MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

BU522
BU522A
BU522B

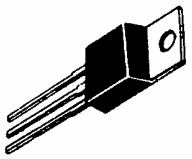
HIGH VOLTAGE SILICON POWER DARLINGTONS

Power Transistor mainly intended for use as ignition circuit output transistor.

- Specified minimum sustaining voltage:
  $V_{CER(sus)}$ = 350 V (BU522)
  at I_C = 1 A 400 V (BU522A)
  425 V (BU522B)
- High S.O.A. capability:
  V_{CE} = 350 V (BU522) at I_C = 5 A
  400 V (BU522A, BU522B)
- Low $V_{CE(sat)}$ = 2.0 V max. at I_C = 4 A (BU522A, BU522B)

7 AMPERES
DARLINGTON
TRIPLE DIFFUSED
POWER TRANSISTORS
NPN SILICON

375, 425, 450 VOLTS
75 WATTS



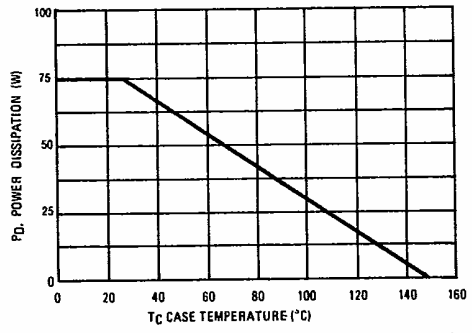
MAXIMUM RATINGS

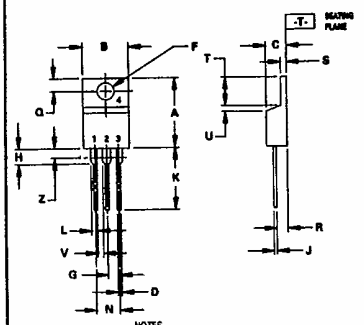
Rating	Symbol	BU522	BU522A	BU522B	Unit
Collector-Emitter Voltage Sust.	$V_{CER(sus)}$	350	400	425	Vdc
Collector-Emitter Voltage	V_{CER}	375	425	450	Vdc
Collector-Base Voltage	V_{CBO}	400	450	475	Vdc
Emitter-Base Voltage	V_{EBO}	5.0			Vdc
Collector Current - Continuous	I_C	7.0			Adc
Base Current	I_B	2.0			Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	75 0.60			Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to 150			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.67	°C/W

FIGURE 1 – POWER DERATING





NOTES.
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIM Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	14.48	15.75	0.570	0.620
B	9.66	10.28	0.380	0.405
C	4.07	4.82	0.160	0.190
D	0.64	0.88	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.42	2.66	0.095	0.105
H	2.80	3.93	0.110	0.155
J	0.46	0.71	0.018	0.028
K	12.70	14.27	0.500	0.562
L	1.15	1.39	0.045	0.055
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.15	1.39	0.045	0.055
T	5.97	6.47	0.235	0.255
U	0.00	1.27	0.000	0.050
V	1.15	—	0.045	—
Z	—	2.04	—	0.080

STYLE 1
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

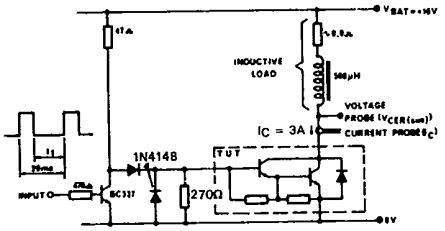
CASE 221A-04
TO-220AB

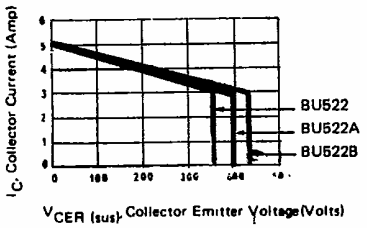
3

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (See Figure 2) (I_C = 1.0 A) See Figure 2 BU522 BU522A BU522B	$V_{CER(sus)}$	 350 400 425			Vdc
Collector Cutoff Current (Rated V_{CER}, R_{BE} = 270 Ω)	I_{CER}			1.0	mAdc
Collector Cutoff Current (Rated V_{CBO}, I_E = 0)	I_{CBO}			1.0	mAdc
Emitter Cutoff Current (V_{EB} = 5.0 Vdc, I_C = 0)	I_{EBO}			40	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 2.5 Adc, V_{CE} = 5 Vdc)	h_{FE}	250			
Collector-Emitter Saturation Voltage BU522 (I_C = 4 Adc, I_B = 80 mAdc) BU522A, BU522B	$V_{CE(sat)}$			2.5 2	Vdc
Base-Emitter Saturation Voltage (I_C = 4 Adc, I_B = 80 mAdc)	$V_{BE(sat)}$			2.5	Vdc
DYNAMIC CHARACTERISTICS					
Current Gain – Bandwidth Product (I_C = 0.3 mAdc, V_{CE} = 5.0 Vdc, f_{test} = 1.0 MHz)	f_T		7.5		MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 0.1 MHz	C_{ob}		150		pF

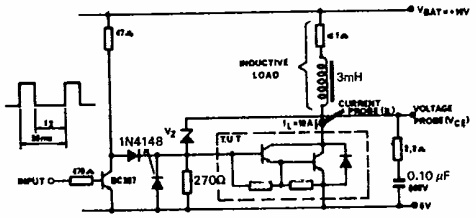
FIGURE 2 – SUSTAINING VOLTAGE TEST $V_{CER\ (sus)}$





t_1 to be selected that I_C reaches 3 Adc before switch-off
Case temperature of the power transistor T_C = 25°C

Test conditions of the Collector-Base Clamping Circuit:



Clamping device characteristics:

V_Z = 350 V (BU522) / 400 V (BU522A/B) ± 1% at I_Z = 20 mA

Clamping duration is around 45 μsec (BU522) / 40 μsec (BU522A/B)

t_2 to be selected that I_L reaches 5 Adc before switch-off

Case temperature of the power transistor: T_C = 25°C.

FIGURE 3 – S.O.A. TEST

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