NEC

GaAs MULTI-CHIP INTEGRATED CIRCUIT

MC-5973

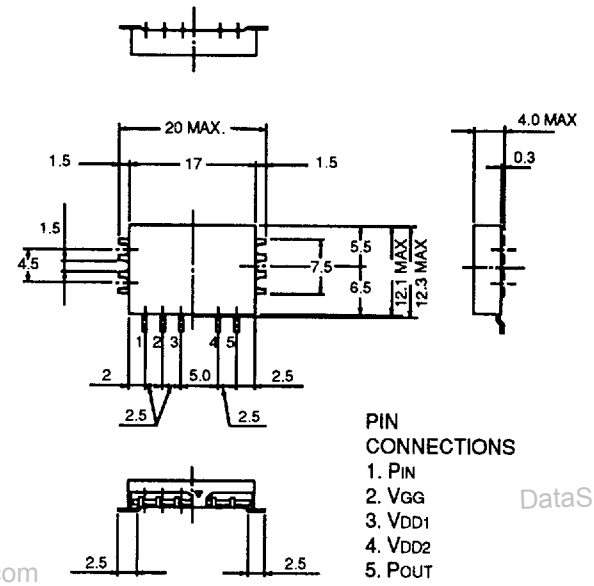
FEATURES

- **LOW DISSIPATIVE CURRENT**
  Total Current I_{DD} = 410 mA (Typ.) at P_{OUT} = 30.5 dBm
- **HIGH EFFICIENCY AND LOW VOLTAGE OPERATION:** Total Efficiency, η_T = 63% (Typ.) at P_{OUT} Maximum and V_{DD} = 4.6 V
- **SMALL SIZE**

DESCRIPTION

The MC-5973 is a two stage GaAs Multi-Chip Integrated Circuit (MCIC), designed to be used as the Power Amplifier in a cellular portable or handheld application. Its optimum frequency range of 824-849 MHz makes it ideal for cellular analog phones for use in the U.S. (AMPS). With separate access provided to both drain supplies, the output power can be effectively controlled. With over 1 Watt output power, a low 4.6 volt supply, excellent efficiency and small size, this MCIC has advantages for a variety of portable wireless applications.

OUTLINE DIMENSIONS (Units in mm)



PIN CONNECTIONS
1. P_{IN}
2. V_{GG}
3. V_{DD1}
4. V_{DD2}
5. P_{OUT}

Note:
1. Lead dimensions 0.25 x 0.5
2. Tolerance of lead pitch ±0.3

ELECTRICAL CHARACTERISTICS (T_C = 25°C)

PART NUMBER / PACKAGE OUTLINE			MC-5973		
SYMBOLS	PARAMETERS AND CONDITIONS[1]	UNITS	MIN	TYP	MAX
f	Frequency	MHz	824		849
P_{OUT1}	Output Power 1, P_{IN} = 7 dBm, V_{DD1} = V_{DD2} = 4.6 V, V_{GG} = -3.5 V	dBm	30.5	31.3	
P_{OUT2}	Output Power 2, P_{IN} = 7 dBm, V_{DD1} = V_{DD2} = 4.0 V, V_{GG} = -3.5 V	dBm		29.0	
I_{DD}[2]	Total Current, P_{IN} = 7 dBm, P_{OUT} = 30.5 dBm, $V_{DD1} \leq$ 4.6 V, V_{DD2} = 4.6 V, V_{GG} = -3.5 V	mA		410	450
2fo	Harmonics, P_{IN} = 7 dBm, P_{OUT} = 30.5 dBm, $V_{DD1} \leq$ 4.6 V, V_{DD2} = 4.6 V, V_{GG} = -3.5 V	dBc			-30
3fo	Harmonics, P_{IN} = 7 dBm, P_{OUT} = 30.5 dBm, $V_{DD1} \leq$ 4.6 V, V_{DD2} = 4.6 V, V_{GG} = -3.5 V	dBc			-30
4fo	Harmonics, P_{IN} = 7 dBm, P_{OUT} = 30.5 dBm, $V_{DD1} \leq$ 4.6 V, V_{DD2} = 4.6V, V_{GG} = -3.5 V	dBc			-30
I_{GG}	Gate Current, P_{IN} = 7 dBm, P_{OUT} = 30.5 dBm, $V_{DD1} \leq$ 4.6 V, V_{DD2} = 4.6 V, V_{GG} = -3.5 V	mA		1.0	3.0
VSWR	Input VSWR, P_{OUT} = +30.5 dBm, V_{DD} = 5.8 V				3:1
	Stability Against Load Fluctuation, P_{IN} = 7 dBm, $P_{OUT} \geq$ 30.0 dBm, V_{GG} = -3.5 V, Z_S = 50 Ω, ALL PHASE, Load Time = 30 s, V_{DD1} = V_{DD2} = 8.0 V, LOAD VSWR = 20:1		No characteristic change. Frequency, Output Power 1, 2, Total Current, Harmonics, Gate Current, Input VSWR		

Notes:
1. V_{GG} = ± 0.2 V, Z_S = Z_L = 50 Ω.
2. I_{DD} = I_{DD1} + I_{DD2}

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
$V_{DD1, 2}$	Supply Voltage 1,2[2]	V	10
V_{GG}	Supply Voltage 3	V	-6
P_{IN}	Input Power	dBm	12
$T_{C (OP)}$	Operating Case Temperature	°C	-30 to +90
T_{STG}	Storage Temperature	°C	-30 to +120

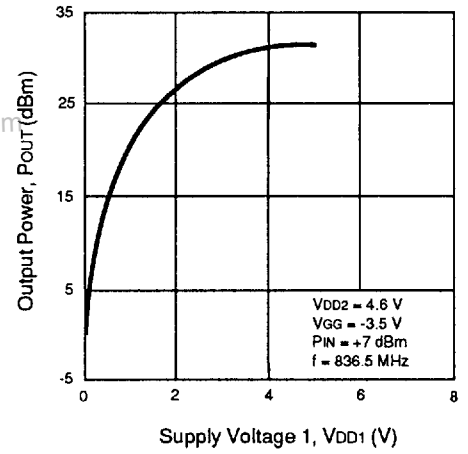
Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. V_{GG} = -4 V.

RECOMMENDED OPERATING CONDITIONS

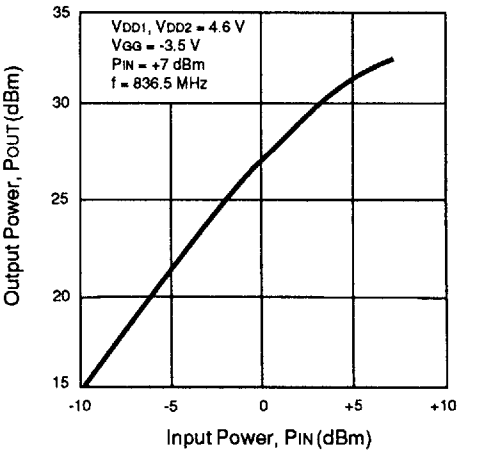
SYMBOL	PARAMETERS	UNITS	MIN	TYP	MAX
V_{DD1}	Supply Voltage 1	V		4.6	4.8
V_{DD2}	Supply Voltage 2	V	3.0	4.6	7.0
V_{GG}	Supply Voltage 3	V	-3.3	-3.5	-3.7
P_{IN}	Input Power	dBm		7	8

TYPICAL PERFORMANCE CURVES (T_A = 25°C)

OUTPUT POWER vs. SUPPLY VOLTAGE



OUTPUT POWER vs. INPUT POWER



OUTPUT POWER AND TOTAL CURRENT vs. FREQUENCY