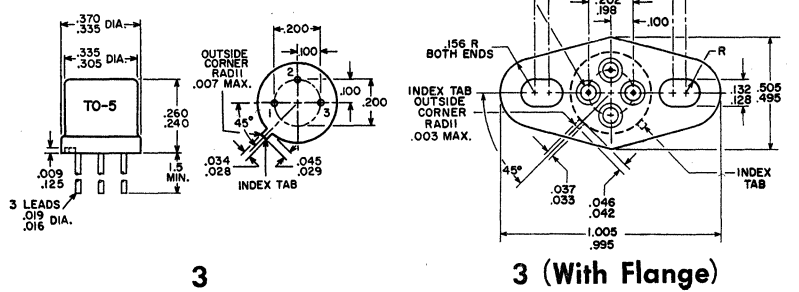
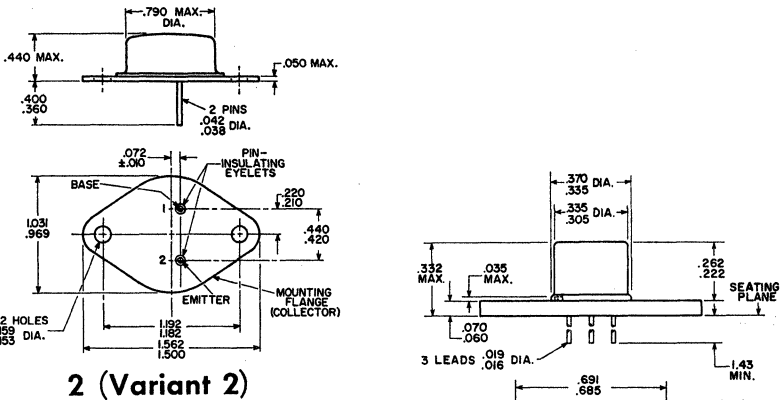
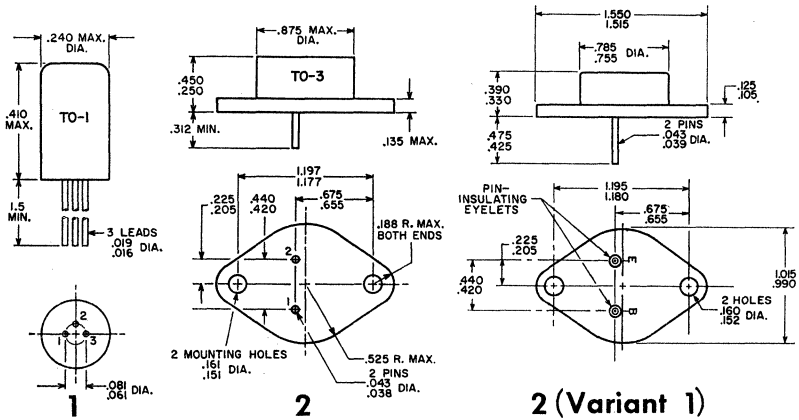


Outlines



CHARACTERISTICS (cont'd)

Base-to-Emitter Voltage ($I_C = 20$ mA, $I_B = 1$ mA)	V_{BE}	0.45 max	V
Collector-Cutoff Current:			
$V_{CB} = 0.25$ V, $I_E = 0$	I_{CBO}	6 max	μ A
$V_{CB} = 12$ V, $I_E = 0$	I_{CBO}	8 max	μ A
Emitter-Cutoff Current ($V_{EB} = 5$ V, $I_C = 0$)	I_{EBO}	5 max	μ A
Static Forward-Current Transfer Ratio ($V_{CE} = 0.2$ V, $I_C = 20$ mA)	h_{FE}	20 min	
Small-Signal Forward-Current Transfer Ratio Cutoff Frequency ($V_{CB} = 6$ V, $I_E = -1$ mA)	f_{hfb}	3 min	Mc/s
Output Capacitance ($V_{CB} = 6$ V, $I_E = 0$)	C_{ob0}	25 max	pF
Stored Base Charge ($I_C = 20$ mA, $I_B = 2$ mA)	Q_S	3000 max	μ C

2N586**TRANSISTOR**

Ge p-n-p alloy-junction type used in low-speed switching applications in industrial and military equipment. It can also be used in large-signal class A and class B push-pull af amplifiers. Similar to JEDEC TO-7 (3-lead type), Outline No.4. Terminals: 1 - emitter, 2 - base, 3 - no connection, 4 - collector.

MAXIMUM RATINGS

Collector-to-Base Voltage	V_{CBO}	-45	V
Emitter-to-Base Voltage	V_{EBO}	-12	V
Collector Current	I_C	-250	mA
Emitter Current	I_E	250	mA
Transistor Dissipation:			
$T_A = 25^\circ\text{C}$	P_T	250	mW
$T_A = 55^\circ\text{C}$	P_T	125	mW
$T_A = 71^\circ\text{C}$	P_T	60	mW
Ambient-Temperature Range:			
Operating (T_A) and Storage (T_{STG})		-65 to 85	$^\circ\text{C}$

CHARACTERISTICS

Collector-to-Emitter Breakdown Voltage:			
$I_C = -50$ μ A, $R_{BE} = 0$	$V_{(BR)CES}$	-45 min	V
$I_C = -1$ mA, $I_B = 0$	$V_{(BR)CEO}$	-25 min	V
Collector-to-Emitter Reach-Through Voltage	V_{RT}	-45 min	V
Collector-to-Emitter Saturation Voltage ($I_C = -250$ mA, $I_B = -25$ mA)	$V_{CE}(\text{sat})$	-0.5 max	V
Base-to-Emitter Voltage ($I_C = -250$ mA, $I_B = -7$ mA)	V_{BE}	-1 max	V
Collector-Cutoff Current ($V_{CB} = -45$ V, $I_E = 0$)	I_{CBO}	-16 max	μ A
Emitter-Cutoff Current ($V_{EB} = -12$ V, $I_C = 0$)	I_{EBO}	-12 max	μ A
Static Forward-Current Transfer Ratio ($V_{CE} = -0.5$ V, $I_C = -250$ mA)	h_{FE}	35 min	

2N591**TRANSISTOR**

Ge p-n-p alloy-junction type used in large-signal af driver applications in class A stages of automobile radio receivers. JEDEC TO-1, Outline No.1. Terminals: 1 - emitter, 2 - base, 3 - collector.

MAXIMUM RATINGS

Collector-to-Emitter Voltage	V_{CEO}	-32	V
Collector Current	I_C	-40	mA
Emitter Current	I_E	40	mA
Transistor Dissipation:			
T_A up to 55°C	With Heat Sink	100	mW
$T_A = 71^\circ\text{C}$	Without Heat Sink	50	mW
Temperature Range:			
Operating (Ambient)	$T_A(\text{opr})$	-65 to 71	$^\circ\text{C}$
Storage	T_{STG}	-65 to 85	$^\circ\text{C}$

CHARACTERISTICS

Collector-Cutoff Current ($V_{CB} = -1$ V, $I_E = 0$)	I_{CBO}	-7 max	μ A
Emitter-Cutoff Current ($V_{EB} = -1$ V, $I_C = 0$)	I_{EBO}	-20 max	μ A
Static Forward-Current Transfer Ratio ($V_{CE} = -12$ V, $I_E = 2$ mA)	h_{FE}	70	

CHARACTERISTICS (cont'd)

Small-Signal Forward-Current Transfer-Ratio Cutoff Frequency ($V_{CE} = -12$ V, $I_E = 2$ mA)	f_{hrb}	0.7	Mc/s
Thermal Resistance:			
Junction-to-ambient	θ_{J-A}	340 max	$^{\circ}\text{C/W}$
With heat sink		150 max	$^{\circ}\text{C/W}$

TYPICAL OPERATION IN CLASS A AF DRIVER-AMPLIFIER CIRCUIT

DC Collector-Supply Voltage	V_{CC}	-14.4	V
DC Collector-to-Emitter Voltage	V_{CE}	-12	V
DC Base-to-Emitter Voltage	V_{BE}	-0.13	V
DC Collector Current	I_C	-2	mA
Input Resistance	R_S	1000	Ω
Output Resistance	R_L	10000	Ω
Signal Frequency		1	kc/s
Power Gain		41	dB
Total Harmonic Distortion		3	%
Transistor Dissipation		25	mW
Power Output	P_{OE}	5	mW

TRANSISTOR

2N647

Ge n-p-n alloy-junction type used in large-signal af-amplifier applications in battery-operated portable radio receivers and phonographs. N-P-N construction permits complementary push-pull operation with a matching p-n-p type, such as the 2N217. JEDEC TO-1, Outline No.1. Terminals: 1 - emitter, 2 - base, 3 - collector (red dot).

MAXIMUM RATINGS

Collector-to-Base Voltage	V_{CBO}	25	V
Collector-to-Emitter Voltage	V_{CEO}	25	V
Emitter-to-Base Voltage	V_{EBO}	12	V
Collector Current	I_C	100	mA
Emitter Current	I_E	-100	mA
Transistor Dissipation:			
$T_A = 25^{\circ}\text{C}$	P_T	100	mW
$T_A = 55^{\circ}\text{C}$	P_T	50	mW
$T_A = 71^{\circ}\text{C}$	P_T	20	mW
Temperature Range:			
Operating (Ambient)	T_A (opr)	-65 to 71	$^{\circ}\text{C}$
Storage	T_{STG}	-65 to 85	$^{\circ}\text{C}$

CHARACTERISTICS

Collector-Cutoff Current ($V_{CB} = 25$ V, $I_E = 0$)	I_{CBO}	14 max	μA
Emitter-Cutoff Current ($V_{EB} = 12$ V, $I_C = 0$)	I_{EBO}	14 max	μA
Static Forward-Current Transfer Ratio ($V_{CE} = 1$ V, $I_C = 50$ mA)	h_{FE}	70	

TYPICAL OPERATION IN CLASS B COMPLEMENTARY-SYMMETRY CIRCUIT

DC Collector-Supply Voltage	V_{CC}	6	V
DC Collector-to-Emitter Voltage for driver stage	V_{CE}	2.3	V
Zero-Signal DC Base-to-Emitter Voltage for output stage	V_{BE}	0.14	V
Peak Collector Current for each transistor in output stage	i_C (peak)	70	mA
Zero-Signal DC Collector Current for each transistor (driver and output stage)	I_C	1.5	mA
Signal Frequency		1	kc/s
Input Resistance	R_S	1100	Ω
Load Resistance	R_L	45	Ω
Power Gain		54	dB
Total Harmonic Distortion		10	%
Power Output (input = 20 mV)	P_{OE}	100	mW

TRANSISTOR

2N649

Ge n-p-n alloy-junction type used in large-signal af-amplifier applications in battery-operated portable radio receivers and phonographs. N-P-N construction permits complementary push-pull operation with a matching