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Power Transistors

40309—40328
40360—40364

B



JEDEC TO-39

H-1381

C



JEDEC TO-66

H-1340

A



JEDEC TO-3

H-1570

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_{EBO}	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_{CBO}	–	–	–	–	–	–	–	–	–	–	–	–	–	–	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

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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_{BE} = 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

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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

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