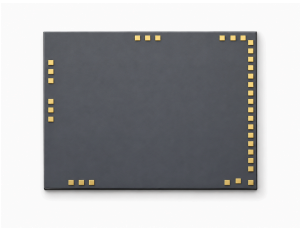
7000–13000 MHz GaAs MMIC Amplitude and Phase Control RF Front-End Die

LCI-APC-7000-13000 is a GaAs pHEMT bare die for 7000–13000 MHz, integrating switching, amplification and 6-bit phase and attenuation control for transmit and receive paths.



Phase step: 5.625 ° (typical); Attenuation range: 0.5 dB (minimum) / 31.5 dB (maximum); Small-signal gain: 12 dB (typical) (RX). Die dimensions: 4.55 × 3.54 × 0.1 mm.

RF characteristics

TA = +25 °C

Parameter	Symbol	Minimum	Typical	Maximum	Value	Unit
Operating frequency	-	7000	-	13000	-	MHz
Small-signal gain	-	-	12	-	RX	dB
Output 1 dB compression power	-	-	11	-	RX	dBm
Saturated output power	-	-	24	-	TX	dBm
Phase shift range	-	5.625	-	354.375	-	°
Phase step	-	-	5.625	-	-	°
RMS phase error	-	-	2	-	-	°
Attenuation range	-	0.5	-	31.5	-	dB
Attenuation step	-	-	0.5	-	-	dB
RMS attenuation error	-	-	0.5	-	-	dB
Input/output VSWR	-	-	-	2	-	-

DC bias and current

TA = +25 °C

Parameter	Symbol	Minimum	Typical	Maximum	Value	Unit
Operating current	-	-	0.1	-	-	A
Positive supply voltage	-	-	-	-	5 (VD1 / VD2)	V
Negative supply voltage	-	-	-	-	-5 (VS)	V

Bond-pad assignments

Pins	Symbol	Function	Notes
VS	VS	Power supply	–5 V
VD1 / VD2	VD1 / VD2	Power supply	+5 V
COM	COM	Common RF port	-
RX	RX	RF input	RX

Bond-pad assignments

Pins	Symbol	Function	Notes
TX	TX	RF output	TX
A1–A6	A1–A6	Attenuation control	TTL
P1–P6	P1–P6	Phase control	TTL
S1 / S2	S1 / S2	Switch control	TTL
G1 / G2	G1 / G2	Gain control	Floating: no attenuation; GND: attenuation

Control truth table (φ)

State	P6	P5	P4	P3	P2	P1
Reference state	0	0	0	0	0	0
−5.625°	0	0	0	0	0	1
−11.25°	0	0	0	0	1	0
−22.5°	0	0	0	1	0	0
−45°	0	0	1	0	0	0
−90°	0	1	0	0	0	0
−180°	1	0	0	0	0	0
354.375°	1	1	1	1	1	1

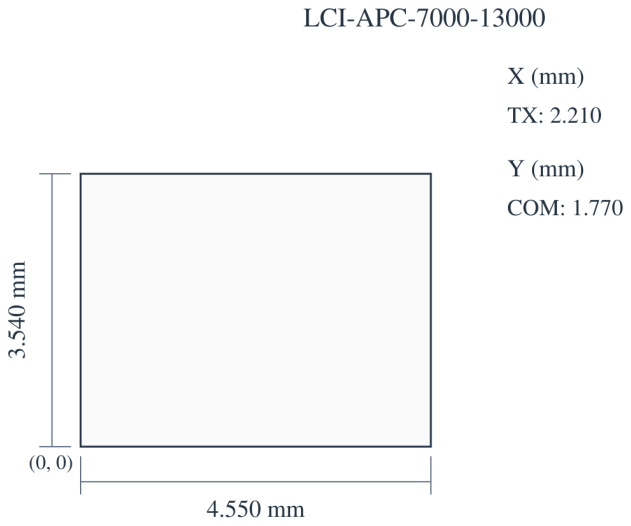
Control truth table (S1 / S2)

S1	S2	COM–TX	COM–RX	Load state
1	0	On	Off	Off
0	1	Off	On	Off
0	0	Off	Off	On
1	1	On	Off	Off

Die dimensions

Parameter	Value	Unit
Die dimensions	4.55 × 3.54 × 0.1	mm

Partial dimensional reference in mm. Fabrication and wire bonding require complete drawings.



4.550 × 3.540 × 0.100 mm

X → · Y ↑ · X, Y: mm

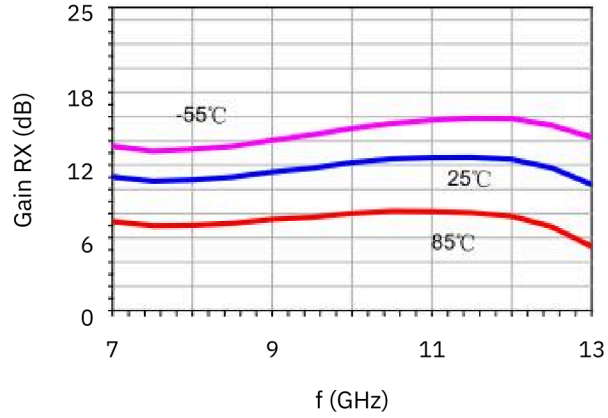
Current publication record · 1.6 · 2026-11-12. Product description or editorial content updated. Replaces revision 1.5.

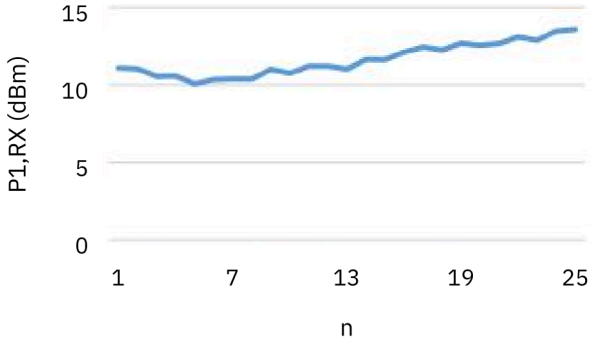
Die integration and bias sequencing

Control interface: Parallel TTL control. Apply the negative supply before the positive supply; remove the positive supply before the negative supply.

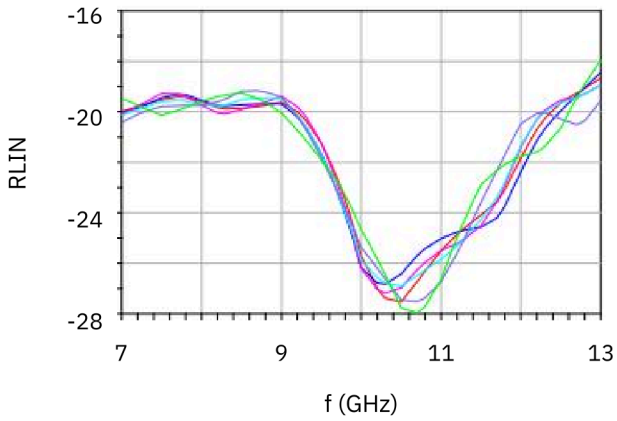
Performance curves

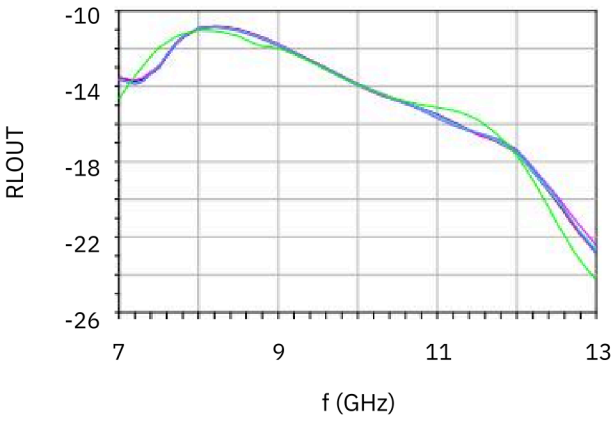
Each performance plot applies to its stated operating conditions.



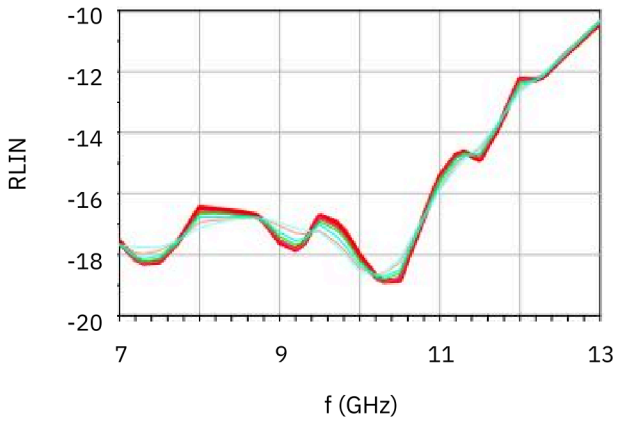


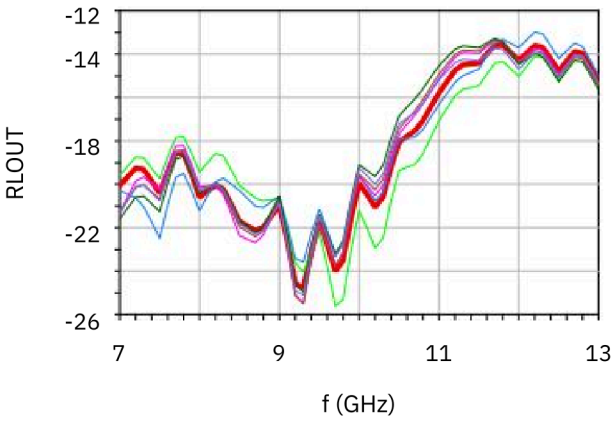


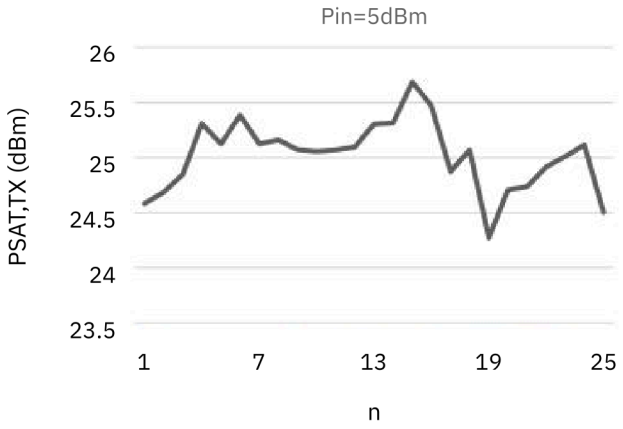




Rx — Gain_RX(dB); P1_RX(dBm); RLIN; RLOUT. The power-plot horizontal axis is indexed 1–25. Physical step size is unspecified. Axis units for RLIN/RLOUT are unspecified. Gain_RX: T = -55/25/85 °C.

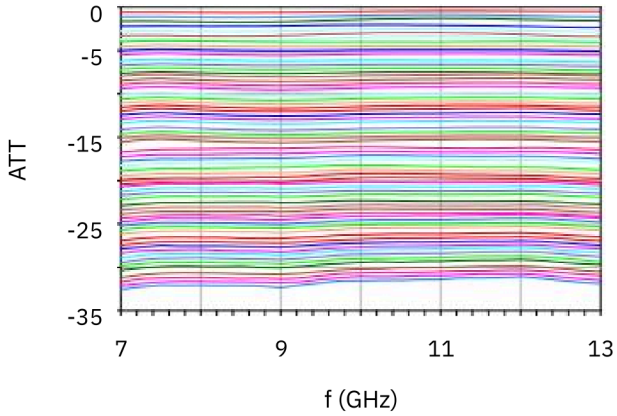


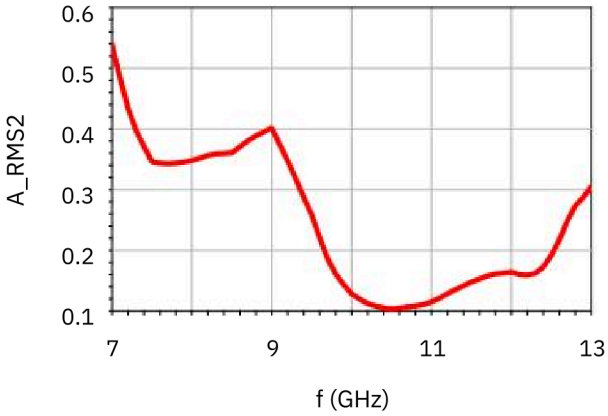


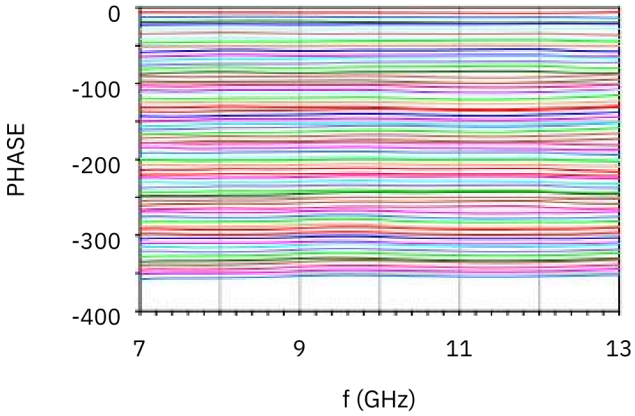


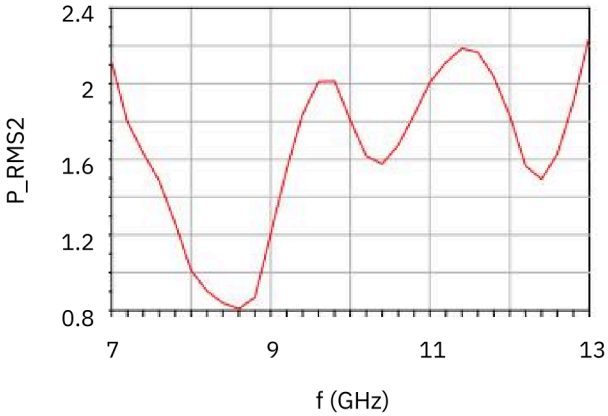
Tx — RLIN; RLOUT; PSAT_TX(dBm). The power-plot horizontal axis is indexed 1–25. Physical step size is unspecified. Axis units for RLIN/ RLOUT are unspecified. PSAT_TX: Pin = 5 dBm.

ATT; A_RMS2; PHASE; P_RMS2. Axis units for ATT/PHASE/A_RMS2/P_RMS2 are unspecified.









Document notice

Specifications are subject to revision. Before design release, confirm the current document revision and product-specific requirements with LCRF. The approved quotation and order documentation define the supplied configuration.