DIGITRON Semiconductors

High-reliability discrete products
and engineering services since 1977

BUX48(A)

NPN HIGH VOLTAGE TRANSISTOR

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Characteristic	Symbol	BUX48	BUX48A	Unit
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	400	450	V
Collector-Emitter Voltage (V_{BE} = -1.5V)	V_{CEX}	850	1000	V
Emitter-Base Voltage	V_{EBO}	7.0		V
Collector Current – continuous **Peak**(1) **Overload**	I_C I_{CM} I_{OI}	15 30 60		A
Base Current **Peak** (1)	I_B I_{BM}	5 20		A
Total Power Dissipation @ T_C = 25°C @ T_C = 100°C Derate Above 25°C	P_D	175 100 1		W W W/°C
Junction and Storage Temperature Range	T_J, T_{stg}	-65 to +200		°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.0		°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 seconds	T_L	275		°C

Note 1: Pulse test: Pulse width = 5ms, Duty Cycle ≤ 10%.

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Sustaining Voltage(1) (I_B = 0, I_C = 200mA, L = 25mH)	BUX48 BUX48A	$V_{CEO(sus)}$	400 450	- -	- -	V
Collector Cutoff Current (V_{CEX} = Rated Value, $V_{BE(off)}$ = 1.5V) (V_{CEX} = Rated Value, $V_{BE(off)}$ = 1.5V, T_C = 125°)		I_{CEX}	- -	- -	0.2 2.0	mA
Collector Cutoff Current (V_{BE} = Rated V_{CEX} , R_{BE} = 10Ω) (V_{BE} = Rated V_{CEX} , R_{BE} = 10Ω, T_J = 125°C)		I_{CER}	- -	- -	0.5 3.0	mA
Emitter Cutoff Current (V_{EB} = 5.0V, I_C = 0)		I_{EBO}	-	-	0.1	mA
Emitter-Base Breakdown Voltage (-I_C = 0, I_E = 50mA)		$V_{(BR)EBO}$	7	-	-	V
ON CHARACTERISTICS (1)						
DC Current Gain (I_C = 10A, V_{CE} = 5V) (I_C = 8A, V_{CE} = 5V)	 BUX48 BUX48A	h_{FE}	 8 8	 - -	 - -	-
Collector-Emitter Saturation Voltage (I_C = 10A, I_B = 2A) (I_C = 15A, I_B = 3A) (I_C = 10A, I_B = 2A, T_C = 100°C) (I_C = 8A, I_B = 1.6A) (I_C = 12A, I_B = 2.4A) (I_C = 8A, I_B = 1.6A, T_C = 100°C)	 BUX48 BUX48A 	 $V_{CE(sat)}$ 	 - - - - - -	 - - - - - -	 1.5 5.0 2.0 1.5 5.0 2.0	V

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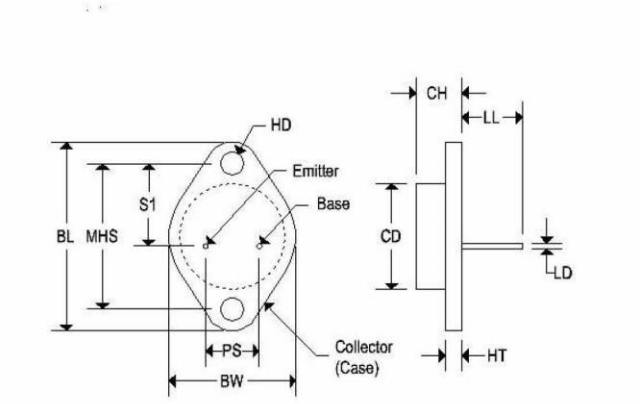
Characteristic		Symbol	Min	Typ	Max	Unit
Base-Emitter Saturation Voltage						
(I_C = 10A, I_B = 2A)	BUX48		-	-	1.6	
(I_C = 10A, I_B = 2A, T_C = 100°C)		$V_{BE(sat)}$	-	-	1.6	V
(I_C = 8A, I_B = 1.6A)	BUX48A		-	-	1.6	
(I_C = 8A, I_B = 1.6A, T_C = 100°C)			-	-	1.6	
Output Capacitance (V_{CB} = 10V, I_E = 0, f_{test} = 1MHz		C_{ob}	-	-	350	pF
SWITCHING CHARACTERISTICS (RESISTIVE LOAD)						
Delay Time	**BUX48** I_C = 10A, I_B = 2A, Duty Cycle = 2%, $V_{BE(off)}$ = 5V, T_p = 30µs, V_{CC} = 300V	t_d	-	0.1	0.2	µs
Rise Time		t_{on}	-	0.4	0.7	
Storage Time		t_s	-	1.3	2.0	
Fall Time		t_f	-	0.2	0.4	
Delay Time	**BUX48A** I_C = 8A, I_B = 1.6A, Duty Cycle = 2%, $V_{BE(off)}$ = 5V, T_p = 30µs, V_{CC} = 300V	t_d	-	0.1	0.2	
Rise Time		t_{on}	-	0.4	0.7	
Storage Time		t_s	-	1.3	2.0	
Fall Time		t_f	-	0.2	0.4	
INDUCTIVE LOAD, CLAMPED						
Storage Time	**BUX48** I_C = 10A, I_{B1} = 2A	t_{sv}	-	1.3	-	µs
Fall Time		t_{fi}	-	0.06	-	
Storage Time	**BUX48A** I_C = 8A, I_{B1} = 1.6A, T_C = 100°C	t_{sv}	-	1.5	2.5	µs
Crossover Time		t_c	-	0.3	0.6	
Fall Time		t_f	-	0.17	0.35	

Note 1: Pulse test: Pulse width = 300µs, duty cycle ≤ 2%.
V_{cl} = 300V, $V_{BE(off)}$ = 5V, L_C = 180µh

MECHANICAL CHARACTERISTICS

Case:	TO-3
Marking:	Alpha-Numeric
Polarity:	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

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DC CHARACTERISTICS

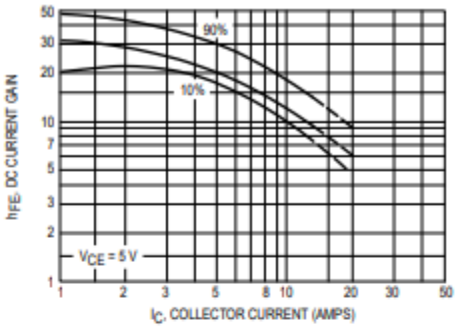

Figure 1. DC Current Gain

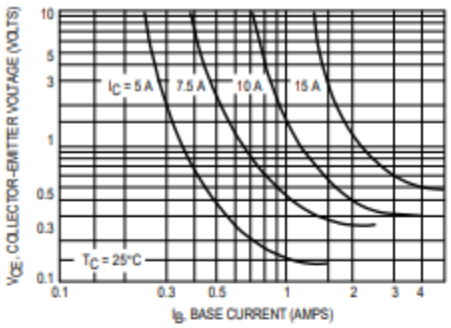

Figure 2. Collector Saturation Region

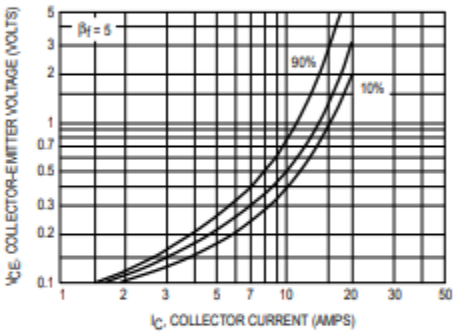

Figure 3. Collector–Emitter Saturation Voltage

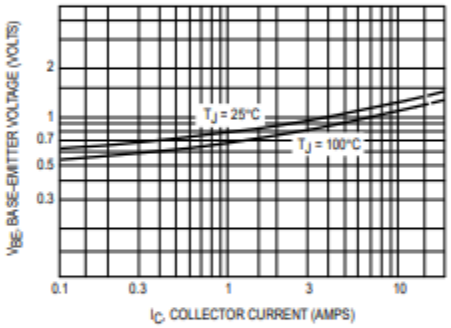

Figure 4. Base–Emitter Voltage

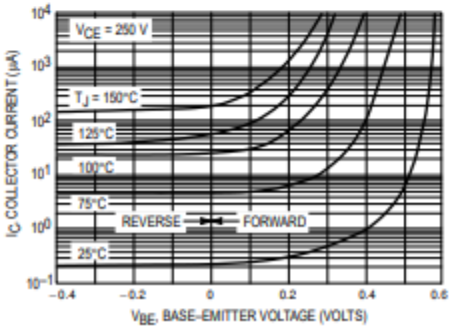

Figure 5. Collector Cutoff Region

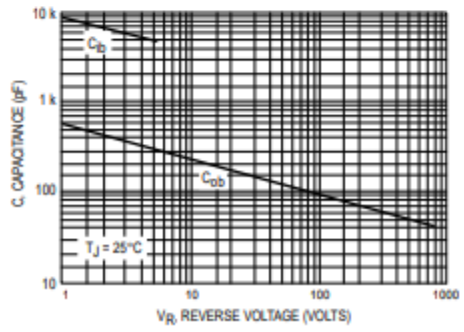

Figure 6. Capacitance

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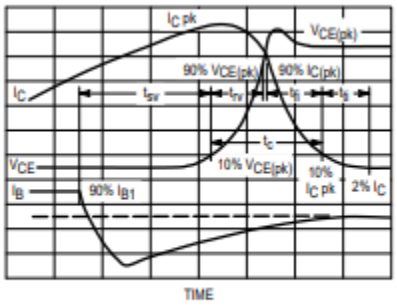

Figure 7. Inductive Switching Measurements

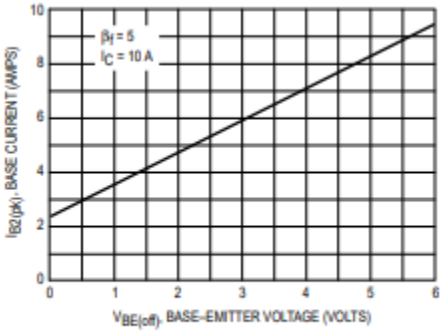

Figure 8. Peak–Reverse Current

INDUCTIVE SWITCHING

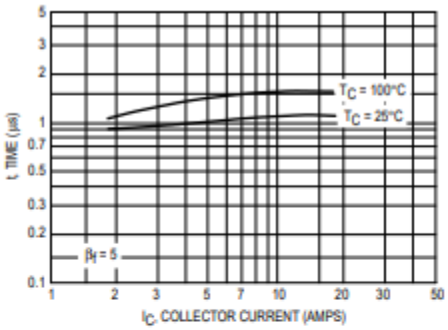

Figure 9. Storage Time, t_{sv}

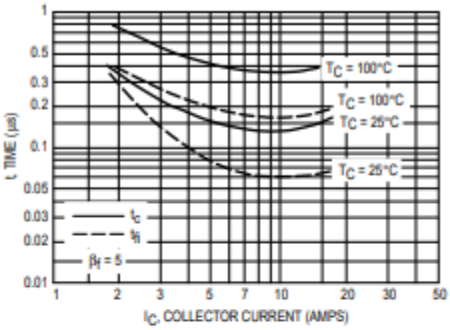

Figure 10. Crossover and Fall Times

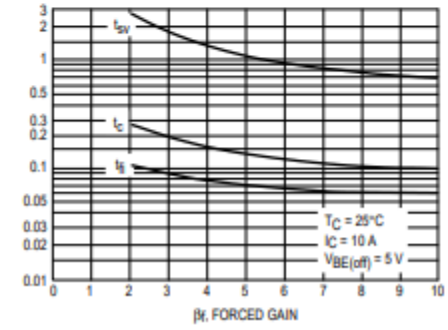

Figure 11a. Turn–Off Times versus Forced Gain

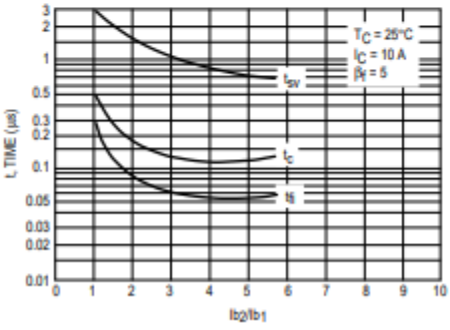

Figure 11b. Turn–Off Times versus Ib_2/Ib_1

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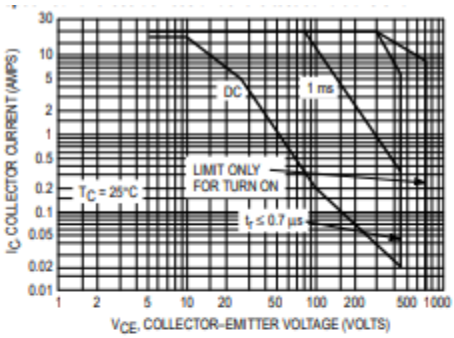

Figure 12. Forward Bias Safe Operating Area

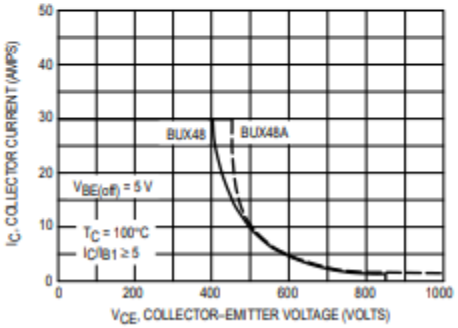

Figure 13. Reverse Bias Safe Operating Area

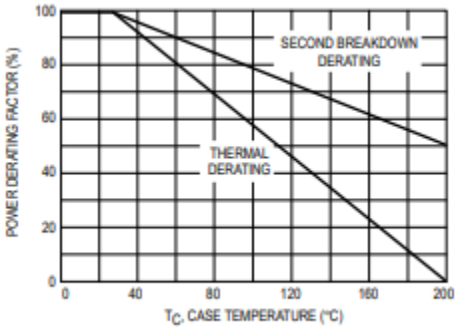

Figure 14. Power Derating

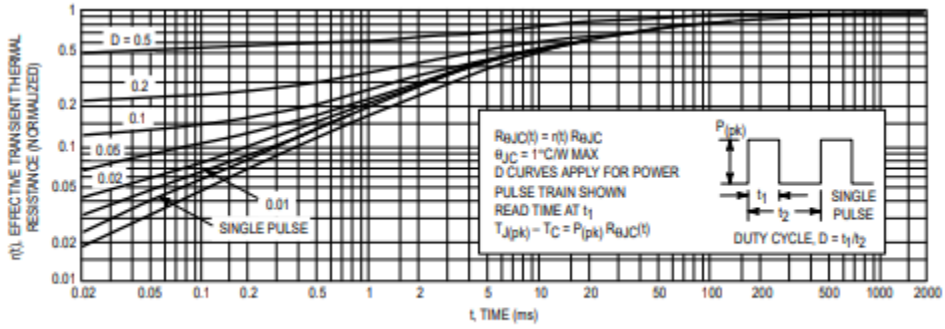

Figure 15. Thermal Response

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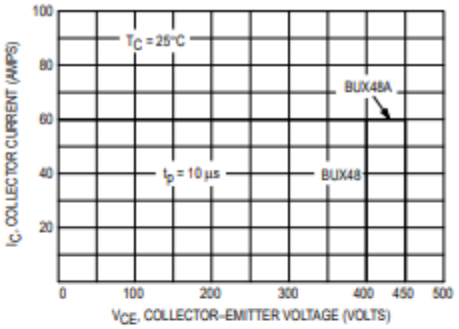

Figure 16. Rated Overload Safe Operating Area (OLSOA)

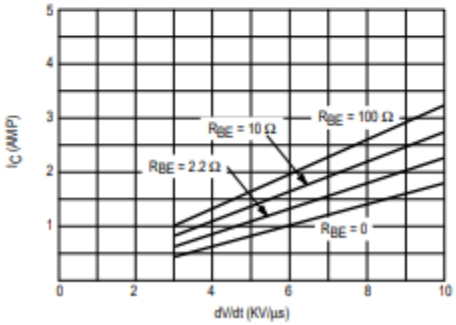

Figure 17. I_C = f(dV/dt)