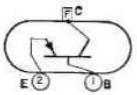
POWER TRANSISTOR

2N2147

Germanium p-n-p type used in high-fidelity amplifiers and other af amplifiers where wide frequency range and low distortion are required. It is intended primarily for class B amplifier service. JEDEC No. TO-3 package; outline 5, Outlines Section.

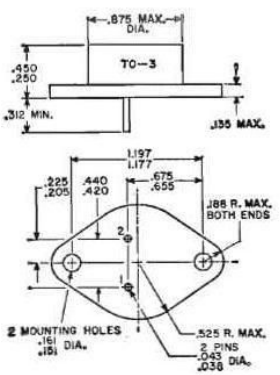


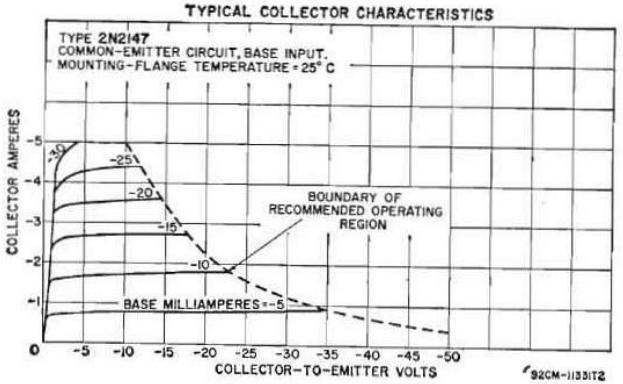
MAXIMUM RATINGS

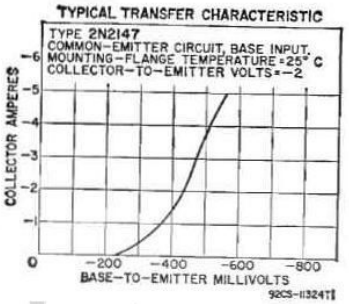
Collector-to-Base Voltage	−75 max	volts
Collector-to-Emitter Voltage	−50 max	volts
Emitter-to-Base Voltage	−1.5 max	volts
Collector Current	−5 max	amperes
Base Current	−1 max	ampere
Emitter Current	5 max	amperes
Transistor Dissipation:		
At mounting-flange temperatures up to 81°C	12.5 max	watts
At mounting-flange temperatures above 81°C	Derate 0.66	watt/°C
Temperature Range:		
Operating (junction) and Storage	−65 to 100	°C
Lead Temperature (for 10 seconds maximum)	255 max	°C

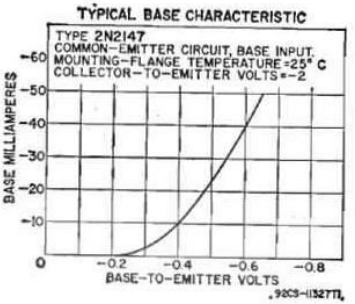
CHARACTERISTICS

Collector-to-Base Breakdown Voltage (with collector ma = −10 and emitter current = 0)	−75 min	volts
Collector-to-Emitter Breakdown Voltage (with collector ma = −100 and base current = 0)	−50 min	volts
Base-to-Emitter Voltage (with collector-to-emitter volts = −10 and collector ma = −50)	−0.24	volt
Collector-Cutoff Current (with collector-to-base volts = −40 and emitter current = 0)	−1 max	ma
Collector-Cutoff Saturation Current (with collector-to-base volt = −0.5 and emitter current = 0)	−70 max	μa
Emitter-Cutoff Current (with emitter-to-base volts = −1.5 and collector current = 0)	−2.5 max	ma
Thermal Resistance:		
Junction-to-case	1.5 max	°C/watt
In Common-Emitter Circuit		
DC Forward Current-Transfer Ratio (with collector-to-emitter volts = −1 and collector ma = −1000)	150	
Gain-Bandwidth Product (with collector-to-emitter volts = −5 and collector ma = −500)	4	Mc



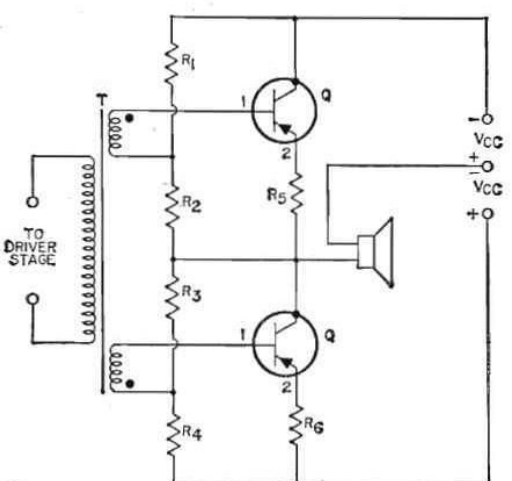






TYPICAL OPERATION IN SINGLE-ENDED PUSH-PULL AMPLIFIER CIRCUIT

DC Collector Supply Voltage	22	volts
Zero-Signal DC Collector Current	−0.05	ampere
Zero-Signal Base-Bias Voltage	−0.24	volt
Peak Collector Current	−3.5	amperes
Maximum-Signal DC Collector Current	−1.1	amperes
Input Impedance of Stage (per base)	75	ohms
Load Impedance (Speaker Voice Coil)	4	ohms
Power Gain	33	db
Maximum-Signal Power Output	25	watts
Total Harmonic Distortion at Maximum Signal Power Output	5	per cent
Maximum Collector Dissipation (per transistor) under worst-case conditions	12.5	watts
EIA Music Power Output Rating	45	watts



V_{cc} = 22 volts
R_1, R_5 = 330 ohms, 2 watts
R_2, R_4 = 3.9 ohms, 0.5 watt
R_3, R_6 = 0.27 ohm, 0.5 watt
Voice coil
impedance = 4 ohms