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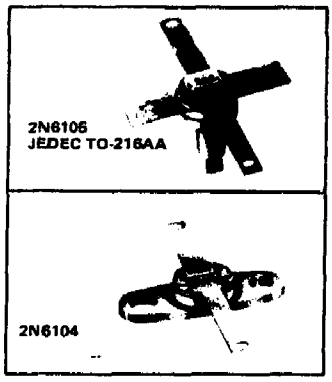
RF Power Transistors

2N6104
2N6105



30-W 400-MHz Broadband Emitter-Ballasted Silicon N-P-N Overlay Transistors

Features:

- 5-dB gain (min.) at 400 MHz with 30 watts (min.) output
- Emitter-ballasting resistors
- Broadband performance (225-400 MHz)
- Low-inductance ceramic-metal hermetic package
- Radial leads for microstripline circuits
- All electrodes isolated from the stud (2N6105)
- Flange is emitter lead (2N6104)

MAXIMUM RATINGS, *Absolute-Maximum Values:*

* COLLECTOR-TO-EMITTER VOLTAGE:			
With base open	V_{CEO}	30	V
* COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	65	V
* EMITTER-TO-BASE VOLTAGE	V_{EBO}	4	V
* CONTINUOUS COLLECTOR CURRENT	I_C	4.5	A
* TRANSISTOR DISSIPATION	P_T		
At case temperatures up to 75° C		36	W
At case temperatures above 75° C		Derate linearly at 0.288	W/°C
* TEMPERATURE RANGE:			
Storage & Operating (Junction)		− 65 to +200	°C
* CASE TEMPERATURE (During soldering):			
For 10 s max.		230	°C

* In accordance with JEDEC registration data format JS-6 RDF-3/JS-9 RDF-7.

ELECTRICAL CHARACTERISTICS, *at Case Temperature (T_C) = 25°C unless otherwise specified*

STATIC

	CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS		UNITS
			DC Voltage V		DC Current mA				
			V_{CE}	V_{BE}	I_E	I_C	MIN.	MAX.	
*	Collector-to-Emitter Cutoff Current: Base connected to emitter, T_C=55°C	I_{CES}	30	0			–	10	mA
*	Collector-to-Emitter Breakdown Voltage: With base connected to emitter	$V_{(BR)CES}$		0		200[a]	65	–	V
	With base open	$V_{(BR)CEO}$				200[a]	30	–	
*	Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$			5	0	4	–	V
	Thermal Resistance (Junction-to-Case)	$R_{\theta JC}$						3.5	°C/W

[a]Pulsed through a 25-mH inductor; duty factor = 50%.

DYNAMIC

	CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS		UNITS
			DC Collector Supply (V_{CC})-V	Input Power (P_{IE})-W	Output Power (P_{OE})-W	Frequency (f)—MHz	Min.	Max.	
	Output Power (See Fig. 10)	P_{OE}	28	9.5		400	30	–	W
	Overdrive Test (See Fig. 10)	P_{OEO}	28	12.0		400	34	—	
*	Power Gain	G_{PE}	28		30	400	5	–	dB
*	Collector Efficiency	η_C	28	9.5		400	65	-	%
*	Collector-to-Base Output Capacitance	C_{obo}	30 (V_{CB})			1	–	35	pF

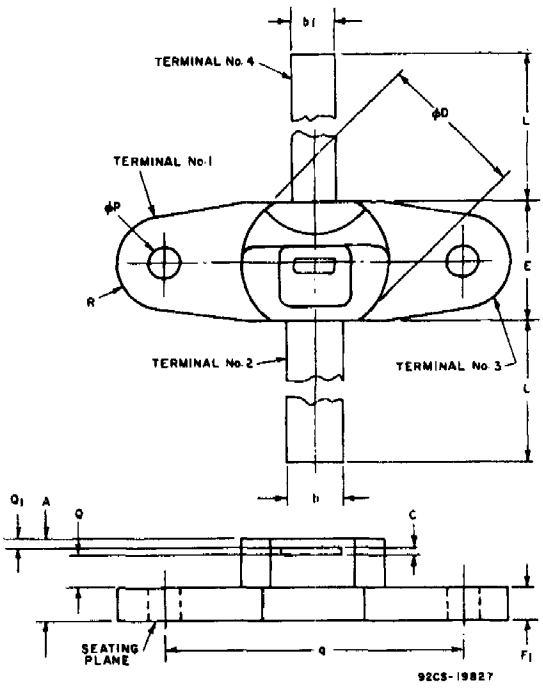
*In accordance with JEDEC registration data format JS-6 RDF-3/JS-9 RDF-7.

TYPICAL APPLICATION INFORMATION

CIRCUIT	COLLECTOR SUPPLY VOLTAGE (V_{CC})—V	OUTPUT POWER (P_{OE})—W	INPUT POWER (P_{IE})—W	COLLECTOR EFFICIENCY (η_C) – %	FIG. NO.
225-400 MHz (2N6105)▲ Broadband Amplifier	28 20	30 20	5 – 7.5 5 – 7	69 – 77 70 – 82	13 13
400 MHz (2N6104-5) Narrow-Band Amplifier	28	34	9.5	78	10
225-400 MHz (2N6105)▲ Push-Pull Amplifier	28	60	11.5 – 18	72 – 84	16

▲ Similar performance can be obtained with the 2N6104.

DIMENSIONAL OUTLINE FOR 2N6104
RCA HF-32



92CS-19827

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN	MAX.	
A	0.160	0.210	4.07	5.33	
b	0.135	0.145	3.429	3.683	
b_1	0.095	0.105	2.413	2.667	
c	0.004	0.010	0.102	0.254	1
ϕD	0.305	0.320	7.75	8.12	
E	0.275	0.300	6.99	7.62	
F_1	0.057	0.067	1.448	1.701	
L	0.455	0.510	11.56	12.95	
ϕP	0.115	0.125	2.921	3.175	
Q	0.085	0.105	2.16	2.66	
Q_1	–	–	–	–	2
q	0.590	0.610	14.99	15.49	
R	0.115	0.125	2.921	3.175	

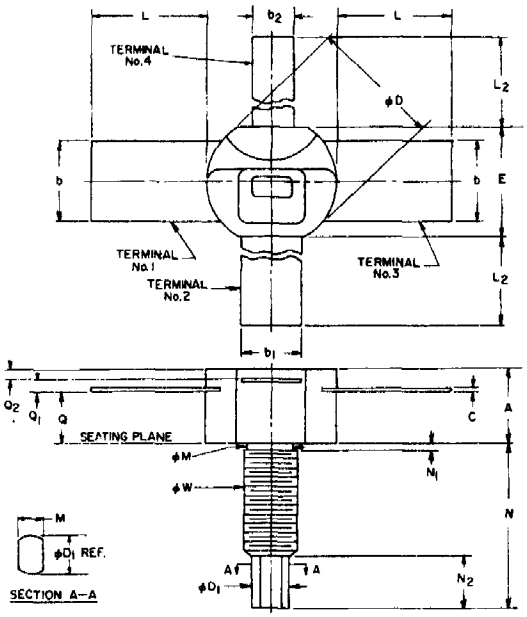
NOTES:
1. TYPICAL TWO LEADS.
2. BODY CONTOUR OPTIONAL WITHIN Q_1, ϕD, AND E.

TERMINAL CONNECTIONS

2N6104:
Flange (Terminals 1,3) – Emitter
Terminal 2 – Base
Terminal 4 – Collector

2N6105:
Terminals 1,3 – Emitter
Terminal 2 – Base
Terminal 4 – Collector

DIMENSIONAL OUTLINE FOR 2N6105
JEDEC TO-216



9255-3763R4

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.150	0.230	3.81	5.84	–
b	0.195	0.205	4.953	5.207	–
b_1	0.135	0.145	3.429	3.683	–
b_2	0.095	0.105	2.413	2.667	–
C	0.004	0.010	0.102	0.254	3
ϕD	0.305	0.320	7.75	8.12	5
$ϕD_1$	0.110	0.130	2.80	3.30	1
E	0.275	0.300	6.99	7.62	5
L	0.265	0.290	6.74	7.36	–
L_2	0.455	0.510	11.56	12.95	–
M	0.053	0.064	1.35	1.62	–
ϕM	0.120	0.163	3.05	4.14	–
N	0.425	0.470	10.80	11.93	–
N_1	–	0.078	–	1.98	4
N_2	0.110	0.150	2.80	3.81	–
Q	0.120	0.170	3.05	4.31	–
Q_1	0.025	0.045	0.64	1.14	–
Q_2	–	–	–	–	5
ϕW	–	–	–	–	2

Millimeter dimensions are derived from original inch dimensions

NOTES.
1. 0.053 - 0.064 INCH (1.35 - 1.62 mm) WRENCH FLAT.
2. PITCH DIA. OF 8-32 UNC-2A COATED THREADS (REF: UNITED SCREW THREADS ANS B1.1 - 1960). THE APPLIED TORQUE SHOULD NOT EXCEED 5 IN.-LBS. CLAMPING FORCES MUST BE APPLIED ONLY TO THE FLAT SURFACES OF THE STUD.
3. TYPICAL FOR ALL LEADS.
4. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ϕW.
5. BODY CONTOUR OPTIONAL WITHIN Q_2, ϕD, AND E.