2SB1224 / 2SD1826 — PNP / NPN Epitaxial Planar Silicon Darlington Transistors Driver Applications

Applications

- Suitable for use in control of motor drivers, printer hammer drivers, relay drivers, and constant-voltage regulators.

Features

- High DC current gain.
- Large current capacity and wide ASO.
- Micaless package facilitating mounting.

Specifications ( ) : 2SB1224

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-)70	V
Collector-to-Emitter Voltage	V_{CEO}		(-)60	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)7	A
Collector Current (Pulse)	I_{CP}		(-)10	A
Collector Dissipation	P_C		2.0	W
		Tc=25°C	25	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(-)40V, I_E=0A			(-)0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)5V, I_C=0A			(-)3.0	mA
DC Current Gain	h_{FE}	V_{CE}=(-)2V, I_C=(-)3.5A	2000	5000		

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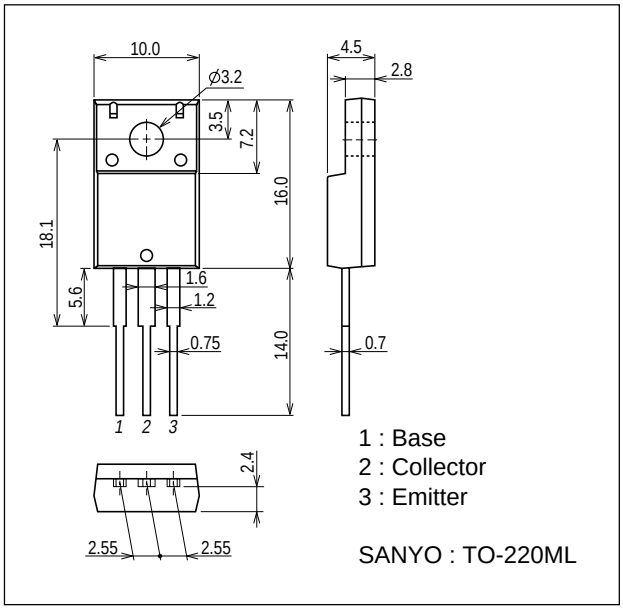
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=(-)5V, I_C=(-)3.5A		20		MHz
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(-)3.5A, I_B=(-)7mA		(-1.0)0.9	(-)1.5	V
Base-to-Emitterr Saturation Voltage	V_{BE}(sat)	I_C=(-)3.5A, I_B=(-)7mA			(-)2.0	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)5mA, I_E=0A	(-)70			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(-)50mA, R_{BE}=∞	(-)60			V
Turn-ON Time	t_{on}	See specified Test Circuit.		(0.5)0.6		μs
Storage Time	t_{stg}	See specified Test Circuit.		(1.5)3.0		μs
Fall Time	t_f	See specified Test Circuit.		(1.4)1.7		μs

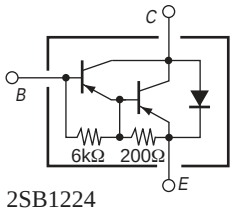
Package Dimensions

unit : mm (typ)

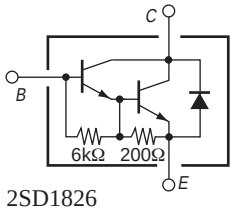
7508-002



Electrical Connection



2SB1224

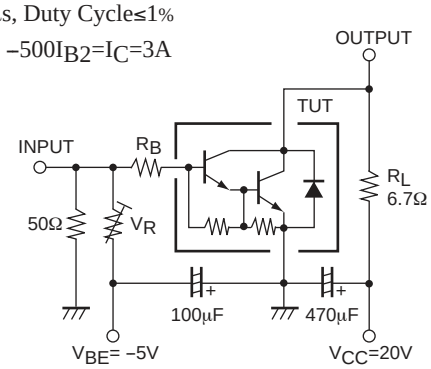


2SD1826

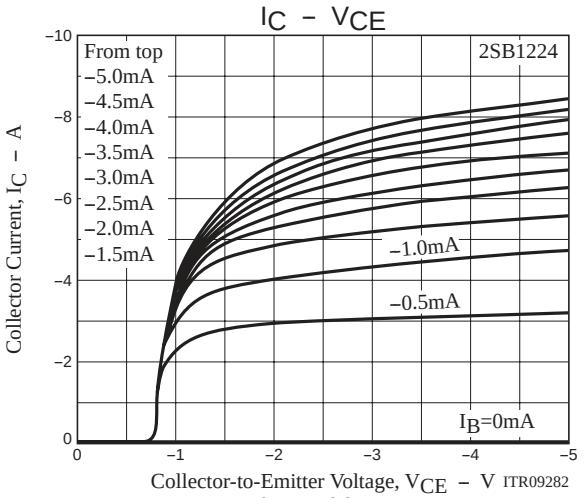
Switching Time Test Circuit

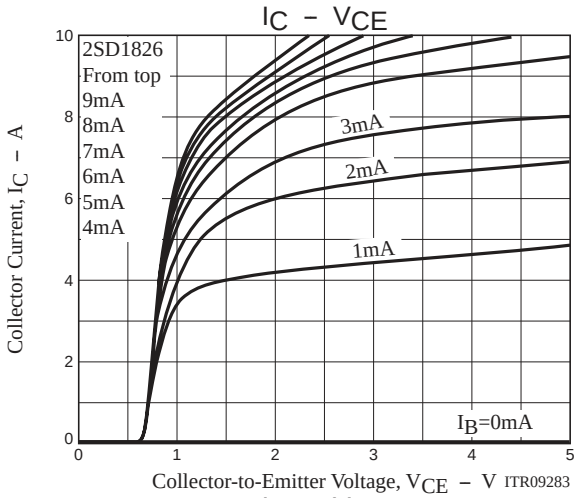
PW=50μs, Duty Cycle≤1%

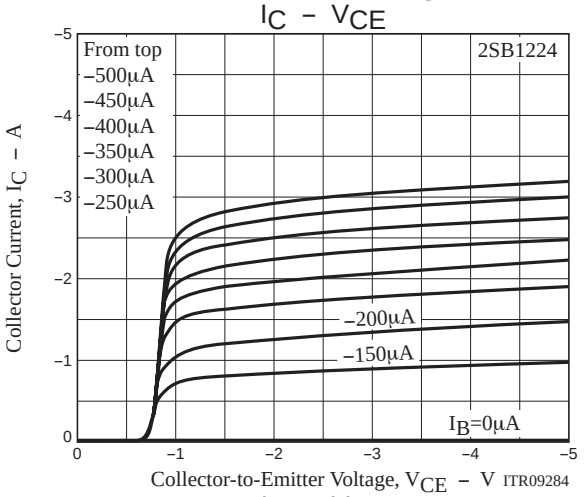
$500I_{B1}$= −$500I_{B2}$=I_C=3A

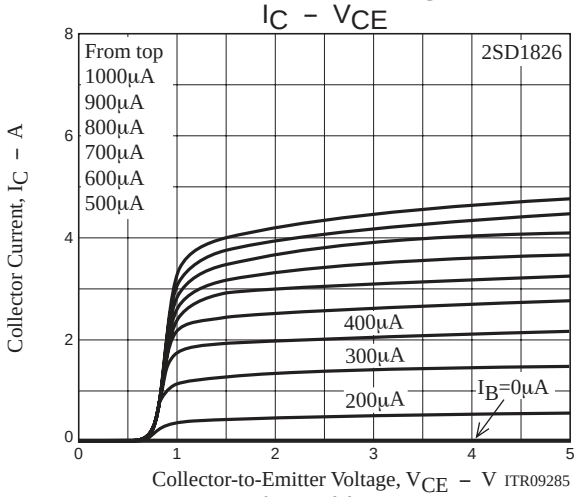


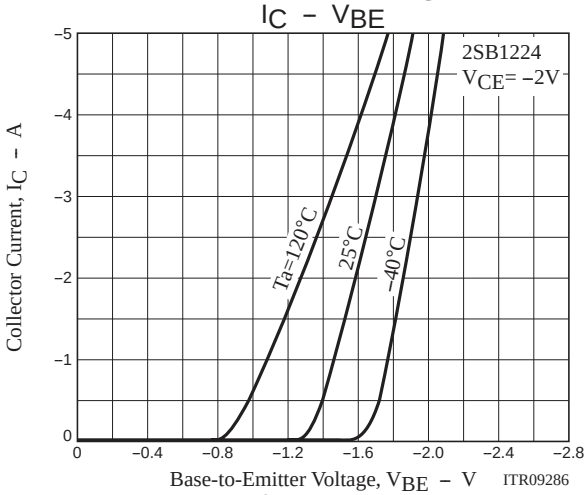
(For PNP, the polarity is reversed.)

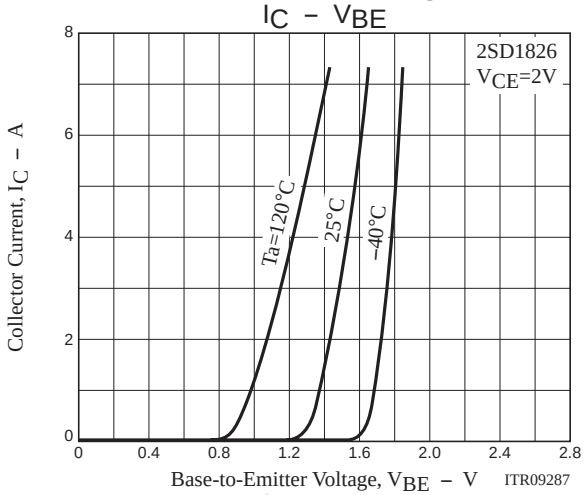

IC – VCE
2SB1224
From top
–5.0mA
–4.5mA
–4.0mA
–3.5mA
–3.0mA
–2.5mA
–2.0mA
–1.5mA
–1.0mA
–0.5mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09282

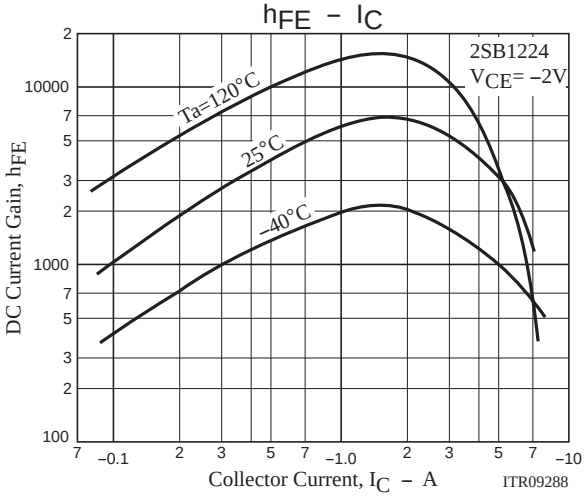

IC – VCE
2SD1826
From top
9mA
8mA
7mA
6mA
5mA
4mA
3mA
2mA
1mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09283

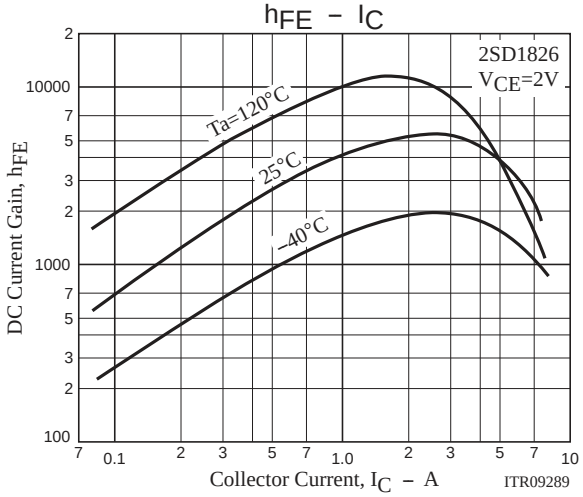

IC – VCE
2SB1224
From top
–500µA
–450µA
–400µA
–350µA
–300µA
–250µA
–200µA
–150µA
IB=0µA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09284

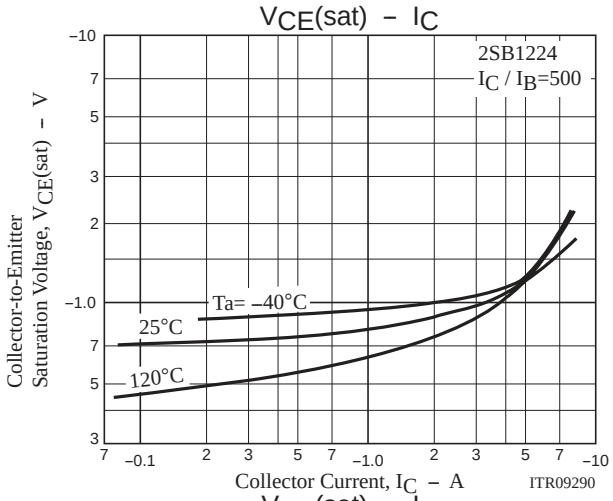

IC – VCE
2SD1826
From top
1000µA
900µA
800µA
700µA
600µA
500µA
400µA
300µA
200µA
IB=0µA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09285

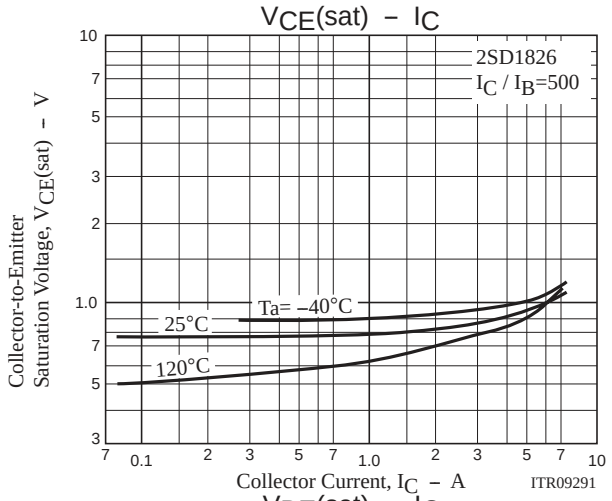

IC – VBE
2SB1224
VCE= –2V
Ta=120°C
25°C
–40°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR09286

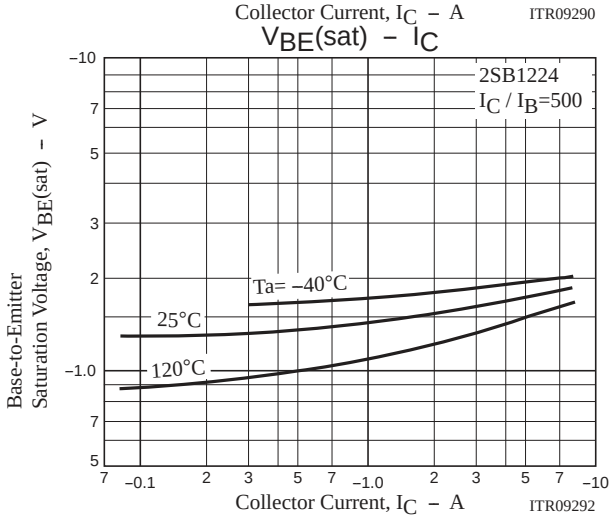

IC – VBE
2SD1826
VCE=2V
Ta=120°C
25°C
–40°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR09287

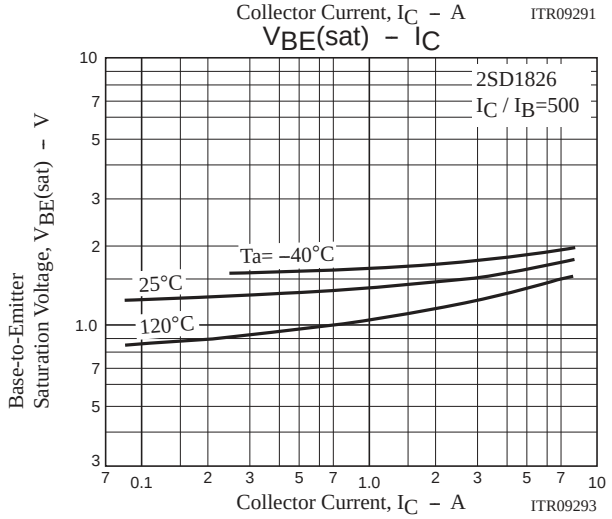

hFE – IC
2SB1224
VCE= –2V
Ta=120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – A
ITR09288

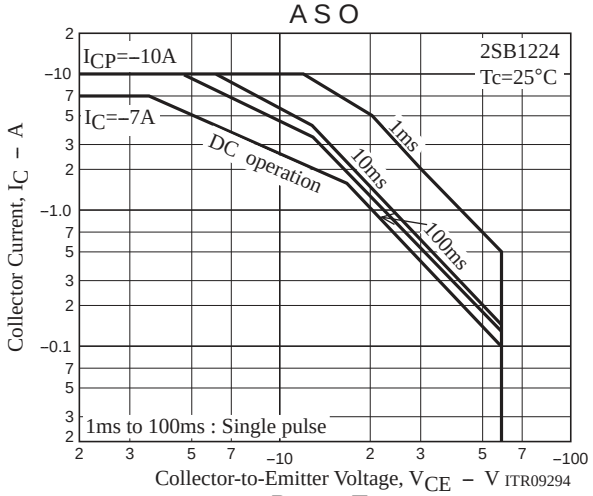

hFE – IC
2SD1826
VCE=2V
Ta=120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – A
ITR09289

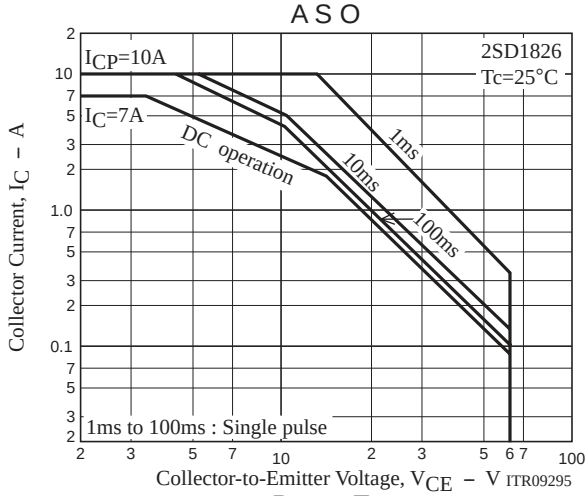

VCE(sat) – IC
2SB1224
IC / IB=500
Ta= –40°C
25°C
120°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR09290

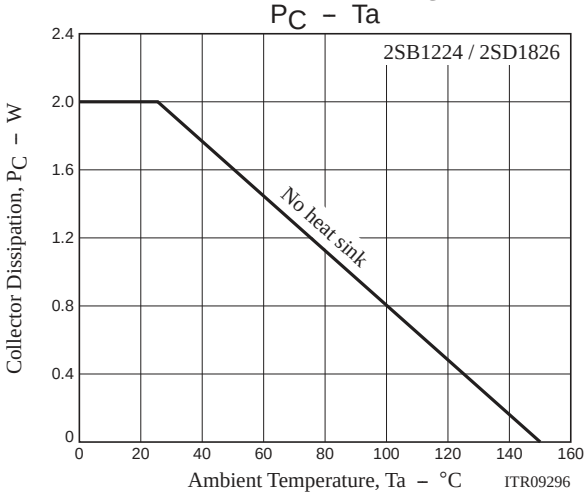

VCE(sat) – IC
2SD1826
IC / IB=500
Ta= –40°C
25°C
120°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR09291

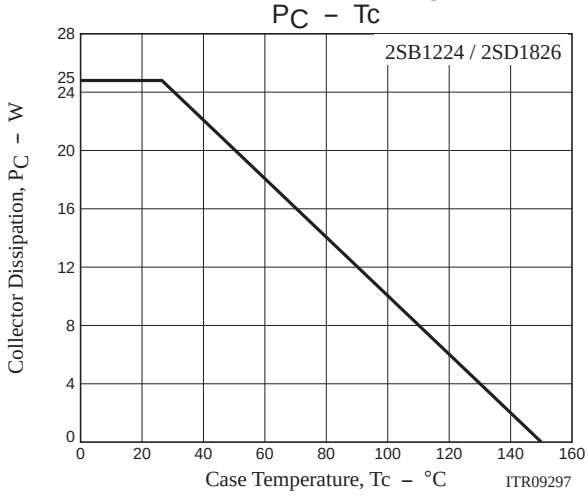

VBE(sat) – IC
2SB1224
IC / IB=500
Ta= –40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
ITR09292


VBE(sat) – IC
2SD1826
IC / IB=500
Ta= –40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
ITR09293


ASO
ICP=–10A
IC=–7A
2SB1224
Tc=25°C
DC operation
1ms
10ms
100ms
1ms to 100ms : Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09294


ASO
ICP=10A
IC=7A
2SD1826
Tc=25°C
DC operation
1ms
10ms
100ms
1ms to 100ms : Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09295


PC – Ta
2SB1224 / 2SD1826
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
ITR09296


PC – Tc
2SB1224 / 2SD1826
Collector Dissipation, PC – W
Case Temperature, Tc – °C
ITR09297