



Power Transistors

2N2015 2N2016

RCA 2N2015 and 2N2016 are diffused-junction power transistors of the silicon n-p-n type having very high power-dissipation capabilities (150 watts). The 2N2015 and 2N2016 are particularly useful in power-switching circuits such as those employed in dc-to-dc converters, inverters, choppers, and relay-control equipment. They are also extremely useful in oscillator, regulator, and pulse-amplifier circuits, and as class A and class B push-pull amplifiers for af and servo applications.

Maximum Ratings, Absolute-Maximum Values:

	2N2015	2N2016		
COLLECTOR-TO-BASE VOLTAGE.	100	130	max.	volts
COLLECTOR-TO-EMITTER VOLTAGE:				
With base open				
(Sustaining voltage)	50	65	max.	volts
EMITTER-TO-BASE VOLTAGE.	10	10	max.	volts
COLLECTOR CURRENT.	10	10	max.	amp
EMITTER CURRENT.	-13	-13	max.	amp
BASE CURRENT.	6	6	max.	amp
TRANSISTOR DISSIPATION:*				
At case temperatures				
up to 25° C.	150	150	max.	watts
At other case				
temperatures	See Fig.1			
TEMPERATURE RANGE:				
Operating and Storage.	-65 to +200			°C
LEAD TEMPERATURE,				
1/16" ± 1/32" from case,				
for immersion in molten				
solder for 10 sec. max.	235	235	max.	°C

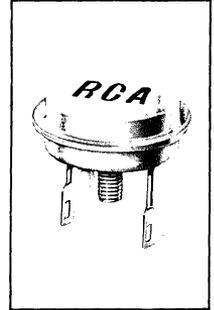
Typical Characteristics of 2N2015 and 2N2016 at a Case Temperature^c of 25° C:

Collector-to-Base Capacitance, C _{ob} :	
(V _{CB} = 40 volts)	400 μf
Thermal Time Constant, τ ₁ .	30 msec
Forward Current-Transfer-Ratio	
Cutoff Frequency, f _{αc} .	25 Kc

TERMINAL CONNECTIONS

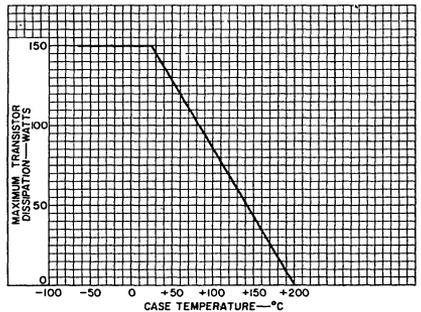
- Lead 1 - Emitter
- Lead 2 - Collector, Case
- Lead 3 - Base

High-Power Types for Military and Industrial Applications



JEDEC TO-36

- for operation at high junction temperatures - up to 200° C
- very high dissipation rating - 150 watts
- very low thermal resistance, junction-to-case - 1.17° C/Watt
- very low saturation resistance - 0.25 ohm max. at I_C = 5 amp, I_B = 0.5 amp
- JEDEC TO-36 single-ended stud-type package with cold-weld hermetic seals



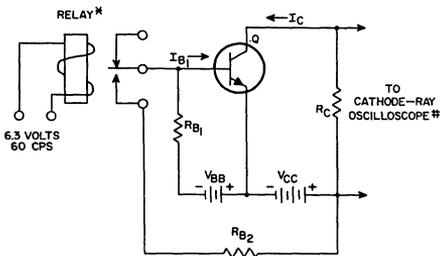
92CS-11089

Fig. 1 - Rating Chart for Types 2N2015 and 2N2016.

ELECTRICAL CHARACTERISTICS

Case temperature = 25° C unless otherwise specified.

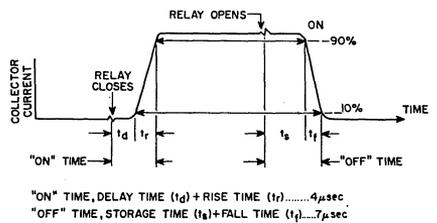
Characteristic	Symbol	TEST CONDITIONS					LIMITS				Units
		DC Collector-to-Base Voltage	DC Collector-to-Emitter Voltage	DC Emitter-to-Base Voltage	DC Collector Current	DC Base Current	Type 2N2015		Type 2N2016		
		V_{CB}	V_{CE}	V_{EB}	I_C	I_B	Min.	Max.	Min.	Max.	
Collector-Cutoff Current ($I_{E=0}$) at case temperature of: 25° C 150° C	I_{CBO}	30 30					-	50	-	50	μA mA
Emitter-Cutoff Current	I_{EBO}			10			-	50	-	50	μA
DC Forward-Current Transfer Ratio	h_{FE}		4 4		5 10		15 7.5	50 -	15 7.5	50 -	
Collector-to-Emitter Saturation Resistance	R_s				5	0.5	-	0.25	-	0.25	ohm
Base-to-Emitter Voltage	V_{BE}		4		5		-	2.2	-	2.2	volts
Collector-to-Emitter Voltage: Sustaining voltage with base open	V_{CE0} (sus)				0.2	0	-	50	-	65	volts
With reverse bias between emitter and base	V_{CEX}			1.5	2 mA		-	100	-	130	volts
Thermal Resistance Junction-to-case	R_T						-	1.17	-	1.17	°C/W



*C.R. CLARE TYPE HGP-1028 OR EQUIVALENT

‡TEKTRONIX TYPE 545 OR EQUIVALENT

- Collector Supply Voltage (V_{CC}) 24 volts
- DC Base Bias Voltage (V_{BB}) 6 volts
- *On* DC Collector Current 10 amperes
- *Turn-On* Base Current (I_{B1}) 2 amperes



ON TIME, DELAY TIME (t_d) + RISE TIME (t_r) 4 μ sec
 OFF TIME, STORAGE TIME (t_s) + FALL TIME (t_f) 7 μ sec

- Base Resistance (R_{B1}) 10 ohms
- Base Resistance (R_{B2}) 10 ohms
- Collector Resistance (R_C) 2 ohms
- Switching Time:
 On Time
 [Delay time (t_d) + Rise time (t_r)] 4 μ sec
 Off Time
 [Storage time (t_s) + Fall time (t_f)] 7 μ sec

Fig. 2—Pulse-Response Test Circuit for Types 2N2015 and 2N2016.

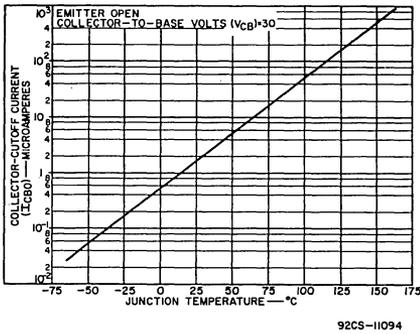


Fig. 3—Typical Operation Characteristic for Types 2N2015 and 2N2016.

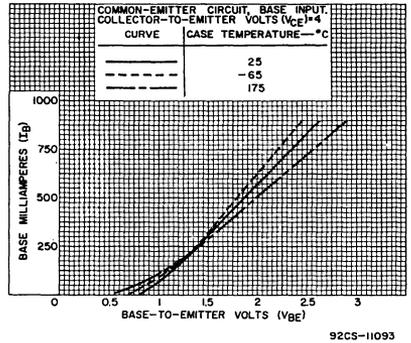


Fig. 5—Typical Input Characteristics for Types 2N2015 and 2N2016.

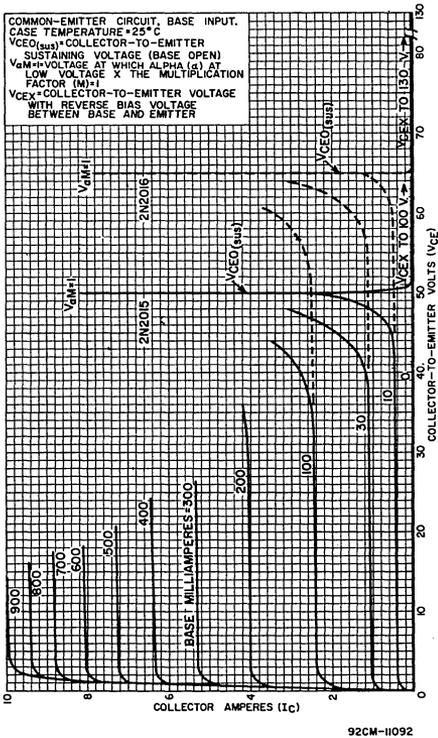


Fig. 4—Typical Collector Characteristics for Types 2N2015 and 2N2016.

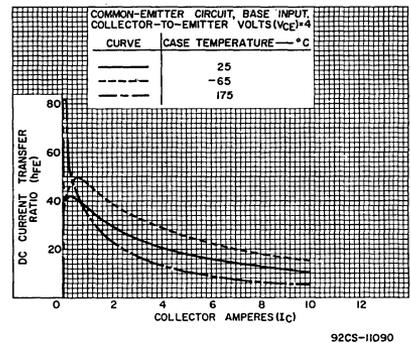


Fig. 6—Typical Operation Characteristics for Types 2N2015 and 2N2016.

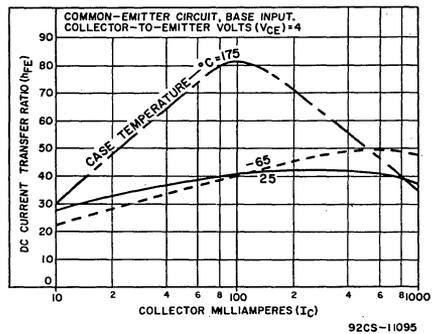


Fig. 7—Typical Operation Characteristics for Types 2N2015 and 2N2016.