Silicon NPN Transistor

2N2015

High Power Transistor

100V / 10A

DATASHEET

OEM –RCA

Source: RCA Databook 1975

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 μμf
Thermal Time Constant, τ_1.	30 msec
Forward Current-Transfer-Ratio Cutoff Frequency, $f_{\alpha e}$	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

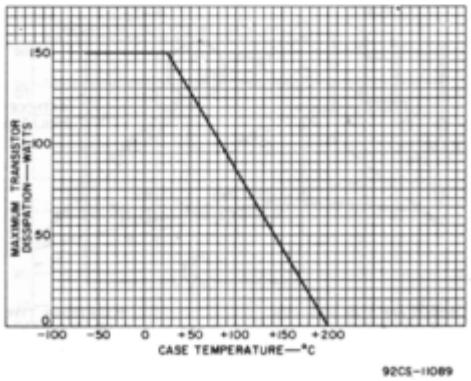
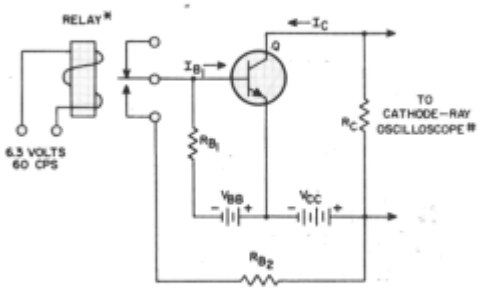


Fig. 1 - Rating Chart for Types 2N2015 and 2N2016.

ELECTRICAL CHARACTERISTICS

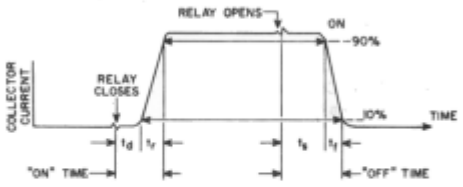
Case temperature = 25° C unless otherwise specified.

Characteristic	Symbol	TEST CONDITIONS					LIMITS				Units
		DC Collector-to-Base Voltage V_{CB}	DC Collector-to-Emitter Voltage V_{CE}	DC Emitter-to-Base Voltage V_{EB}	DC Collector Current I_C	DC Base Current I_B	Type 2N2015		Type 2N2016		
		Volts	Volts	Volts	Amperes	Amperes	Min.	Max.	Min.	Max.	
Collector-Cutoff Current ($I_E=0$) at case temperature of: 25° C	I_{CBO}	30					-	50	-	50	μA
150° C		30					-	2	-	2	mA
Emitter-Cutoff Current	I_{EBO}			10			-	50	-	50	μA
DC Forward-Current Transfer Ratio	h_{FE}		4		5		15	50	15	50	
			4		10		7.5	-	7.5	-	
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_{CEO} (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.P. CLARE TYPE HGP-1028 OR EQUIVALENT

#TEKTRONIX TYPE 545 OR EQUIVALENT



"ON" TIME, DELAY TIME (t_d) + RISE TIME (t_r).....4 μsec
"OFF" TIME, STORAGE TIME (t_s) + FALL TIME (t_f)....7 μsec

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_{B_1})	2	amperes
Base Resistance (R_{B_1})	10	ohms
Base Resistance (R_{B_2})	10	ohms
Collector Resistance (R_C)	2	ohms
Switching Time:		
"On" Time [Delay time (t_d) + Rise time (t_r)]	4	μsec
"Off" Time [Storage time (t_s) + Fall time (t_f)]	7	μsec

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

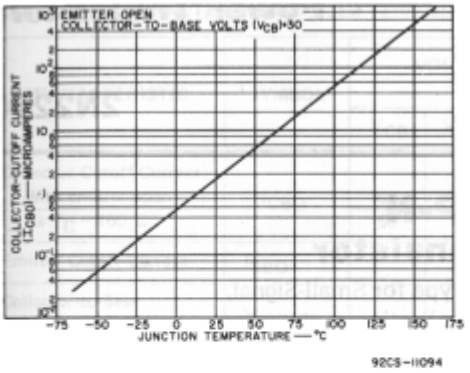


Fig. 3 - Typical Operation Characteristic for Types 2N2015 and 2N2016.

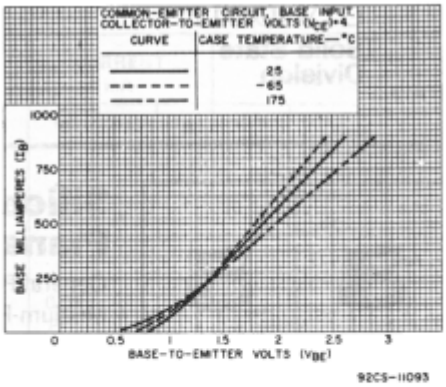


Fig. 5 - Typical Input Characteristics for Types 2N2015 and 2N2016.

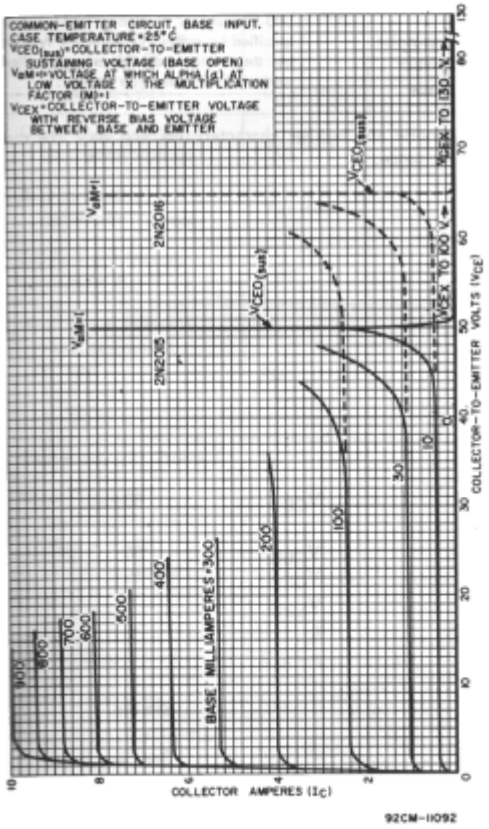


Fig. 4 - Typical Collector Characteristics for Types 2N2015 and 2N2016.

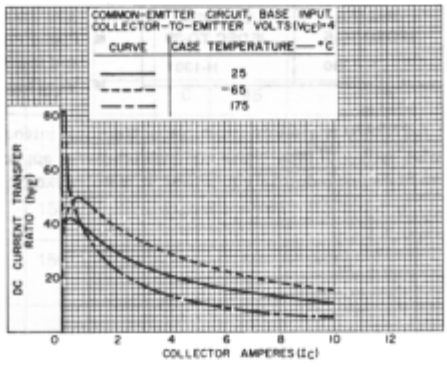


Fig. 6 - Typical Operation Characteristics for Types 2N2015 and 2N2016.

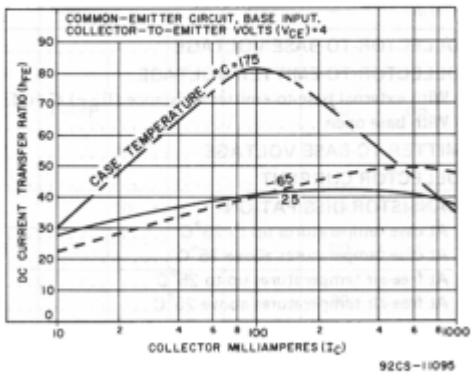


Fig. 7 - Typical Operation Characteristics for Types 2N2015 and 2N2016.