

P N P ALLOY JUNCTION GERMANIUM POWER TRANSISTORS



Choice of 40V, 60V or 80V Devices
Specifically designed for higher power output applications
Linear transconductance characteristics • High gain
Low distortion • Low saturation resistance
Low switching time • Thermal stability



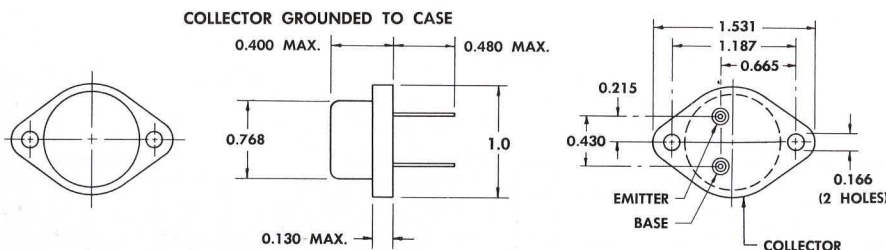
TYPES 2N456, 2N457, 2N458
 BULLETIN NO. DL-S 909 MARCH, 1958
 REPLACES BULLETIN NO. DL-S 824

qualification testing

To assure maximum reliability, stability and long life, all units are heat cycled from -55°C and room humidity to $+75^{\circ}\text{C}$ and 95% relative humidity for four complete cycles over an eight-hour period. All transistors are thoroughly tested for rigid adherence to specified design characteristics.

mechanical data

The welded case is hermetically sealed with glass-to-metal seals between the mounting base and the leads. The mounting base material is high conductivity copper providing an excellent path for heat flow to a heat sink which must be provided to permit operation at maximum rated dissipation. The collector is electrically attached to the mounting base. The approximate weight of the unit is 20 grams.



maximum ratings at 25° C*

		2N456	2N457	2N458	unit
V_{CBO}	Collector to Base ($I_C = -2.0\text{mA}$)	-40	-60	-80	V
V_{CEX}	Collector to Emitter ($V_{BE} = +0.2\text{V}$, $I_C = -2.0\text{mA}$)	-40	-60	-80	V
V_{EBO}	Emitter to Base ($I_E = -2.0\text{mA}$)	-20	-20	-20	V
	Total Dissipation†	50	50	50	W
I_C	Collector Current	5	5	5	A
I_B	Base Current	3	3	3	A
T_j	Junction Temperature	95	95	95	$^{\circ}\text{C}$

typical characteristics at 25° C*

		2N456	2N457	2N458	unit
BV_{CBO}	Collector to Base Breakdown Voltage ($I_C = -10\text{mA}$, $I_E = 0$)	-60V	-80	-100	V
h_{FE}	Forward Current Transfer Ratio ($I_C = -1.0\text{A}$, $V_{CE} = -1.5\text{V}$) ($I_C = -5.0\text{A}$, $V_{CE} = -1.5\text{V}$)	130 30	130 30	130 30	—
R_{CS}	Common-Emitter Saturation Resistance ($I_C = -5.0\text{A}$, $I_B = -1.0\text{A}$)	0.048	0.048	0.048	Ohm
	Thermal Resistance from Collector Junction to Mounting Base	1.1	1.1	1.1	$^{\circ}\text{C/W}$

* Temperature is measured on mounting base.
 † For operation at higher temperatures refer to the Derating Curve.

LICENSED UNDER BELL SYSTEM PATENTS

SEMICONDUCTOR-COMPONENTS DIVISION

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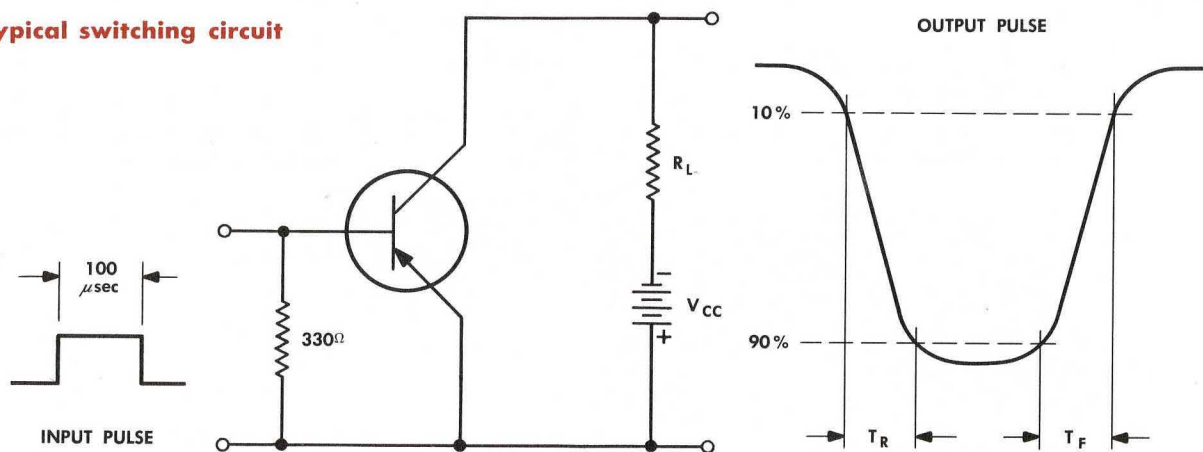
TYPES 2N456, 2N457, 2N458

TYPICAL CHARACTERISTICS AND APPLICATIONS NOTES

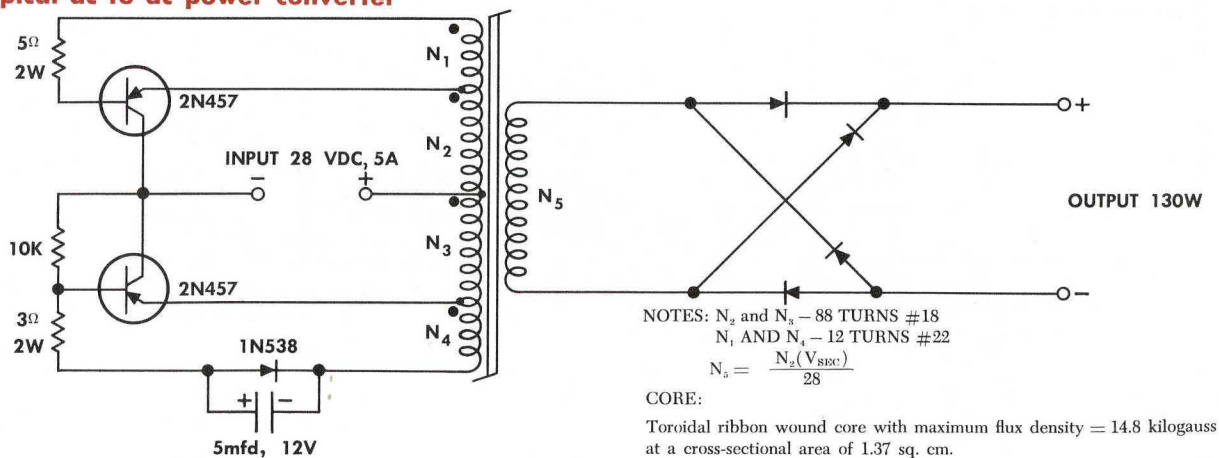
typical switching characteristics at 25°C case temperature (in circuit shown below)

V_{CC}	Source Voltage	-12	-28	V
R_L	Load Resistance	2.2	5.4	Ohm
I_C	"ON" Collector Current	-5	-5	A
P_d	"ON" Device Dissipation	5	5	W
P_{out}	"ON" Load Dissipation	55	135	W
P_{in}	Drive Power	0.14	0.14	W
P_G	Power Gain	26	30	db
T_R	Rise Time	26	26	μ sec
T_F	Fall Time	80	80	μ sec

typical switching circuit

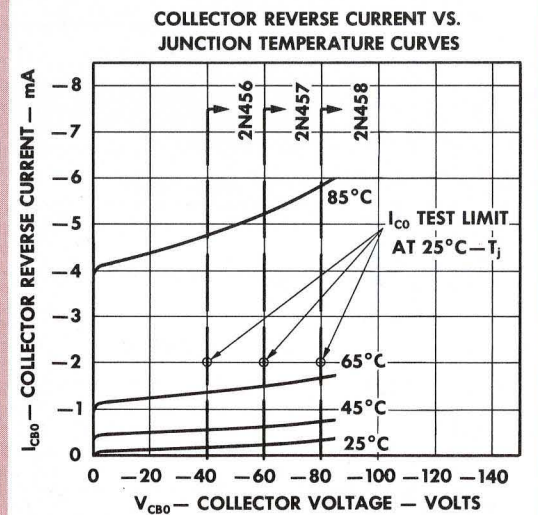
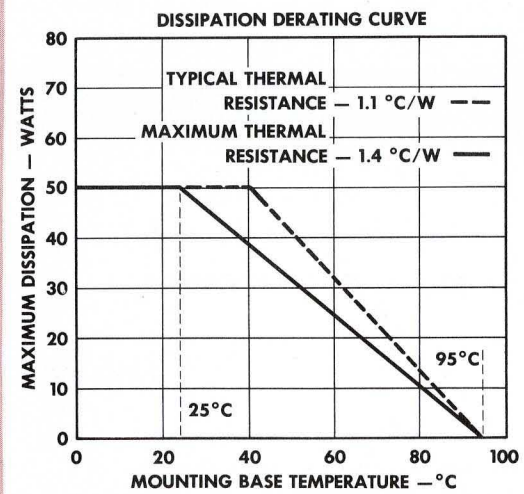
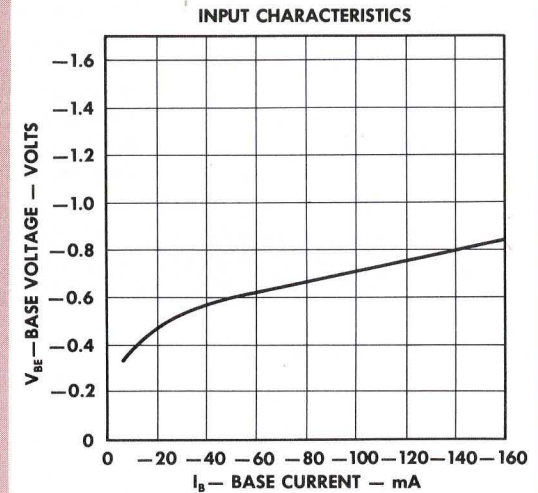
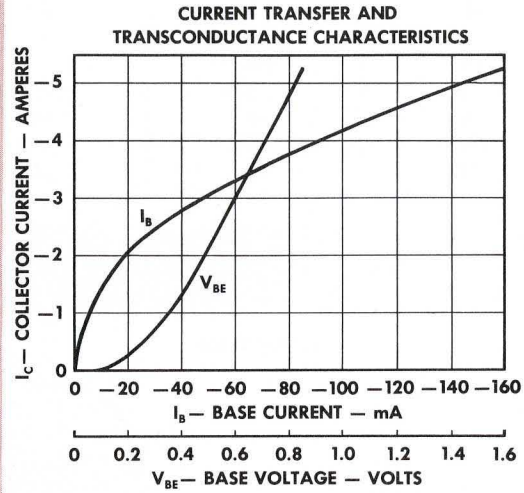


typical dc to dc power converter



TYPES 2N456, 2N457, 2N458

TYPICAL CHARACTERISTICS



TYPES 2N456, 2N457, 2N458

TYPICAL CHARACTERISTICS

design characteristics at 25° C

type	symbol	test conditions	design center	max.	unit
2N456	I_{CB0}	Collector Reverse Current ($V_{CB} = -40V, I_E = 0$)	-0.2	-2.0	mA
		($V_{CB} = -20V, I_E = 0$)	-0.15	-0.5	mA
2N457	I_{CB0}	Collector Reverse Current ($V_{CB} = -60V, I_E = 0$)	-0.6	-2.0	mA
		($V_{CB} = -30V, I_E = 0$)	-0.20	-0.5	mA
2N458	I_{CB0}	Collector Reverse Current ($V_{CB} = -80V, I_E = 0$)	-1.0	-2.0	mA
		($V_{CB} = -40V, I_E = 0$)	-0.25	-0.5	mA
All Types	I_{EB0}	Emitter Reverse Current ($V_{EB} = -20V, I_C = 0$)	-0.04	-2.0	mA
All Types	I_B	Base Current ($V_{CE} = -1.5V, I_C = -1.0A$)	-8.0	—	mA
		($V_{CE} = -1.5V, I_C = -5.0A$)	-170	-500	mA
All Types	V_{BE}	Base Voltage ($V_{CE} = -1.5V, I_C = -1.0A$)	-0.35	—	V
		($V_{CE} = -1.5V, I_C = -5.0A$)	-1.3	-3.0	V
All Types	$V_{CE}(Sat)$	$I_C = -5.0A, I_B = -1.0A$	-2.4	-1.0	V

TYPICAL CHARACTERISTICS — COMMON-EMITTER

