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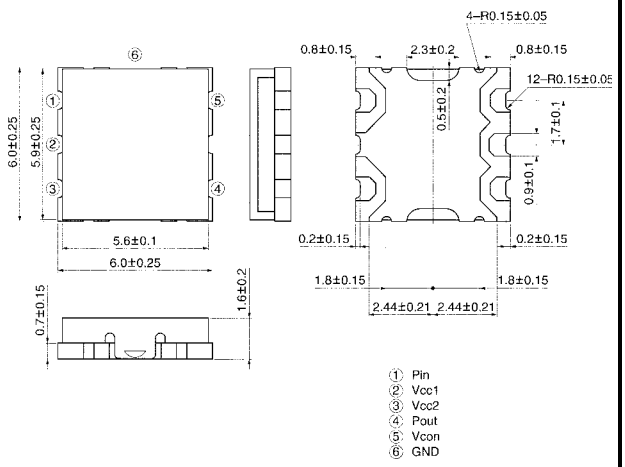
RF Power Amplifier Module

S-AU81

Power Amplifier Modules for Domestic cdmaOne

Unit: mm

- GaAs HBT Micro PA (on-chip bias circuit and matching circuit)
- Output power: P_o = 27.0dBmW (min)
- Gain: G_p = 28.0dB (typ.)
- Total current: I_t (1) = 385 mA (typ.)
  (@P_{out} = 27.0dBmW)
- Low-voltage operation: Operation at V_{CC} = 1.5 V is possible
  I_t (2) = 97 mA (typ) (@P_{out} = 14dBmW, V_{CC} = 1.5 V)
- This device features an output control pin which can be switched between low-power and high-power settings.
  I_t = 90 mA (typ.) (@P_{out} = 14dBmW, V_{CC} = 2.70 V)



JEDEC	—
JEITA	—
TOSHIBA	5-6A

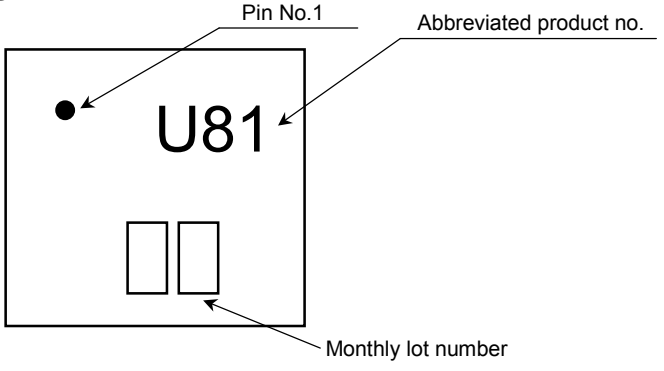
Weight: 0.0 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage 1	V_{CC1}	5	V
Supply voltage 2	V_{CC2}	5	V
Control voltage	V_{con}	4	V
Collector current	I_{CC}	1	A
Power dissipation	P_D (Note 1)	2	W
Operating temperature	T_{op}	−20~+60	°C
Storage temperature range	T_{stg}	−30~+125	°C

Note 1: Ta = 25°C

Marking



Electrical Characteristics (Tc = 25°C)

Characteristics		Symbol	Test Condition		Min	Typ.	Max	Unit
Power gain (1)		G_p (1)	V_{CC1}, $V_{CC\ 2}$ = 3.6 V, V_{con} = 2.85 V (Note 2), P_o = 27dBmW f = 887~925 MHz, P_{in} = adjust, Z_G = Z_L = 50 Ω		25.0	28.0	—	dB
Control current		I_{con}				—	3	5	mA
Total current (1)		I_t (1)				—	385	—	mA
Adjacent-channel power ratio (1)		ACPR1 (1)	V_{CC1}, $V_{CC\ 2}$ = 3.6 V, V_{con} = 2.85 V (Note 2), P_o = 27dBmW, f = 887~925 MHz, Z_G = Z_L = 50 Ω (Note 3)	900 kHz	—	−50	−45	dB
		ACPR2 (2)		1.98 MHz	—	−60	−56	dB
Power gain (2)		G_p (2)	V_{CC1}, $V_{CC\ 2}$ = 1.5 V, V_{con} = 2.85 V (Note 2), P_o = 14dBmW, f = 887~925 MHz, P_{in} = adjust, Z_G = Z_L = 50 Ω		21.0	24.0	—	dB
Total current (2)		I_t (2)			—	97	—	mA
Adjacent-channel power ratio (2)		ACPR1 (2)	V_{CC1}, $V_{CC\ 2}$ = 1.5 V, V_{con} = 2.85 V (Note 2), P_o = 14dBmW, f = 887~925 MHz, Z_G = Z_L = 50 Ω (Note 3)	900 kHz	—	−50	−45	dB
		ACPR2 (2)		1.98 MHz	—	−60	−56	dB
Power gain (3)		G_p (3)	V_{CC1}, $V_{CC\ 2}$ = 3.6 V, V_{con} = 2.85 V (Note 2), P_o = 27dBmW, f = 887~925 MHz, P_{in} = adjust, Z_G = Z_L = 50 Ω), Tc = −20~+60°C		24.0	27.0	—	dB
Adjacent-channel power ratio (3)		ACPR1 (3)	V_{CC1}, $V_{CC\ 2}$ = 3.6 V, V_{con} = 2.85 V (Note 2), P_o = 27dBmW, f = 887~925 MHz, Z_G = Z_L = 50 Ω, Tc = −20~+60°C (Note 3)	900 kHz	—	−48	−43	dB
		ACPR2 (3)		1.98 MHz	—	−58	−55	dB
VSWRin		VSWRin	V_{CC1}, $V_{CC\ 2}$ = 3.6 V, V_{con} = 2.85 V (Note 3), P_o = 27dBmW, f = 887~925 MHz, P_{in} = adjust, Z_G = Z_L = 50 Ω		—	2	3	—
Harmonics	2fo	HRM (1)			—	—	−30	dB
	3fo	HRM (2)			—	—	−45	dB
Stability		SPR	V_{CC1}, $V_{CC\ 2}$ = 1.5 V, 2.5 V, 3.6 V, 4.2 V, V_{con} = 2.85 V (Note 3), P_o ≦ 27dBmW, f = 887~925 MHz, P_{in} = adjust, Z_G = 50 Ω, VSWR LOAD = 3:1 all phase		—	—	−60	dB
Receiving band noise		NRB	V_{CC1}, $V_{CC\ 2}$ = 3.6 V, V_{con} = 2.85 V (Note 2), P_o ≦ 27dBmW, f = 887~925 MHz, P_{in} = adjust, Z_G = Z_L = 50 Ω		—	−135	—	dBmW/ Hz
Load mismatch		—	V_{CC1}, $V_{CC\ 2}$ = 1.5 V~4.2 V, V_{con} = 2.85 V (Note 2), P_o ≦ 27dBmW, f = 887~925 MHz, P_{in} = adjust, Z_G = 50 Ω, VSWR LOAD = 3:1 all phase		No degradation			—

Caution: This RF power amplifier is the electrostatic sensitive device. Please handle with caution.

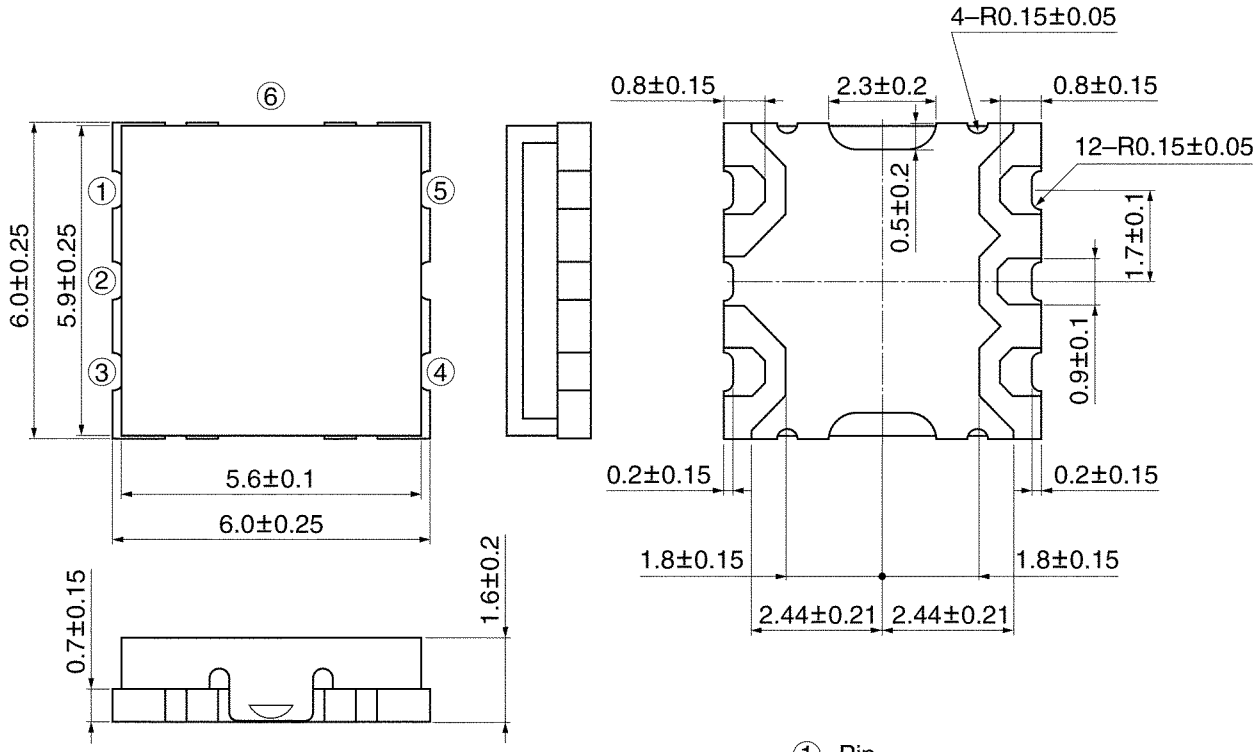
Note 2: V_{con} = 2.85 V is set to obtain Iidle ≃ 75 mA when V_{CC1}, V_{CC2} = 3.6 V

Note 3: ACPR
a) Pc (1.23 MHz) is average power measured for 1.23 MHz bandwidth with CDMA signal.
b) P (30 kHz) is average power measured for 30 kHz bandwidth with 900 kHz/1.98 MHz offset.
c) ACPR1 (or ACPR2) = P (30 kHz) − P_C (1.23 MHz) dB

Note 4: These electrical characteristics are measured using Toshiba recommended test board.

Package Dimensions

unit : mm

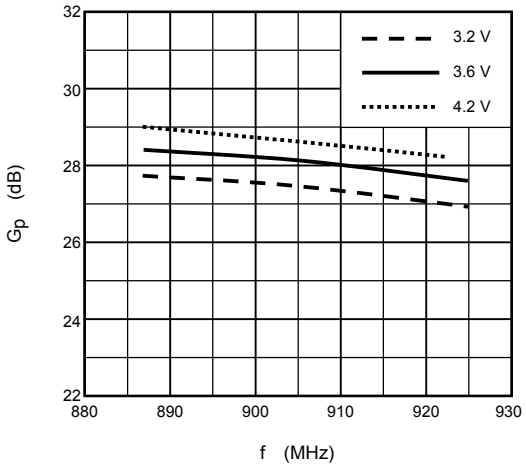


Typical Characteristic Curves

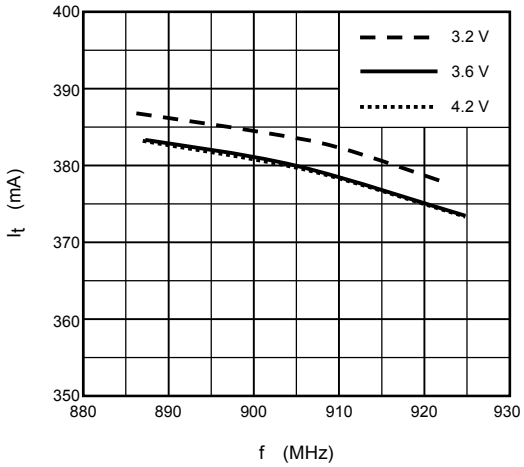
(1) Frequency Characteristics

P_O = 27dBmW, V_{con} = 2.85 V, V_{CC1}, V_{CC2} = 3.6 V

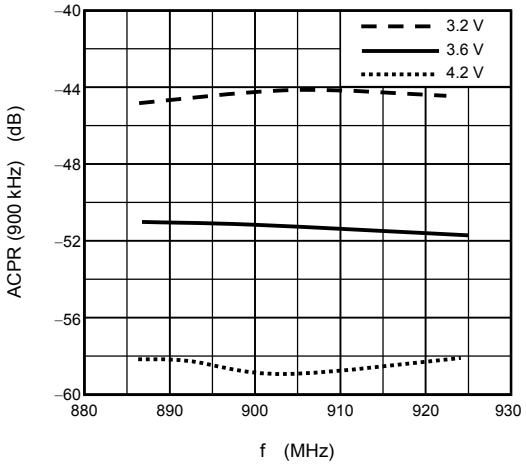
G_p – f



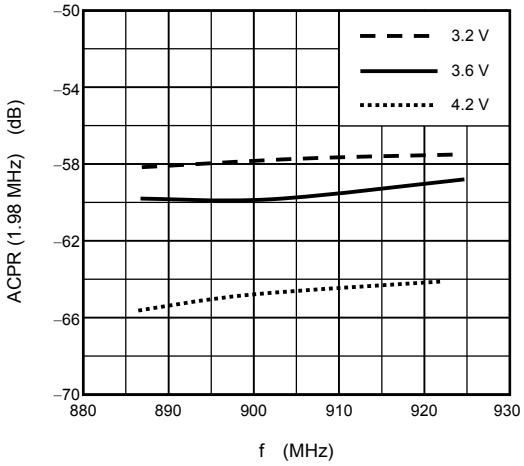
I_t – f



ACPR (900 kHz) – f

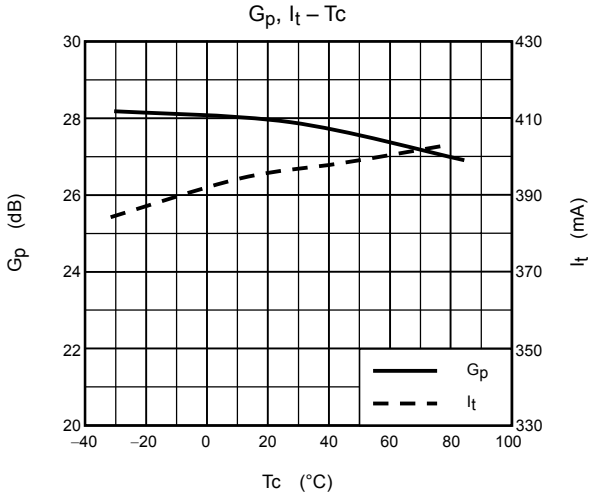


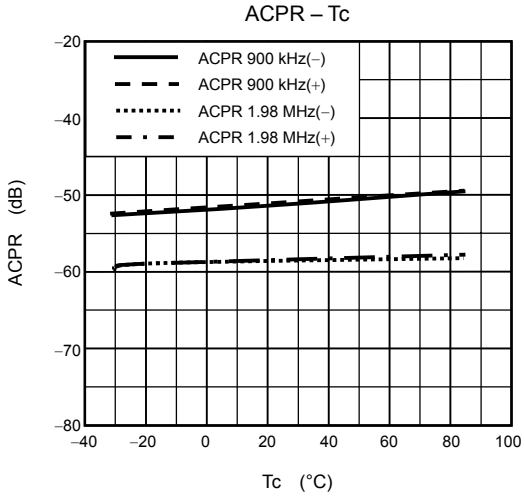
ACPR (1.98 MHz) – f



(2) Temperature Characteristics

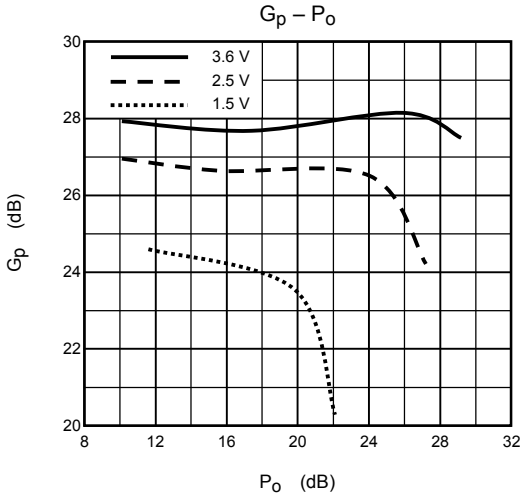
P_O = 27dBmW, V_{con} = 2.85 V, f = 906 MHz, V_{CC1}, V_{CC2} = 3.6 V

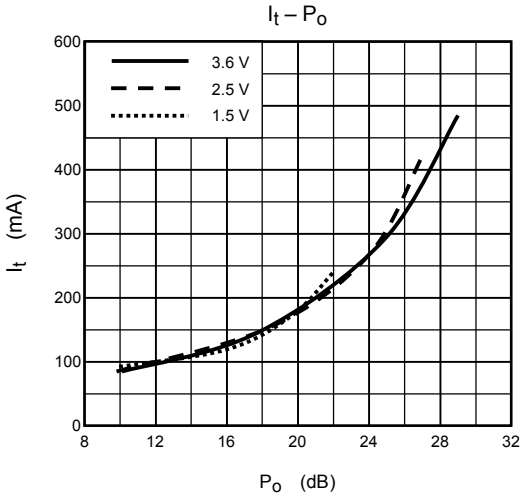


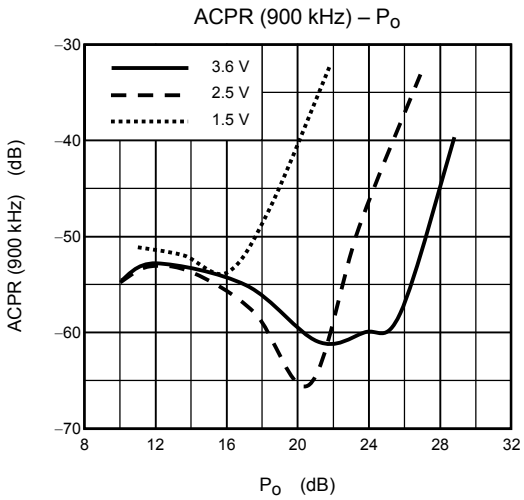


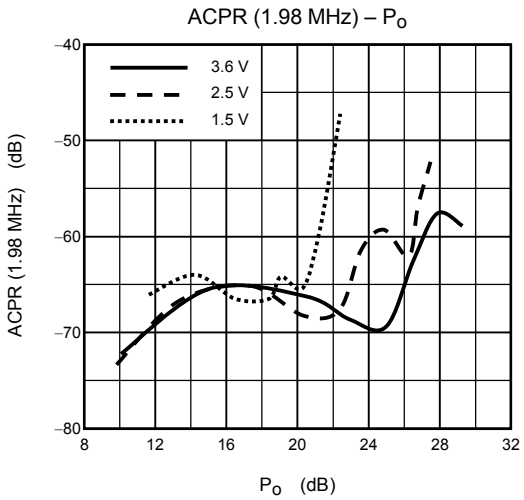
(3) Power Supply Voltage

V_{CC} Characteristics (f = 906 MHz, V_{con} = 2.85 V)



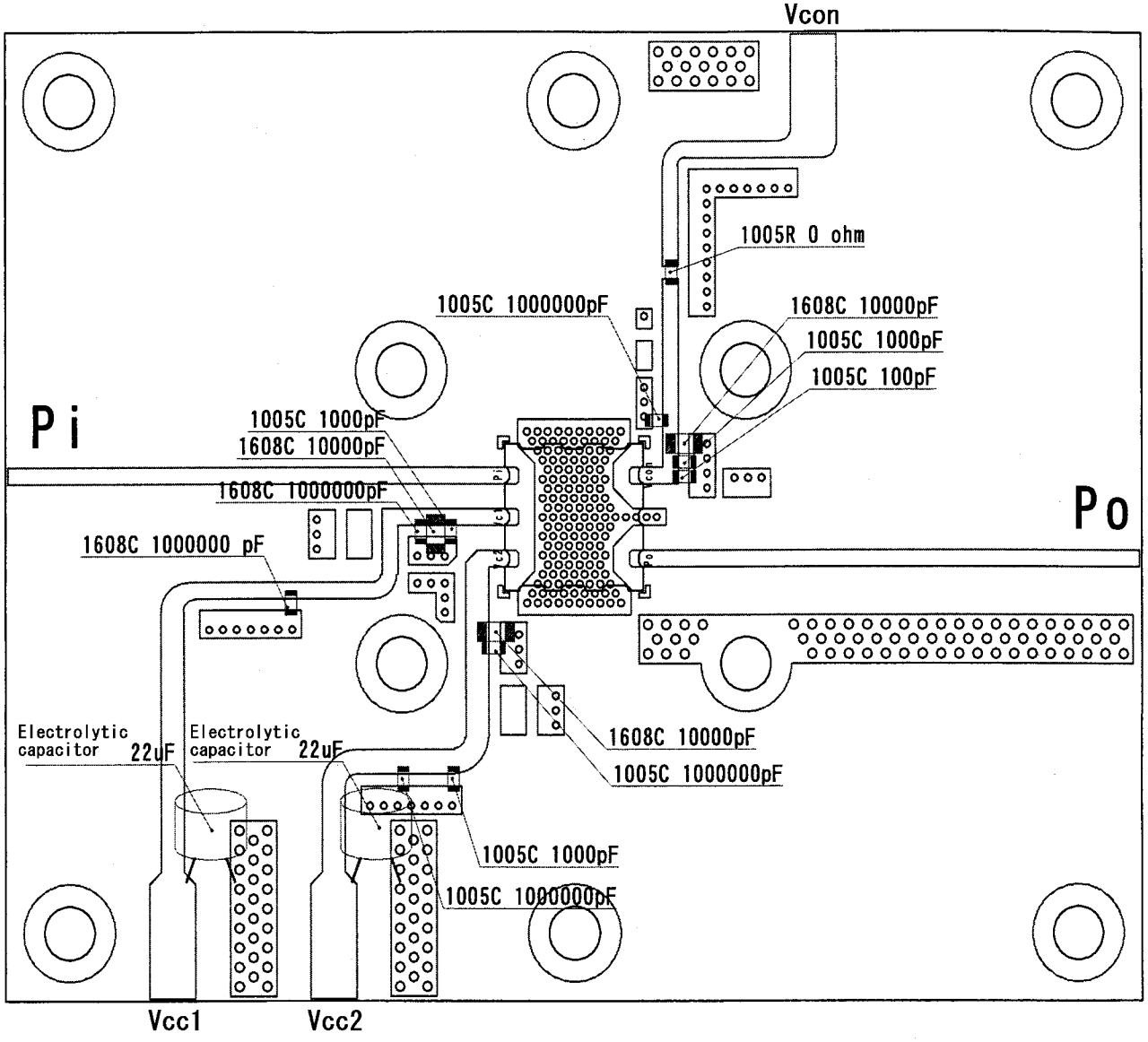






Note: These are only typical curves and devices are not necessarily guaranteed at these curves.

Test Board



Note for biasing procedure: Please follow this sequence when you measure a device bias sequence.

a) $V_{CC}1$, $V_{CC}2$ On 0 V to Supply Voltage
b) V_{con} On adjust idle current
c) RF on

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