	2.0GHz	2.5GHz	3.0GHz	Units
Linear Gain	11.3	10.5	11.0	11.0	11.4	11.3	11.7	dB
Gain@Pin=36dBm	8.6	8.4	8.7	8.5	8.8	8.5	8.4	dB
Pout@Pin=36dBm	28.9	27.4	29.4	28.0	29.9	28.2	27.5	W
PAE@Pin=36dBm	61	56	52	48	48	47	44	%

Parameter	0.1GHz	0.5GHz	1.0GHz	1.5GHz	2.0GHz	2.5GHz	3.0GHz	3.6GHz	Units
Linear Gain	11.3	10.5	11.0	11.0	11.4	11.3	11.7	12.4	dB
Gain@Pin=34dBm	9.9	9.4	9.9	9.8	10.1	10.0	9.9	9.5	dB
Pout@Pin=34dBm	24.5	21.9	24.4	24.2	25.6	24.9	24.4	22.4	W
PAE@Pin=34dBm	59	53	50	44	43	42	40	37	%

Product Features

- Operating Frequency Range: 100MHz-3GHz (3.6GHz)
- Operating Drain Voltage: +50 V
- 50 Ω Input/Output
- Psat: ≥25W (CW) (20W)
- Small signal gain:>11dB, Power gain:>8dB
- Minimum efficiency:40%
- 6x10 mm Surface Mount Package
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Applications

- Ultra Broadband Amplifiers
- L/S band pulsed power Amplifier
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	200	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	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 T_C= 25°C, DC test	$R_{\theta JC}$	3.2	°C/W

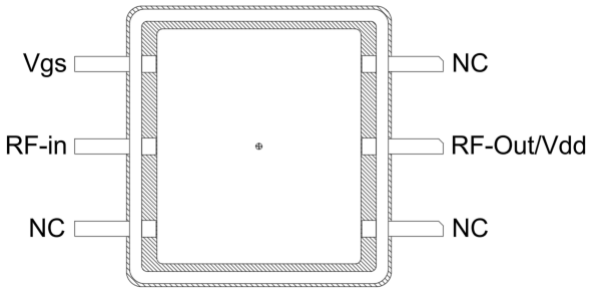
Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		100		3000	MHz
Power Gain @ Psat		11			dB
P_{SAT}		25			W
Drain Efficiency @ P_{SAT}		40			%
Unless otherwise noted: TA = 25°C, V_{DD} =50 V, Pulse Width=20 us, Duty cycle=10%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =50 V, I_{DQ} =50mA, f = 3GHz

VSWR 10:1 at Psat pulse CW Output Power	No Device Degradation

Pin Configuration and Description



Top View

Pin No.	Symbol	Description
	RF-Out/Vdd	Drain Bias & RF Output
	RF-in	RF Input
	Vgs	Gate Bias
	NC	No connection

0.1-3GHz

TYPICAL CHARACTERISTICS

Figure 1. Network analyzer output S11/S21 (Pin=0dBm)

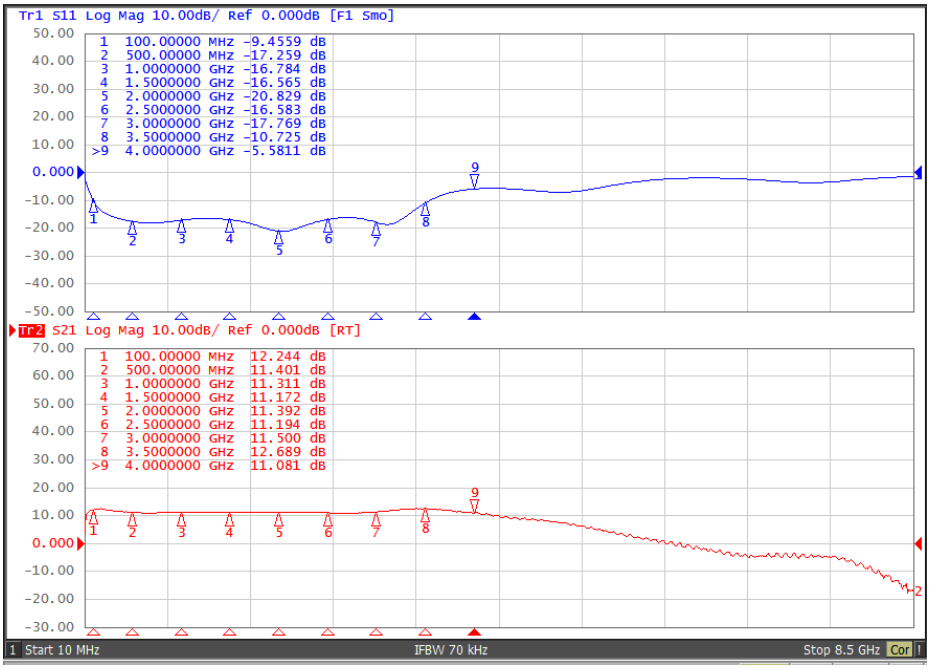


Figure 2 . AM/AM Plot

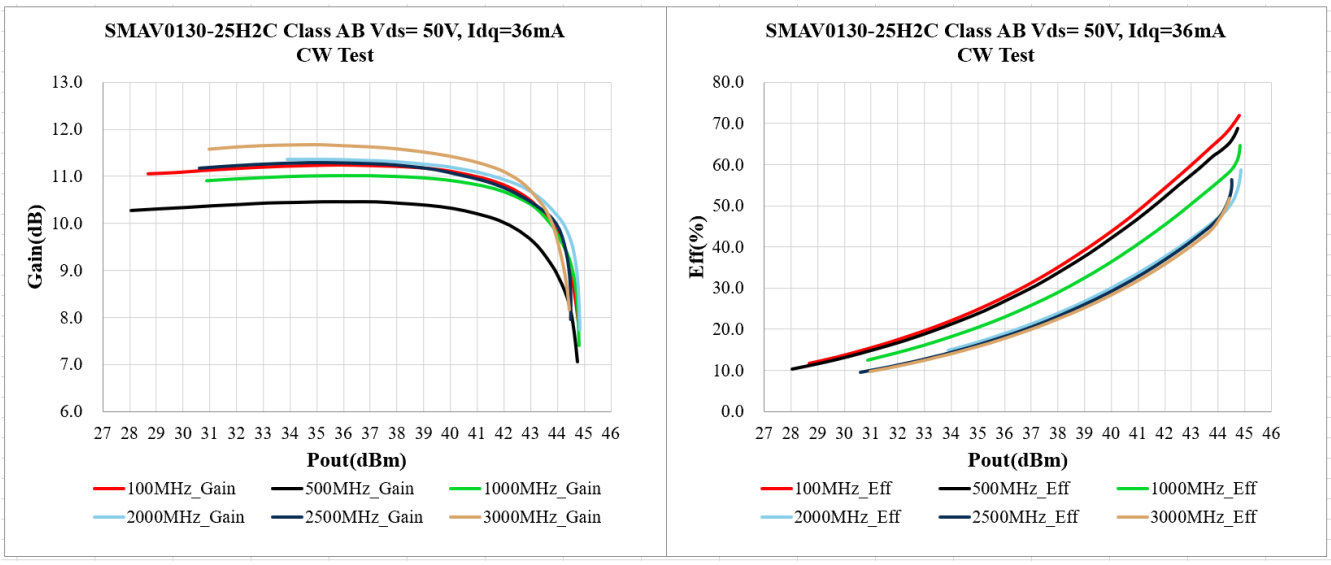
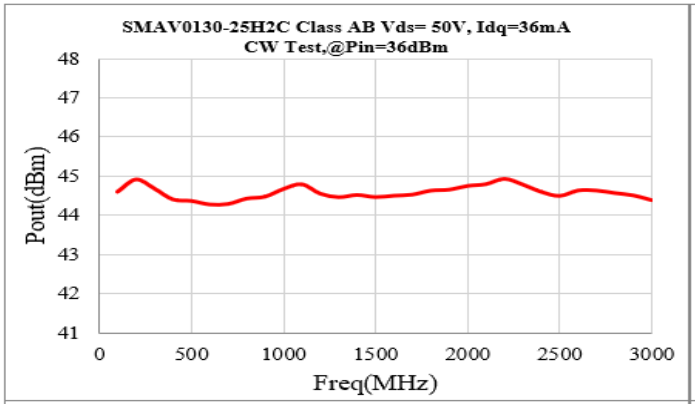
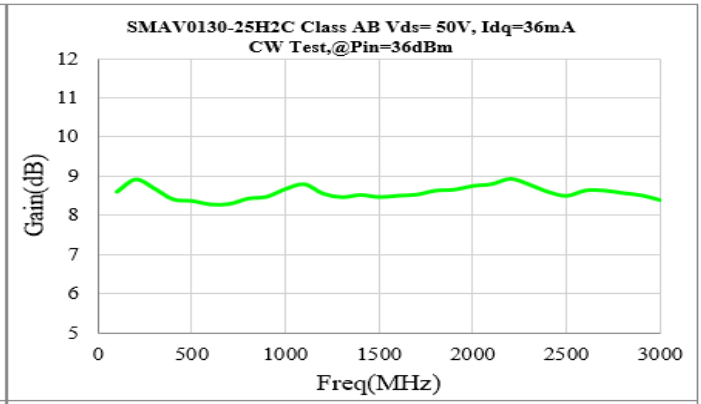
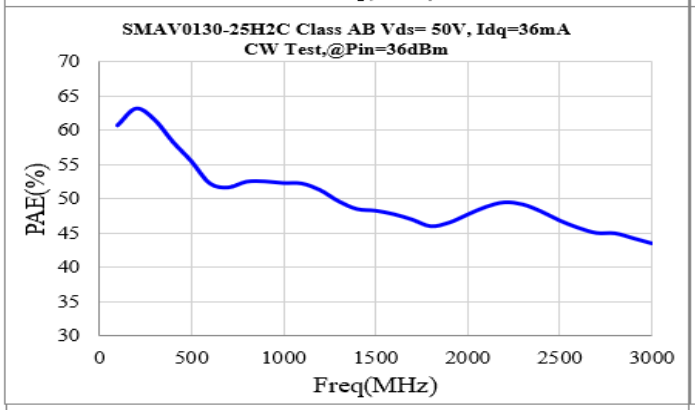
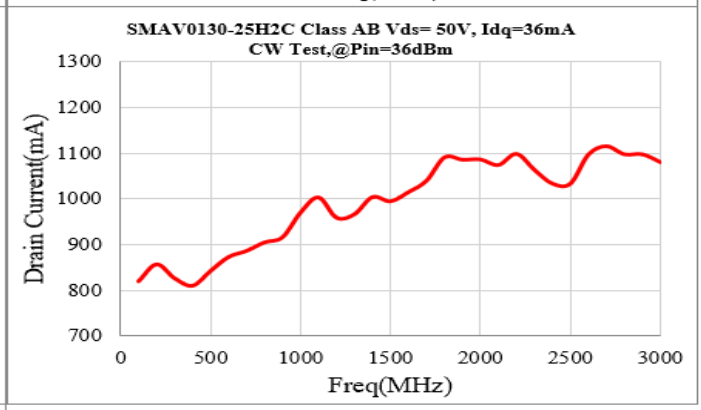


Figure 3. Pout, Power Gain and, efficiency vs. Frequency @Pin=36dBm









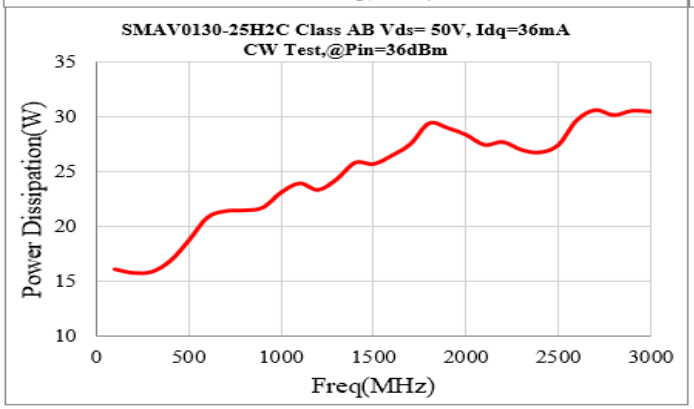
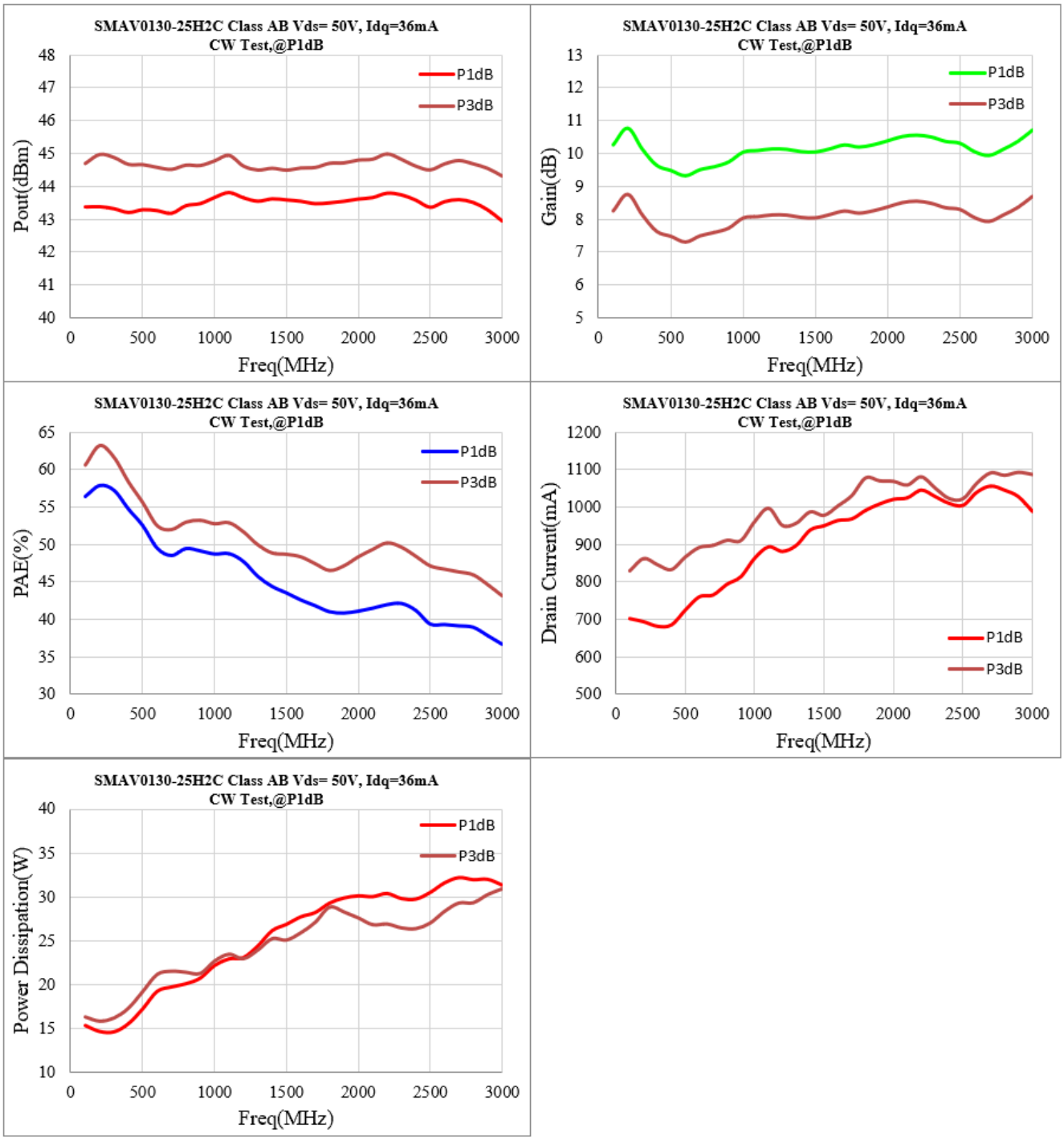
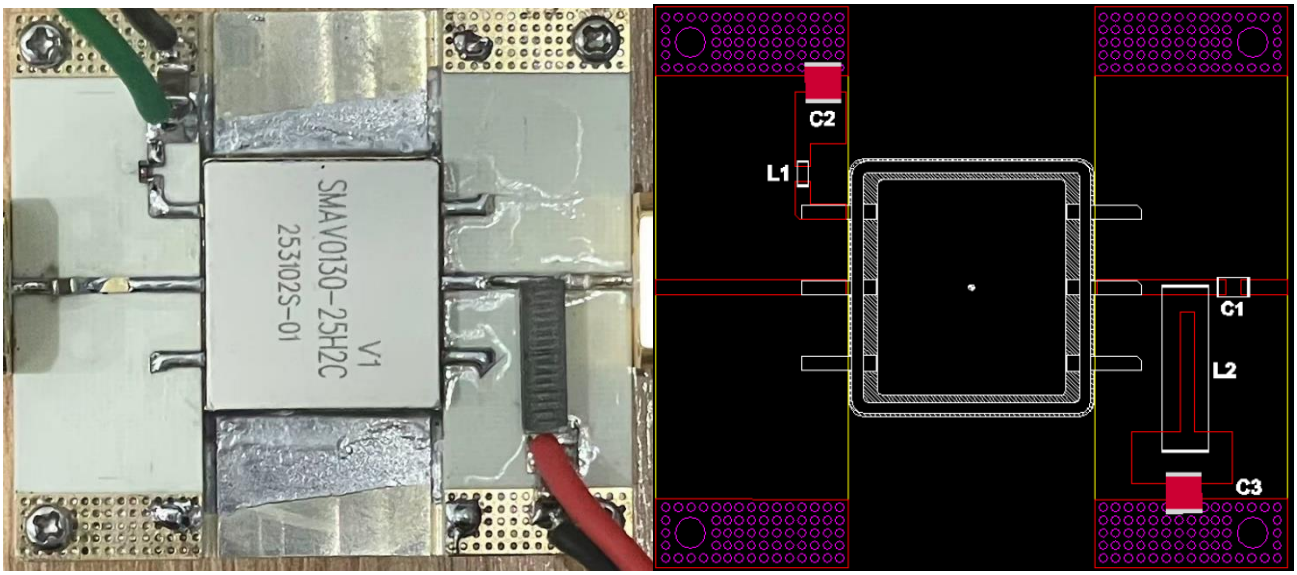


Figure 4. Pout, Power Gain and, efficiency vs. Frequency @P1dB，P3dB

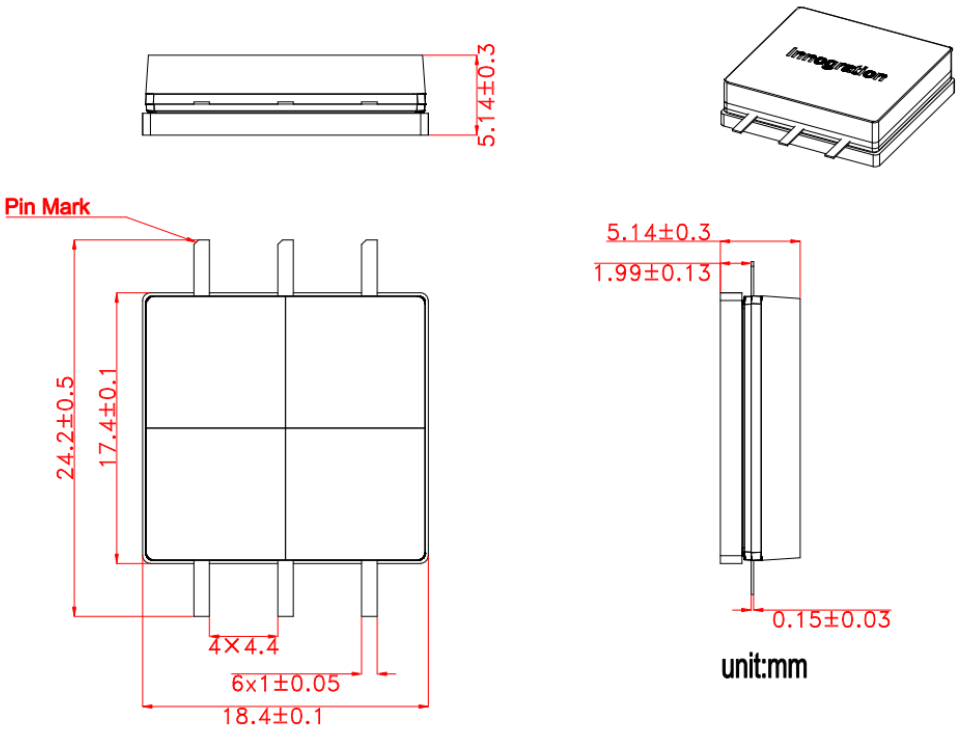


Reference Circuit of Test Fixture Assembly Diagram



		Part NO.	Vendor
L1	100 nH Inductor(0603)	LQW18CNR10K00D	muRata
C1	50V 1uF Chip Capacitor	GRM21BR71H105KA12L	muRata
C2,C3	10uF 100V Chip Capacitor	C5750X7S2A106M230KB	TDK
L2	1.3uH 4.2A Inductor	4310LC-132KEC	Coilcraft
PCB	RO4350B,20mil,er=3.48		

Package Dimensions （Unit:mm）



When soldering, the temperature of the iron tip must be below 220℃. The contact time between the iron tip and the pins should be as short as possible, not exceeding 10 seconds. The number of repeated soldering operations must not exceed 3 times. Otherwise, it may damage the bond between the ACP lead frame and the pins, resulting in failure of the component's sealing performance.

Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2025/8/7	Rev 1.0	Production Datasheet

Application data based on ZHH-25-20 (2+2*1.2)

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