File Number 1312

BU323, BU323A

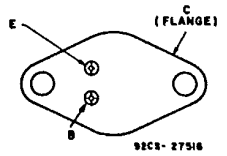
10-Ampere N-P-N Monolithic Darlington Power Transistors

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*
- *Solenoid drivers*
- *Automotive ignition*
- *Series and shunt regulators*

TERMINAL DESIGNATIONS



JEDEC TO-204AA

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.

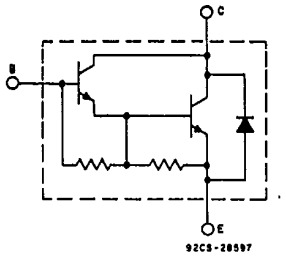


Fig. 1-Schematic diagram for both types.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	BU323	BU323A	
V_{CBO}	500	600	V
$V_{CER(sus)}$			
R_{BE}=100 Ω	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			
$T_C \leq 25°C$	175	175	W
$T_C > 25°C$	See Fig. 2		
T_{stg}, T_J	-65 to +200		°C
T_L			
At distances ≥ 1/8 in. (3.17 mm) from case for 10 s max.	235		°C

BU323, BU323A

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}	400				—	1	—	—	mA
R_{BE}=100 Ω	475				—	—	—	1	
I_{EBO}		-6	0		—	40	—	40	
I_{CBO}	500[b]				—	1	—	—	
	600[b]				—	—	—	1	
V_{CER}(sus)									V
R_{BE}=100 Ω			4		400	—	475	—	
L=500 μH									
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)			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	
T_C=-40° C			6[a]	0.12[a]	—	2.0	—	2.0	
V_{BE}(sat)			6[a]	0.12	—	2.2	—	2.2	V
			10[a]	0.30	—	3	—	3	
T_C=-40° C			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}	10[b]				—	350	—	350	pF
f=100 kHz									
$\frac{1}{2}C^2L$/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	
$\|h_{fe}\|$	5		1		10	—	10	—	
f=1 MHz									
$I_{S/b}$	50				3.5	—	3.5	—	A
t=1 s, nonrep.									
$R_{\theta JC}$					—	1	—	1	°C/W

[a]Pulsed: Pulse duration=300 μs, duty factor=1.8%.
[b]V_{CB} value.
[c]V_{CC} value.

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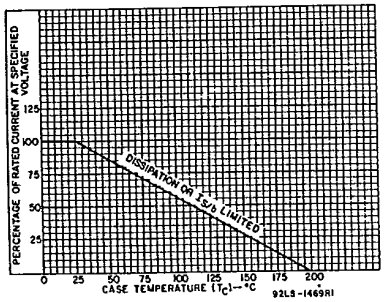

Fig. 2 — Dissipation derating curve for both types.

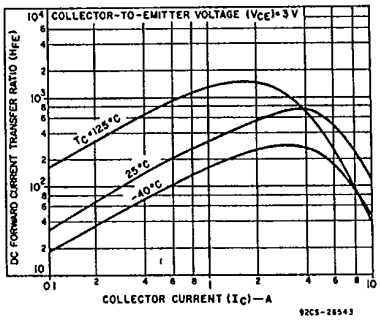

Fig. 3 — Typical DC beta characteristics for both types.

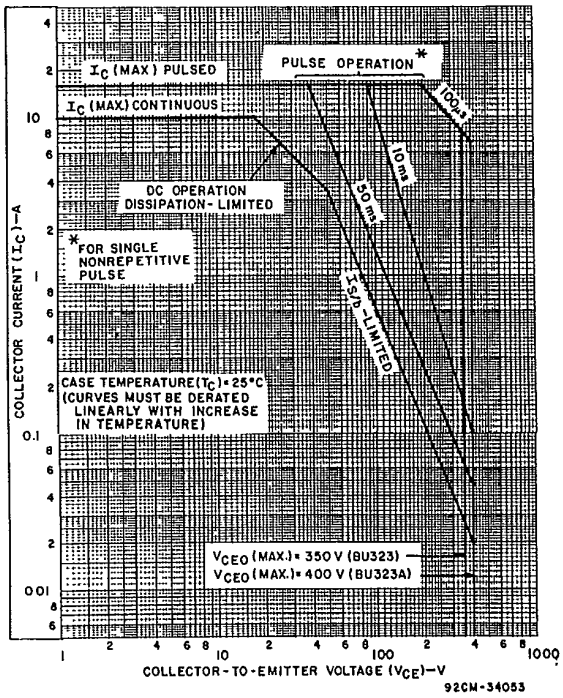

Fig. 4 — Maximum operating areas for both types.

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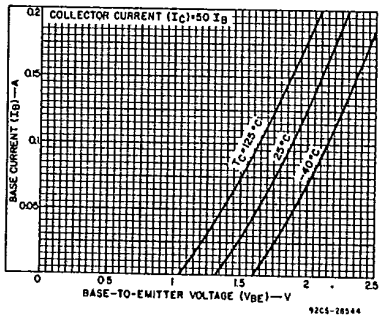

Fig. 5 — Typical input characteristics for both types.

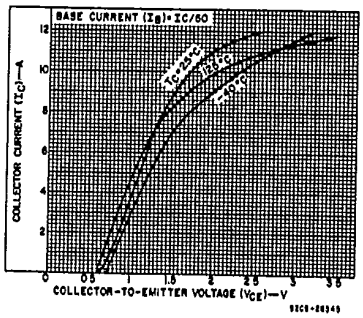

Fig. 6 — Typical output characteristics for both types.

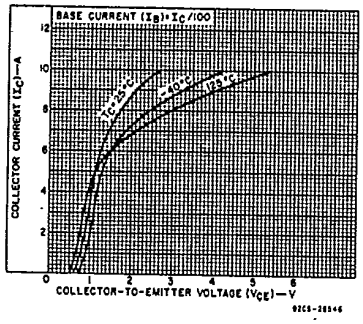

Fig. 7 — Typical output characteristics for both types.

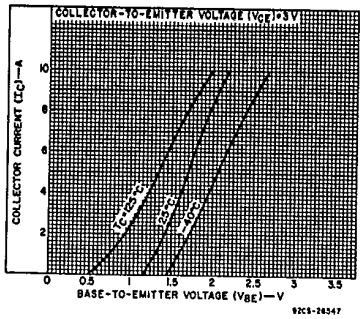

Fig. 8 — Typical transfer characteristics for both types.

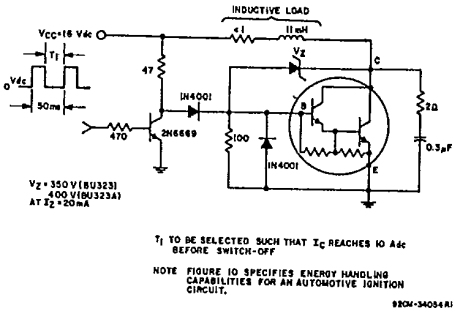

Fig. 9 — Ignition test circuit.