



2.7-3.5GHz, 2 stages, 120W, S band 50V GaN Quasi-MMIC PA module

Description

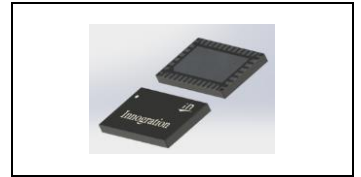
The S2MAV2735-120 is a 120-watt, 2 stage integrated Power Amplifier Module, designed for broad band saturated pulsed CW or linear back off applications, with frequencies from 2.7 to 3.5GHz. The module is 50 Ω input, and partially output matched and requires minimal external components, total effective size less than 2*2cm.

The module implements innovative quasi-MMIC transistor into module design, housed in cost effective 10*6mm plastic open cavity package, offers a much lower cost than traditional MMIC solutions.

It isn't recommended to use this module for any CW application.

- $V_{ds}=50V$, $I_{dq1}=20mA$, $I_{dq2}=190mA$ pulsed CW, 100 us width, 10% duty cycle.

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2700	47.99	62.9	35.5	23.37	51.51	141.6	48.4
2800	49.24	84.0	42.9	24.62	52.1	162.1	54.0
2900	49.53	89.7	46.4	24.78	51.93	155.9	55.7
3000	49.53	89.7	46.5	24.45	51.79	151.0	54.8
3100	49.32	85.6	44.8	24.15	51.5	141.4	52.6
3200	49.24	84.0	42.9	23.22	51.41	138.5	50.7
3300	49.2	83.1	41.4	22.7	51.29	134.6	48.6
3400	49.23	83.7	40.2	22.1	51.26	133.7	47.2
3500	49.37	86.5	39.4	21.43	51.29	134.5	46.0



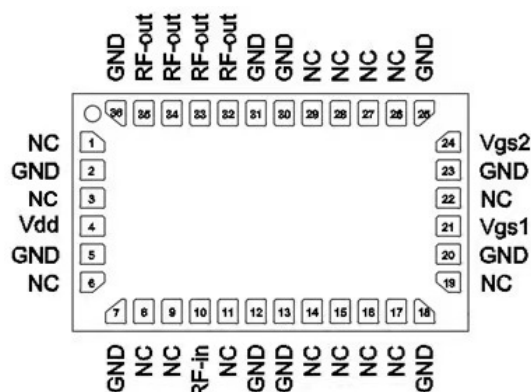
Product Features

- Operating Frequency Range: 2.7-3.5GHz
- Operating Drain Voltage: +50V
- 50 Ω Input, Output partially matched
- $P_{sat} \geq 120W$ @50V (Pulsed)
- Small signal gain:>22dB, Power gain:>20dB
- Efficiency:>45%
- 6x10 mm Surface Mount Package and total design less than 2x2 cm

Applications

- S band pulsed power amplifier within 2.7-3.5Gz

Pin Configuration and Description





Pin No.	Symbol	Description
32,33,34,35	RFout	RF Output
10	RFin	RF Input
21	Vgs1	Gate Bias for 1 st stage
24	Vgs2	Gate Bias2 for 2 nd stage
4	Vdd	Drain Bias for 1 st and 2 nd stage
Others	NC	No connection
2,5,7,12, 13,18,20,23,25, 30, 31,36 Package Base	GND	DC/RF Ground. Must be soldered to EVB ground plane over array of vias for thermal and RF performance. Solder voids under Pkg Base will result in excessive junction temperatures causing permanent damage.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	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, FEA $T_c = 25^\circ\text{C}$, 120W Pulsed CW at 3GHz	$R_{\theta JC}$	1.2	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		2700		3500	MHz
Power Gain		19	21		dB
P_{SAT}			51		dBm
Drain Efficiency @ P_{SAT}			45		%
Unless otherwise noted: $T_A = 25^\circ\text{C}$, $V_{DD} = 50\text{ V}$, Pulse Width=100 us, Duty cycle=10%					

Load Mismatch (On Test Fixture, 50 ohm system): $V_{DD} = 50\text{ V}$, $I_{DQ} = 20+190\text{ mA}$, $f = 3\text{ GHz}$

VSWR 10:1 at pulse CW Output Power @Pin=29dBm	No Device Degradation
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Reference Circuit of Test Fixture Assembly Diagram

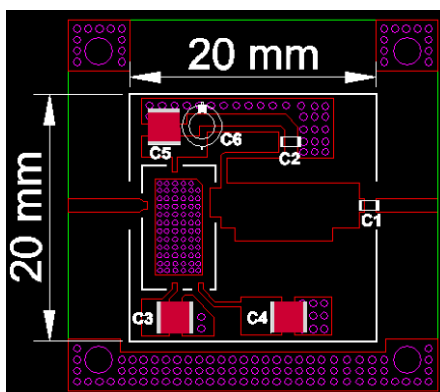


Figure 1. Test Circuit Component Layout

		Part NO.	Vendor
C3,C4,C5	10uF 100V Chip Capacitor	C5750X7S2A106M230KB	TDK
C1,C2	7.5pF Capacitor (0603)		
C6	100uF Capacitor		
PCB	RO4350B,20mil,er=3.48		

TYPICAL CHARACTERISTICS

Figure 2. Network analyzer output S11/S21 (Pin=0dBm)

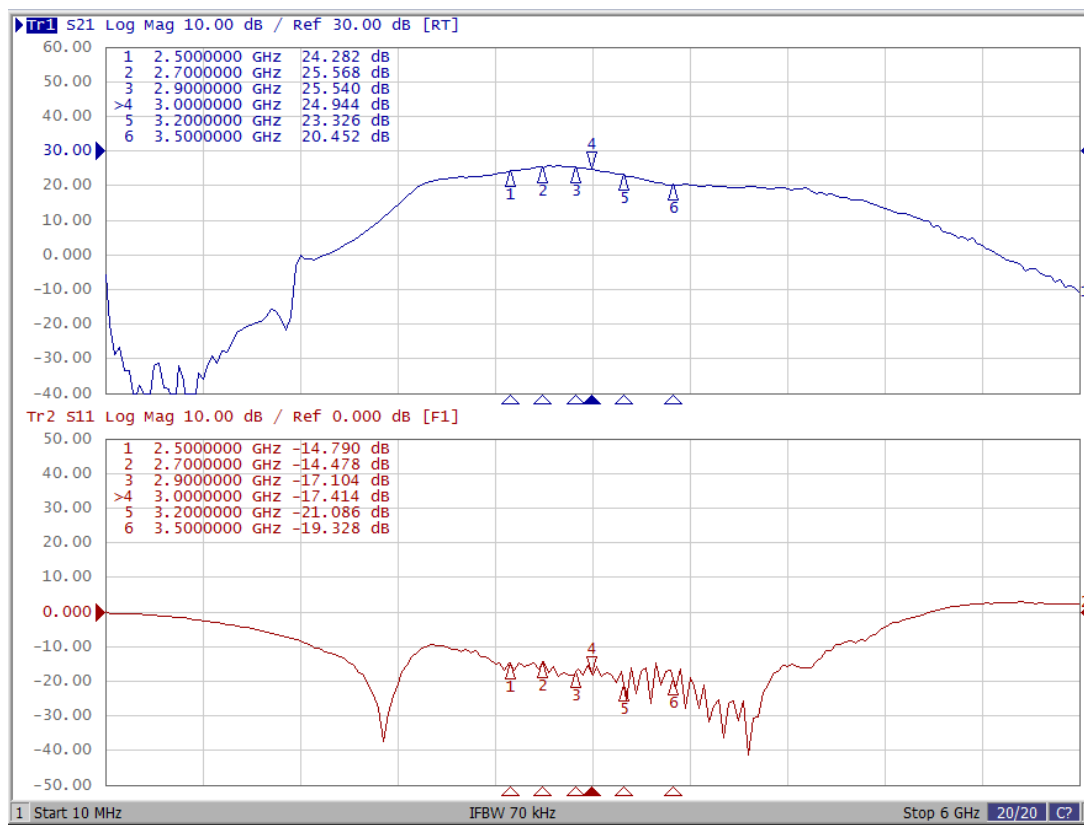




Figure 3. Power Gain and, efficiency and Pout @Pin=29dBm, P3dB vs. Frequency

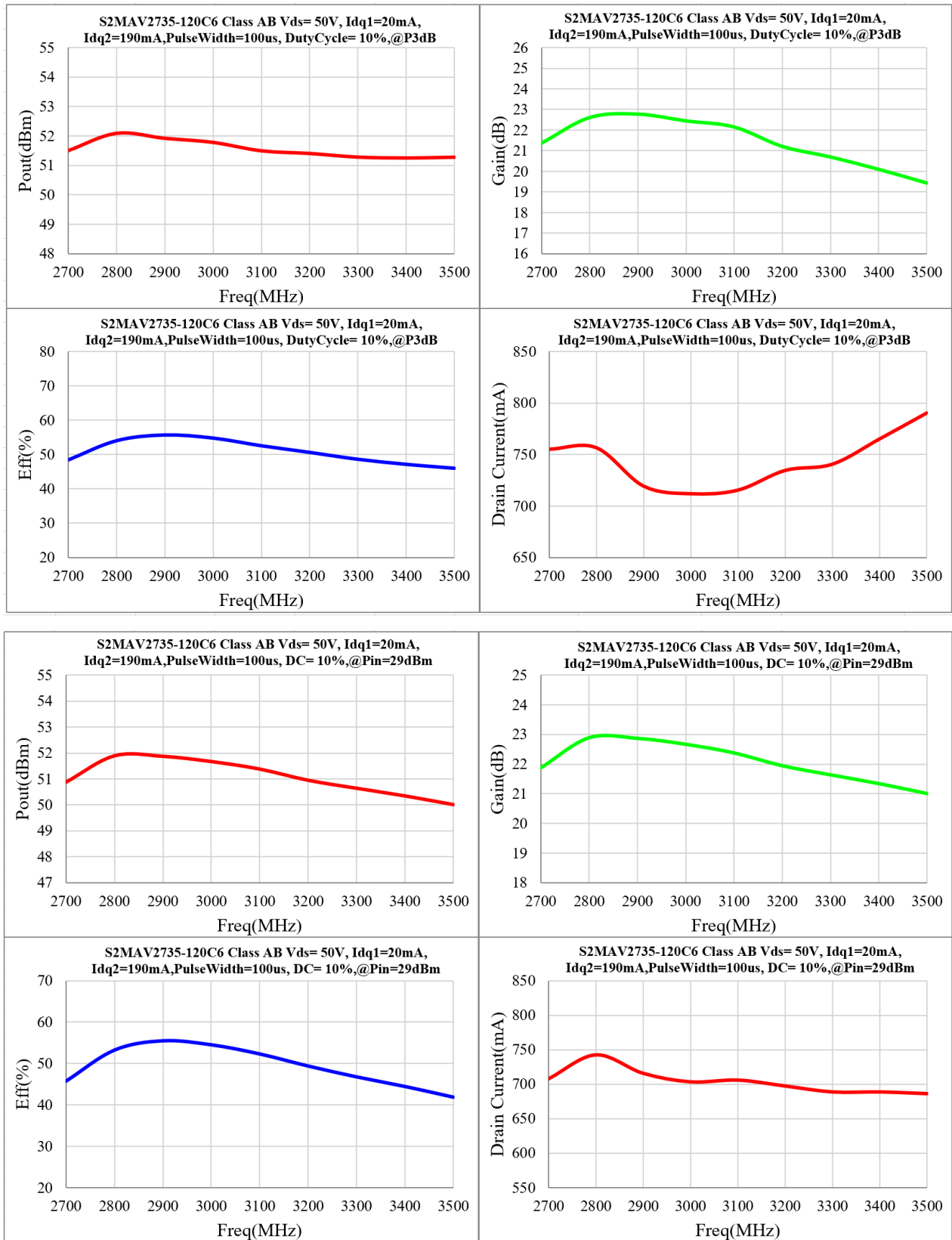
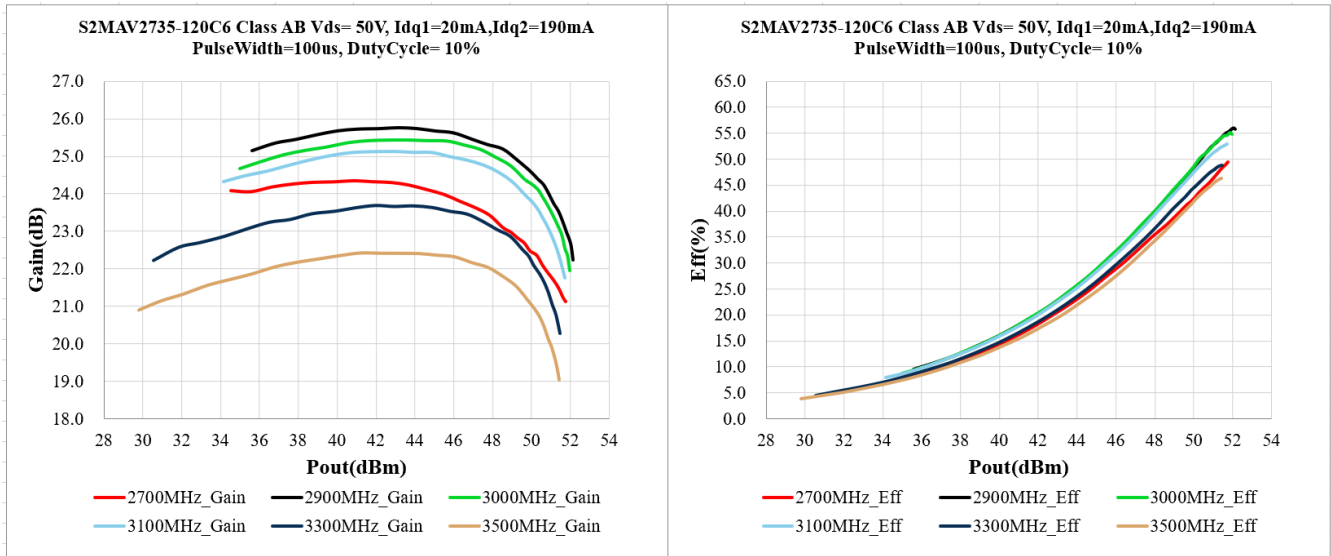


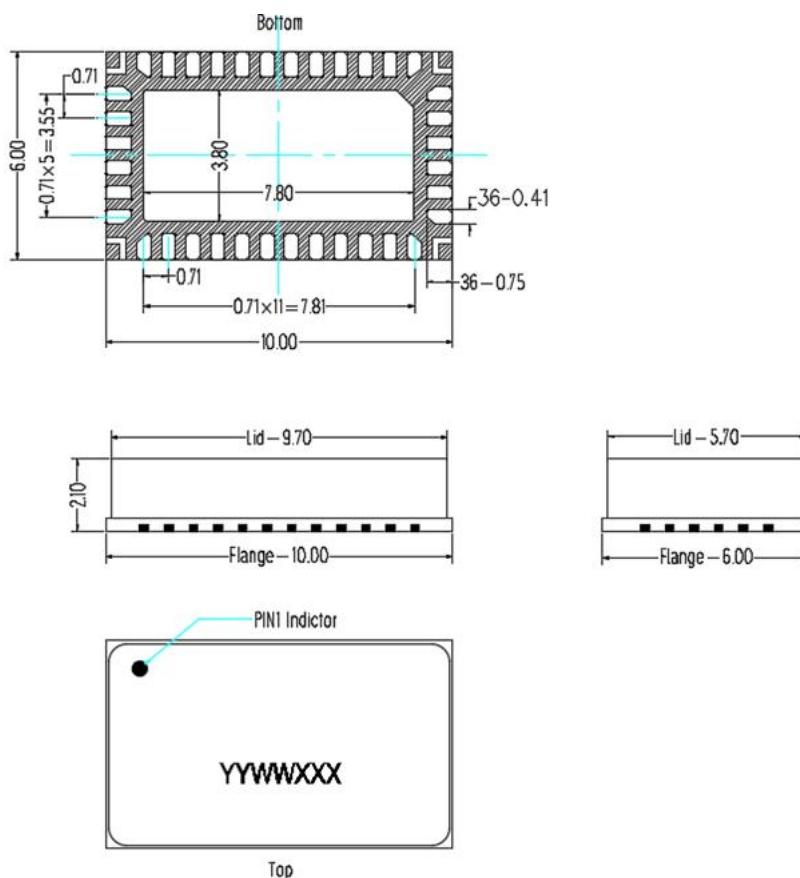


Figure 4. AM/AM Plot



Package Dimensions

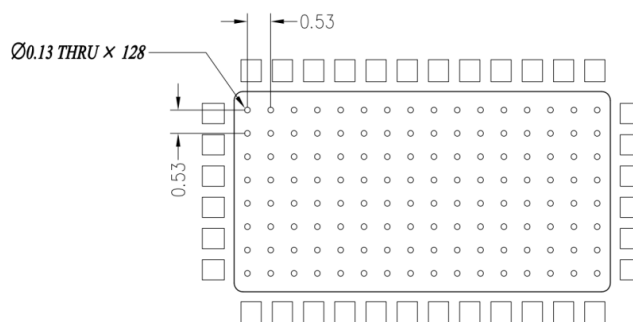
10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are $\pm 0.2\text{mm}$.

Mounting Footprint Pattern



Notes:

1. All dimensions are in mm;
2. Vias are required under the backside paddle of this device for proper RF/DC grounding and thermal dissipation. ALL vias are PTH to ground.



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2026/7/2	Rev 1.0	Preliminary Datasheet Creation

Application data based on ZHH-26-06

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