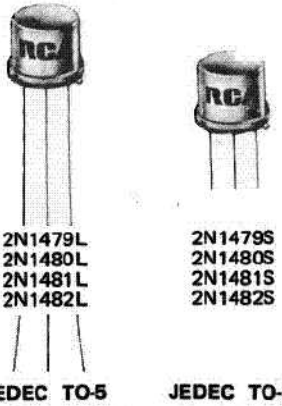
RCA
Solid State
Division

Power Transistors

2N1479 2N1480
2N1481 2N1482

File Number 135



Silicon N-P-N Power Transistors

General-Purpose Types for Medium-Power Applications

Features:

- High-temperature characterization
- High dc beta at 200 mA
- Full switching-time characterization at 200 mA

These devices are available with either 1½-inch leads (TO-5 package) or ½-inch leads (TO-39 package). The longer-lead versions are specified by suffix "L" after the type number; the shorter-lead versions are specified by suffix "S" after the type number.

RCA-2N1479–2N1482 are diffused-junction silicon n-p-n power transistors. These transistors are intended for a wide variety of applications in industrial and military equipment. They are particularly useful in power-switching circuits such as in dc-to-dc converters, inverters, choppers, solenoid and relay controls; in oscillator, regulator, and pulse-amplifier circuits; and as class A and class B push-pull audio and servo amplifiers.

These transistors feature high beta at high current, and excellent high-temperature performance. They employ the JEDEC TO-39 or TO-5 hermetic package.

Maximum Ratings, *Absolute-Maximum Values:*		2N1479 2N1481	2N1480 2N1482	
*COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	60	100	V
*COLLECTOR-TO-EMITTER VOLTAGE:				
With base open, sustaining	$V_{CEO(sus)}$	40	55	V
With emitter-to-base reverse biased (V_{EB} = 1.5 volts)	V_{CEX}	60	100	V
*EMITTER-TO-BASE VOLTAGE	V_{EB}	12	12	V
*COLLECTOR CURRENT	I_C	1.5	1.5	A
*EMITTER CURRENT	I_E	−1.75	−1.75	A
*BASE CURRENT	I_B		1	A
*TRANSISTOR DISSIPATION:	P_T			
(See Rating Chart Fig. 1):				
At case temperature of 25° C		5	5	W
At case temperature of 100° C		2.86	2.86	W
TEMPERATURE RANGE:				
Operating and Storage		−65 to +200		°C

*In accordance with JEDEC registration data

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS						LIMITS								UNITS
		VOLTAGE V dc			CURRENT mA dc			2N1479		2N1480		2N1481		2N1482		
		V_{CB}	V_{CE}	V_{EB}	I_C	I_B	I_E	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Collector Cutoff Current:	I_{CBO}	30					0		10		10		10		10	μA
T_C = 150°C		30					0		500		500		500		500	
Emitter Cutoff Current	I_{EBO}			12	0				10		10		10		10	μA
Collector-To-Emitter Voltage: With base-emitter junction reverse-biased	V_{CEX}			1.5	0.25			60		100		60		100		V
With base open, sustaining	$V_{CEO(sus)}$				50	0		40		55		40		55		
Base-To-Emitter Voltage	V_{BE}		4		200				3		3		3		3	V
DC Current Transfer Ratio	h_{FE}		4		200			20	60	20	60	35	100	35	100	
Small-Signal Current Transfer Ratio	h_{fe}		4		5			50 Typ.		50 Typ.		50 Typ.		50 Typ.		
DC Collector-To-Emitter Saturation Resistance	R_s				200 200	20 10			7		7		7		7	Ω
Collector-To-Base Capacitance	C_{ob}	40						150 Typ.		150 Typ.		150 Typ.		150 Typ.		pF
Thermal Time Constant	τ_1							10 Typ.		10 Typ.		10 Typ.		10 Typ.		ms
Alpha-Cutoff Frequency	fa_b	28			5			1.5 Typ.		1.5 Typ.		1.5 Typ.		1.5 Typ.		MHz
Switching Time:																
Delay Time	t_d*							0.2 Typ.		0.2 Typ.		0.2 Typ.		0.2 Typ.		μs
Rise Time	t_r*							1 Typ.		1 Typ.		1 Typ.		1 Typ.		
Storage Time	t_s*							0.6 Typ.		0.6 Typ.		0.6 Typ.		0.6 Typ.		
Fall Time	t_f*							1 Typ.		1 Typ.		1 Typ.		1 Typ.		
Thermal Resistance:																
Junction-to-case	$R_{\theta JC}$								35		35		35		35	°C/W
Junction-to-free air	$R_{\theta JFA}$								200		200		200		200	

*In accordance with JEDEC registration data

*I_C = 200 mA, I_{B_1} = 20 mA, I_{B_2} = −8.5 mA; see Figs. 6 and 7.

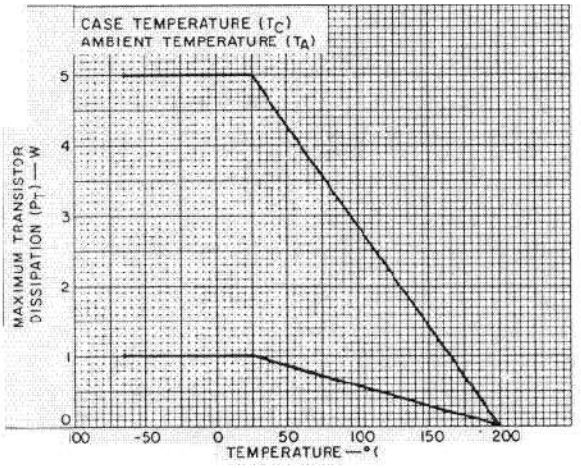


Fig. 1 – Derating chart for all types.

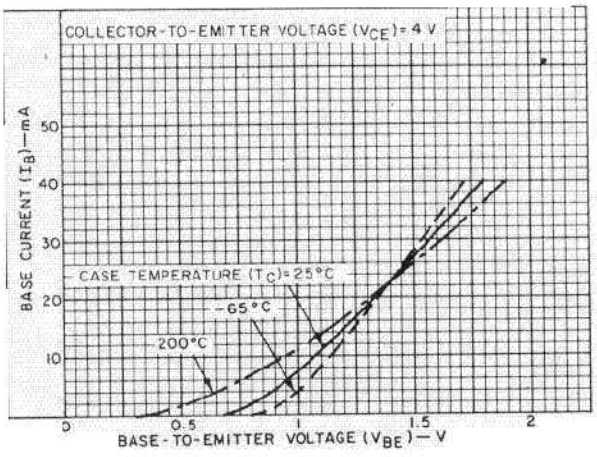


Fig.2 — Typical input characteristics for all types.

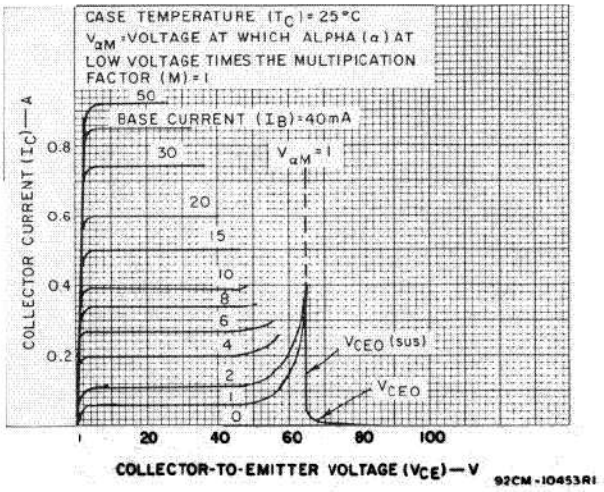


Fig.3 — Typical output characteristics for all types.

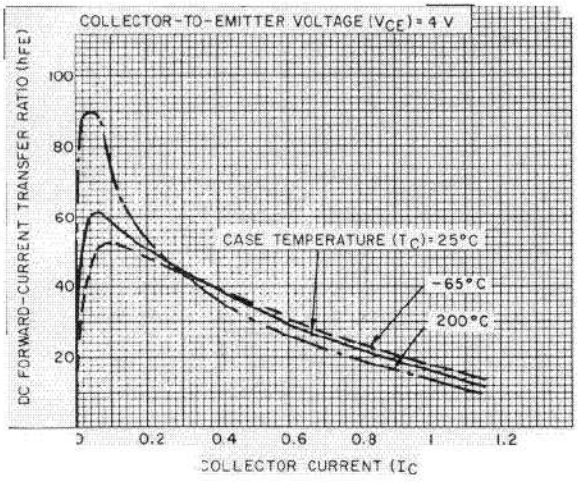


Fig.4 — Typical dc beta characteristics for all types.

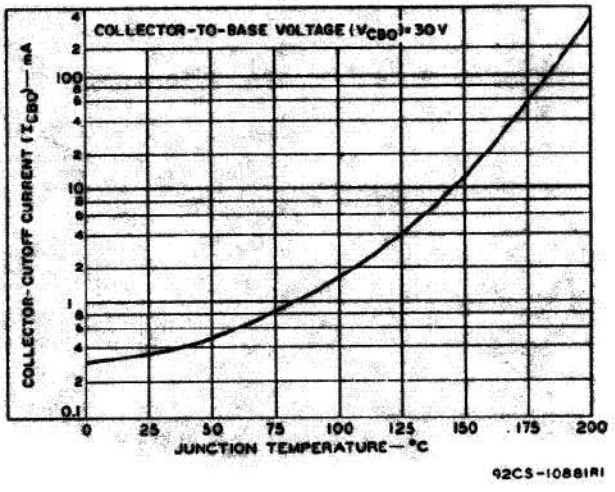


Fig.5 — Typical leakage characteristics for all types.

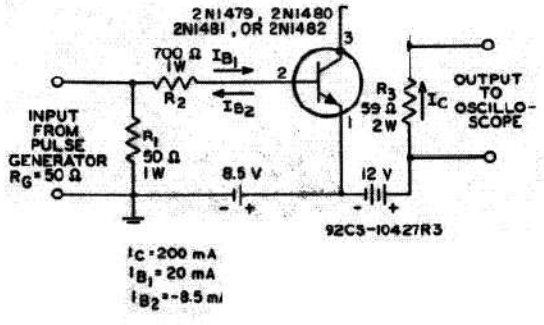


Fig.6 — Test circuit for measurement of saturated switching times.

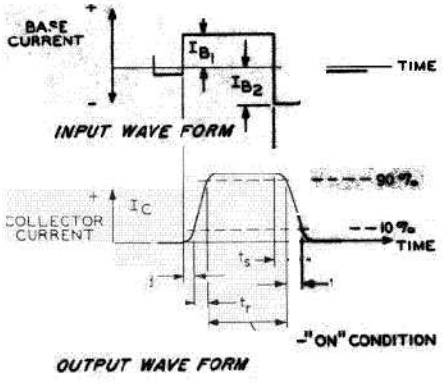
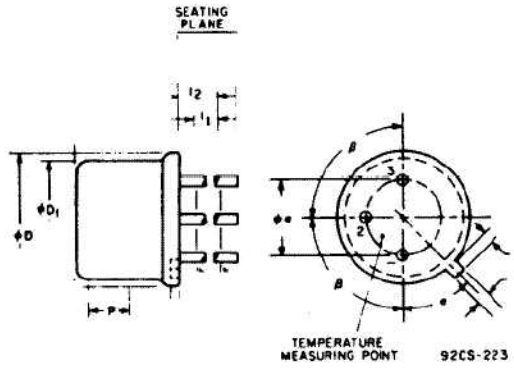


Fig. 7 — Oscilloscope display for measurement of switching times (test circuit in Fig. 6).

DIMENSIONAL OUTLINE FOR ALL TYPES



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
ϕa	0.190	0.210	4.83	5.33	
A	0.240	0.260	6.10	6.60	
ϕb	0.016	0.021	0.406	0.533	2
ϕb_2	0.016	0.019	0.406	0.483	2
ϕD	0.350	0.370	8.89	9.40	
ϕD_1	0.305	0.335	8.00	8.51	
h	0.009	0.041	0.229	1.04	
j	0.028	0.034	0.711	0.864	
k	0.029	0.040	0.737	1.02	3
L (long lead)	1.500		38.10		2
L (short lead)	0.500		12.70		2
l_1		0.050		1.27	2
l_2	0.250		6.35		2
P	0.100		2.54		1
Q					4
α	45° NOMINAL				
β	90° NOMINAL				

Note 1: This zone is controlled for automatic handling. The variation in actual diameter within this zone shall not exceed 0.010 in. (0.254 mm).

Note 2: (Three leads)ϕb_2 applies between l_1 and l_2. ϕb applies between l_2 and l. Diameter is uncontrolled in l_1.

Note 3: Measured from maximum diameter of the actual device.

Note 4: Details of outline in this zone optional.

TERMINAL CONNECTIONS

Lead 1 - Emitter
Lead 2 - Base
Case, Lead 3 - Collector

When incorporating RCA Solid State Devices in equipment, it is recommended that the designer refer to "Operating Considerations for RCA Solid State Devices", Form No. 1CE-402, available on request from RCA Solid State Division, Box 3200, Somerville, N.J. 08876.