

Power Transistors

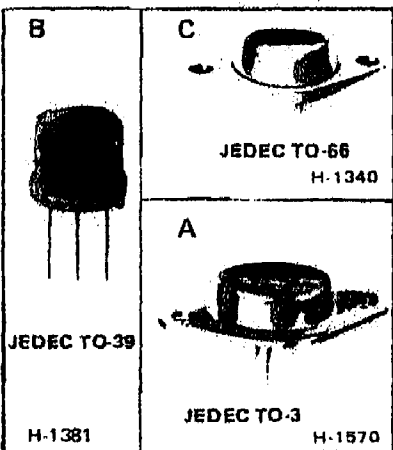
40309—40328
 40360—40364

N-P-N and P-N-P Silicon Power Transistors

For Audio-Frequency Amplifier Applications

Features:

- Hermetically-sealed packages
- Operation at case temperatures up to 257°F
- Pellet bonded to header — for greater power-handling capability for greater shock resistance
- Freedom from second breakdown



40309—40328 and 40360—40364 are diffused-junction silicon n-p-n and p-n-p transistors intended for specific applications in audio amplifiers, giving high-quality performance economically. These types cover applications from low-level input stages to high-power output

stages of 5 to 50 watts. Supply voltages range from the nominal 12-volt vehicular type to 117-volt ac-dc type. The use of all-silicon devices permits more flexibility in the mechanical and electrical design of amplifiers since the output heat sinks can be held to a minimum.

MAXIMUM RATINGS (Absolute-Maximum Values)

CHARACTERISTIC	40309	40323	40311	40315	40314	40317	40319	40320	40326	40321	40327	40360	40361	40362	UNITS
V _{CEO} (sus)	18	18	30	35	40	40	40	40	40	—	—	70	—	—	V
V _{CER} (sus)*	—	—	—	—	—	—	—	—	—	300	300	—	70	-70	V
V _{CEV} **	—	—	—	—	—	—	—	—	—	—	—	—	—	—	V
V _{EB0}	2.5	2.5	2.5	2.5	2.5	2.5	-2.5	2.5	2.5	5	5	4	4	-4	V
V _{CB0}	—	—	—	—	—	—	—	—	—	—	—	—	—	—	V
I _C	0.7	0.7	0.7	0.7	0.7	0.7	-0.7	0.7	0.7	1	1	0.7	0.7	-0.7	A
I _B	0.2	0.2	0.2	0.2	0.2	0.2	-0.2	0.2	0.2	0.5	0.5	0.2	0.2	-0.2	A
P _T ***															
T _C up to 25°C	5	5	5	5	5	5	5	5	5	5	5	5	5	5	W
T _{FA} up to 25°C	1	1	1	1	1	1	1	1	1	1	1	1	1	1	W
T _C of 175°C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W
TEMP. RANGE: Oper. Junction	←————— 65 to 200°C —————→														°C

*R_{BE} = 500 Ω
 R_{BE} = 1,000 Ω for 40327
 R_{BE} = 200 Ω for 40361,
 40362, & 40363
 R_{BE} = 150 Ω for 40364

**V_{BE} = -1.5V

*** At other temperatures see derating curves

MAXIMUM RATINGS (Absolute-Maximum Values) (Cont'd.)

CHARACTERISTIC	40325	40363	40310	40324	40316	40312	40313	40318	40322	40328	40364	UNITS
V _{CEO(sus)}	35	-	35	35	-	-	-	-	-	-	-	V
V _{CER(sus)*}	-	70	-	-	40	60	300	300	300	300	60	V
V _{CEV**}	35	-	-	-	-	-	-	-	-	-	-	V
V _{EBO}	5	4	2.5	2.5	5	2.5	2.5	6	6	6	4	V
V _{CBO}	35	-	-	-	-	-	-	-	-	-	-	V
I _C	15	15	4	4	4	4	2	2	2	2	7	A
I _B	7	7	2	2	2	2	1	1	1	1	5	A
P _{T***}												
T _C up to 25°C	117	115	29	29	29	29	35	35	35	35	35	W
T _{FA} up to 25°C	-	-	-	-	-	-	-	-	-	-	-	W
T _C of 175°C	-	-	-	-	-	-	5	5	5	5	-	W
TEMP. RANGE: Oper. Junction	-65 to 200°C											°C

* R_{BE} = 500 Ω

R_{BE} = 1,000 Ω for 40327

R_{BL} = 200 Ω for 40361,
40362, & 40363

R_{BE} = 150 Ω for 40364

**V_{BE} = -1.5V

*** At other temperatures see derating curves

ELECTRICAL CHARACTERISTICS for Types in TO-3 Package

CHARACTERISTIC	TEST CONDITIONS					LIMITS		UNITS
	V _{CB}	V _{CE}	V _{EB}	I _C	T _C	40525	40363	
	Volts			mA	°C			
I _{CBO} (Max.)	30				25	5		mA
	30				150	10		
I _{CER} [▲] (Max.)		60			25		1	mA
		60			150		10	
I _{EBO} (Max.)			5			10		mA
			4				5	
BV _{CEO} (sus)(Min.)				200		35		V
V _{CER} (sus) [▲] (Min.)				200			70	V
BV _{CBO} (Min.)				100		35		V
V _{BE} (Max.)		4		8A		2		V
		4		4A			1.8	
V _{CE} (sat)(Max.)				8A [*]		1.5		V
				4A ^{**}			1.1	
h _{FE}		4		8A		12-60		
		4		4A			20-70	
θ _{J-C} (Max.)						1.5	1.5	°C/W
f _T (Typ.)		4		3A			700	kHz

^{*}I_B = 800 mA

^{**}I_B = 400 mA

[▲]R_{BE} = 200 Ω

ELECTRICAL CHARACTERISTICS for Types in TO-5 or TO-39 Package

CHARACTERISTIC	TEST CONDITIONS					LIMITS							UNITS
	V _{CB}	V _{CE}	V _{EB}	I _C	T _C	40309	40311	40314	40315	40317	40319	40320	
	Volts			mA	°C								
I _{CBO} (Max.)	15				25	0.25	0.25	0.25	0.25	0.25		0.25	μA
	-15				25						-0.25		
	15				150	1	1	1	1	1		1	mA
	-15				150						-1		
I _{EBO} (Max.)			2.5			1	1	1	1	1		1	mA
			-2.5								-1		
V _{CEO(sus)} (Min.)				100*		18*	30	40	35*	40		40	V
				-100*							-40†		
V _{BE} (Max.)		4		50		1	1	1	1				V
		4		10					1		1		
		-4		-50							-1.0		
V _{CE(sat)} (Max.)				150‡				1.4			-1.4		V
h _{FE}		4		50		70-350	70-350	70-350	70-350				
		-4		-50							35-200		
		4		10						40-200		40-200	
θ _{J-C} (Max.)						35	35	35	35	35	35	35	°C/W
θ _{J-FA} (Max.)						175	175	175	175	175	175		°C/W
f _T (Typ.)		10		50		100	100		100				mHz
		-4		-50							100		
		4		50				100					

* Pulsed; pulse duration = 300 μsec, duty factor < 2%.

‡ I_B = 15 mA

■ R_{BE} = 1,000 ohms

• BV_{CEO} value.

R_{BE} = 200 Ω for 40361 & 40362

† Negative value for 40362

JEDEC TO-3

TERMINAL CONNECTIONS

Pin 1 - Base

Pin 2 - Emitter

Case - Collector

Mounting Flange - Collector

JEDEC TO-39

TERMINAL CONNECTIONS

Lead 1 - Emitter

Lead 2 - Base

Lead 3 - Collector, case

JEDEC TO-66

TERMINAL CONNECTIONS

Pin 1 - Base

Pin 2 - Emitter

Mounting Flange, Case-Collector