

File Number 1312

BU323, BU323A

**10-Ampere N-P-N Monolithic
Darlington Power Transistors**350, 400 Volts, 175 Watts
Gain of 150 at 6 A**Features:**

- Operates from IC without predriver
- High voltage breakdown
- High reverse second-breakdown capability

Applications:

- Power switching
- Automotive ignition
- Solenoid drivers
- Series and shunt regulators

The BU323 and BU323A are monolithic n-p-n silicon Darlington transistors designed for automotive electronic power applications..

These devices provide good forward and reverse second-breakdown capability; their high gain makes it possible for them to be driven directly from integrated circuits.

The BU323 and BU323A are supplied in the JEDEC TO-204AA hermetic steel package.

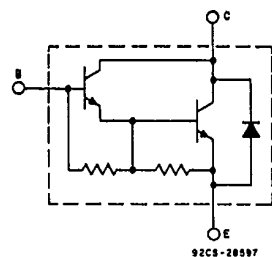
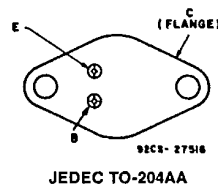
TERMINAL DESIGNATIONS

Fig. 1-Schematic diagram for both types.

MAXIMUM RATINGS, Absolute-Maximum Values:

	BU323	BU323A	
V_{CBO}	500	600	V
$V_{CER(sus)}$ $R_{BE}=100\ \Omega$	400	475	V
$V_{CEO(sus)}$	350	400	V
V_{EBO}	8	8	V
I_C	10	10	A
I_{CM}	16	16	A
I_B	3	3	A
P_T $T_C \leq 25^\circ C$	175	175	W
$T_C > 25^\circ C$	See Fig. 2		
T_{stg}, T_J	-65 to +200		$^\circ C$
T_L At distances $\geq 1/8$ in. (3.17 mm) from case for 10 s max.	235		$^\circ C$

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ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) 25°C unless otherwise specified

CHARACTERISTIC	TEST CONDITIONS				LIMITS				UNITS
	VOLTAGE V dc		CURRENT A dc		BU323		BU323A		
	V _{CE}	V _{BE}	I _C	I _B	Min.	Max.	Min.	Max.	
I _{CER} R _{BE} =100 Ω	400 475				—	1	—	—	mA
I _{EBO}		-6	0		—	40	—	40	
I _{CBO}	500 ^b 600 ^b				—	1	—	— 1	
V _{CE(sus)} R _{BE} =100 Ω L=500 μH			4		400	—	475	—	V
V _{CEO(sus)}			0.2 ^a	0	350	—	400	—	
h _{FE}	6		3 ^a		300	—	300	—	
	6		6 ^a		150	2000	150	2000	
	6		10 ^a		50	—	50	—	
V _{CE(sat)} T _C =-40° C			3 ^a	0.06 ^a	—	1.5	—	1.5	V
			6 ^a	0.12 ^a	—	1.7	—	1.7	
			10 ^a	0.30 ^a	—	2.7	—	2.7	
V _{BE(sat)} T _C =-40° C			6 ^a	0.12	—	2.2	—	2.2	V
			10 ^a	0.30	—	3	—	3	
			6 ^a	0.12	—	2.4	—	2.4	
V _{BE(On)}	6		10 ^a		—	2.5	—	2.5	
V _F			10 ^a		—	3.5	—	3.5	
C _{ob} f=100 kHz	10 ^b				—	350	—	350	pF
I _C ² L/2 (See Fig. 9)					550	—	550	—	mJ
t _s I _{B1} =I _{B2}	12 ^c		6	0.3	—	15	—	15	μs
t _f I _{B1} =I _{B2}	12 ^c		6	0.3	—	15	—	15	
h _{fe} f=1 MHz	5		1		10	—	10	—	
I _{S/b} t=1 s, nonrep.	50				3.5	—	3.5	—	A
R _{θJC}					—	1	—	1	°C/W

^aPulsed; Pulse duration=300 μs , duty factor=1.8%.^b V_{CB} value.^c V_{CC} value.

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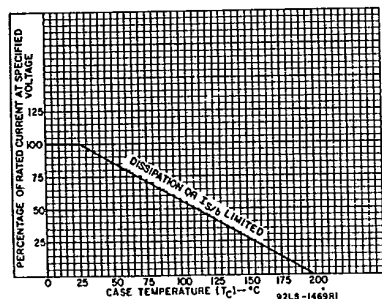


Fig. 2 — Dissipation derating curve for both types.

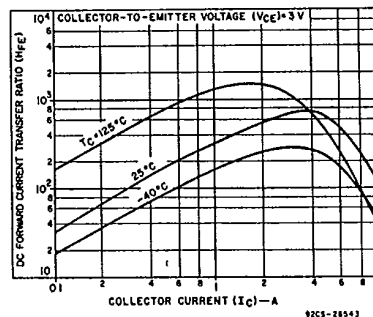


Fig. 3 — Typical DC beta characteristics for both types.

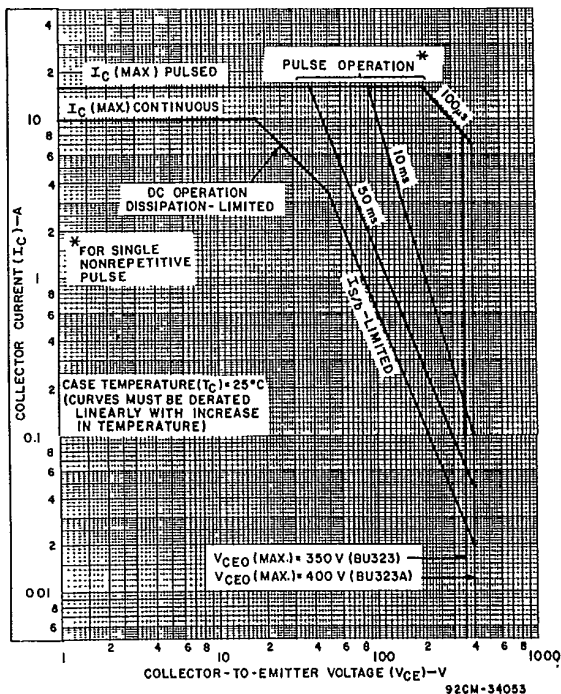


Fig. 4 — Maximum operating areas for both types.

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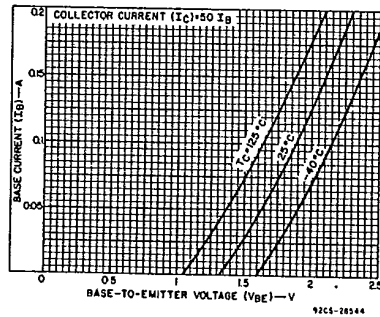


Fig. 5 — Typical input characteristics for both types.

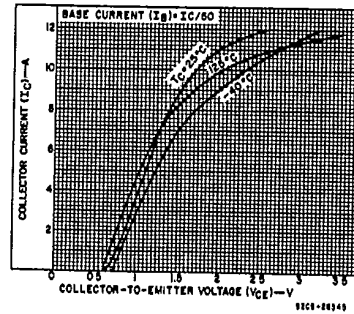


Fig. 6 — Typical output characteristics for both types.

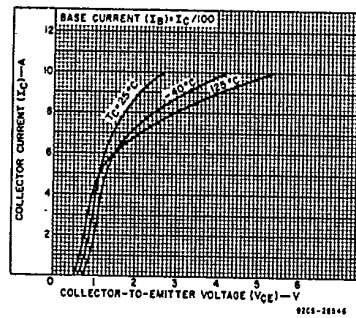


Fig. 7 — Typical output characteristics for both types.

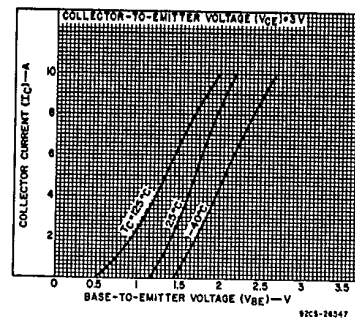


Fig. 8 — Typical transfer characteristics for both types.

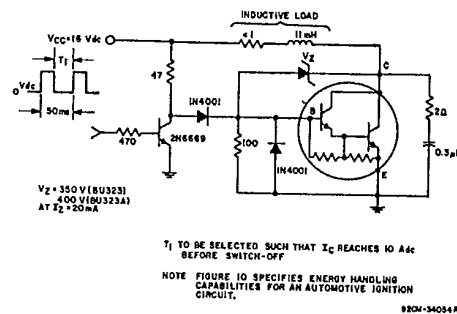


Fig. 9 — Ignition test circuit.