



SANYO Semiconductors

DATA SHEET

~~2SB824 / 2SD1060~~ — ~~PNP~~ NPN Epitaxial Planar Silicon Transistors

50V / 5A Switching Applications

Applications

- Suitable for relay drivers, high-speed inverters, converters, and other general large-current switching.

Features

- Low collector-to-emitter saturation voltage : $V_{CE(sat)} = (\approx)0.4V \text{ max} / I_C = (\approx)3A, I_B = (\approx)0.3A.$

Specifications ~~(-) : 2SB824~~

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		$(\approx)60$	V
Collector-to-Emitter Voltage	V_{CEO}		$(\approx)50$	V
Emitter-to-Base Voltage	V_{EBO}		$(\approx)6$	V
Collector Current	I_C		$(\approx)5$	A
Collector Current (Pulse)	I_{CP}		$(\approx)9$	A
Collector Dissipation	P_C		1.75	W
		$T_c = 25^\circ\text{C}$	30	W
Junction Temperature	T_J		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB} = (\approx)40V, I_E = 0A$			$(\approx)0.1$	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = (\approx)4V, I_C = 0A$			$(\approx)0.1$	mA

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Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	h_{FE1}	$V_{CE} = (\pm)2V, I_C = (\pm)1A$	70*		280*	
	h_{FE2}	$V_{CE} = (\pm)2V, I_C = (\pm)3A$	30			
Gain-Bandwidth Product	f_T	$V_{CE} = (\pm)5V, I_C = (\pm)1A$		30		MHz
Output Capacitance	C_{ob}	$V_{CB} = (\pm)10V, f = 1MHz$		(160)100		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (\pm)3A, I_B = (\pm)0.3A$			(\pm)0.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (\pm)1mA, I_E = 0A$	(\pm)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (\pm)1mA, R_{BE} = \infty$	(\pm)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (\pm)1mA, I_C = 0A$	(\pm)6			V
Turn-ON Time	t_{on}	See specified Test Circuit.		0.1		μs
Storage Time	t_{stg}	See specified Test Circuit.		(0.7)1.4		μs
Fall Time	t_f	See specified Test Circuit.		0.2		μs

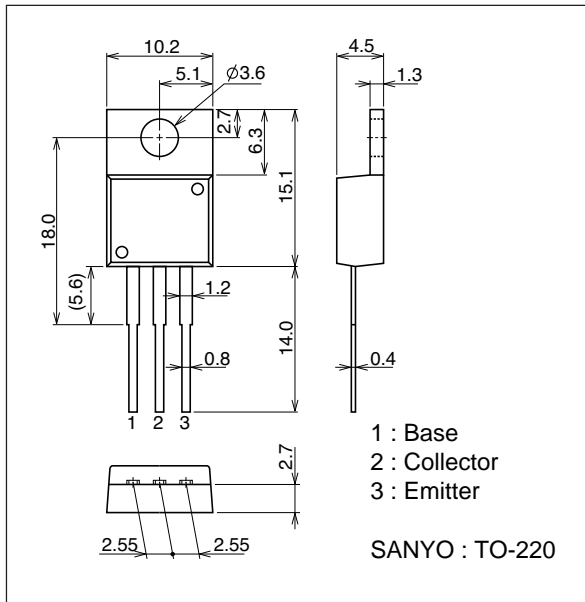
* : The 2SB824 / 2SD1060 are classified by 1A h_{FE} as follows :

Rank	Q	R	S
h_{FE}	70 to 140	100 to 200	140 to 280

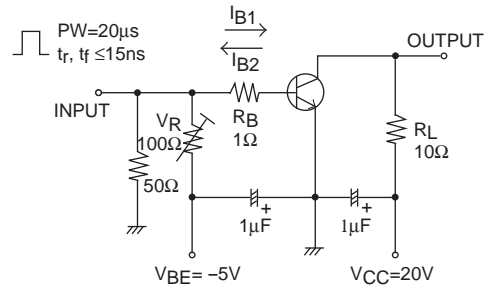
Package Dimensions

unit : mm (typ)

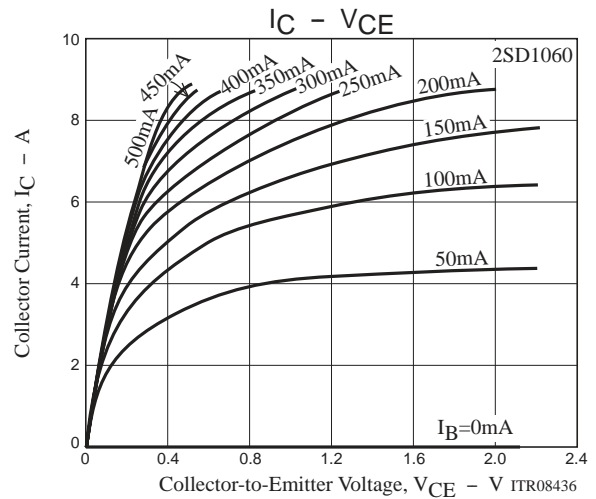
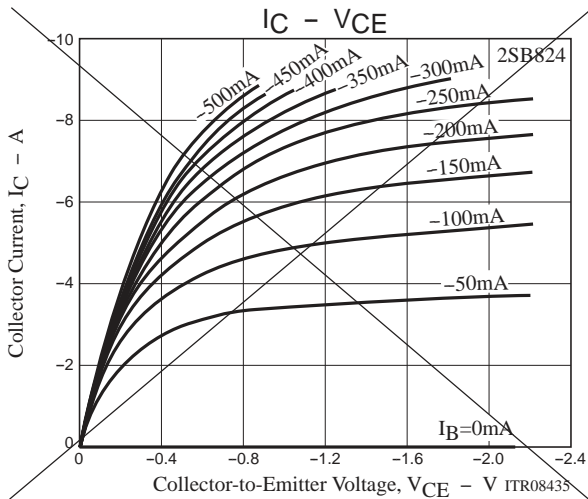
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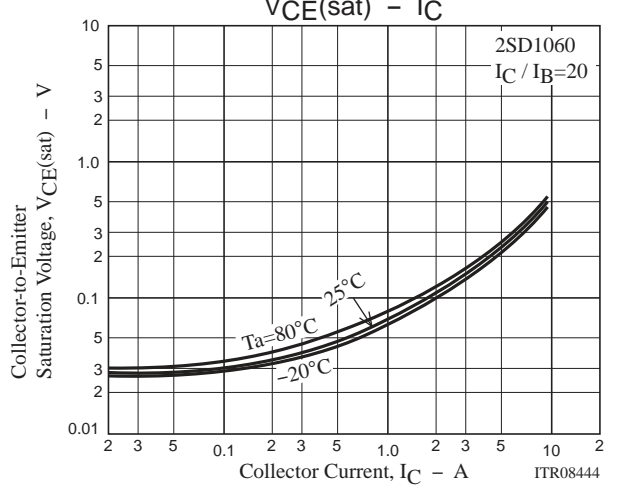
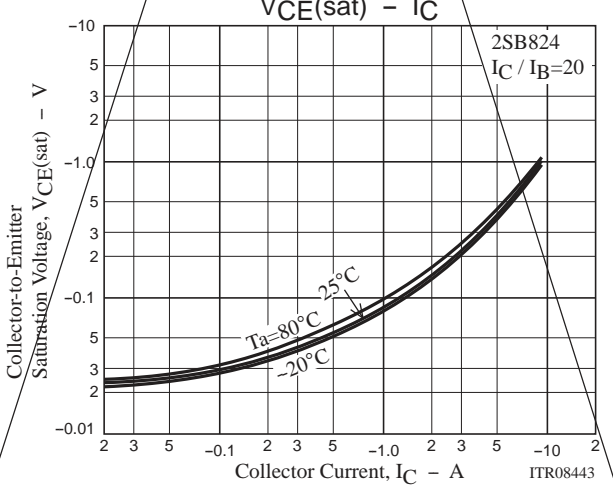
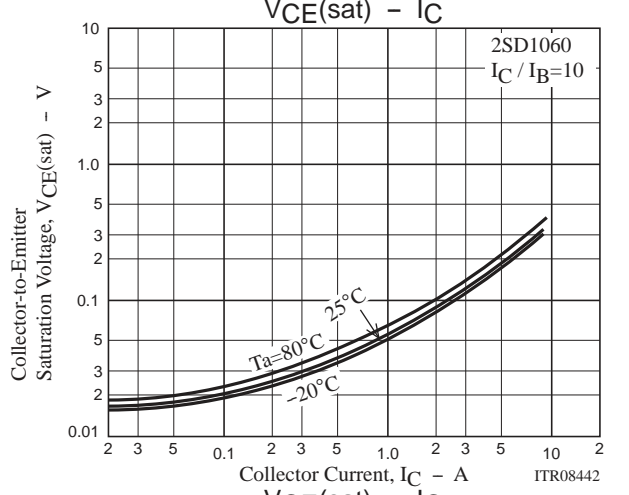
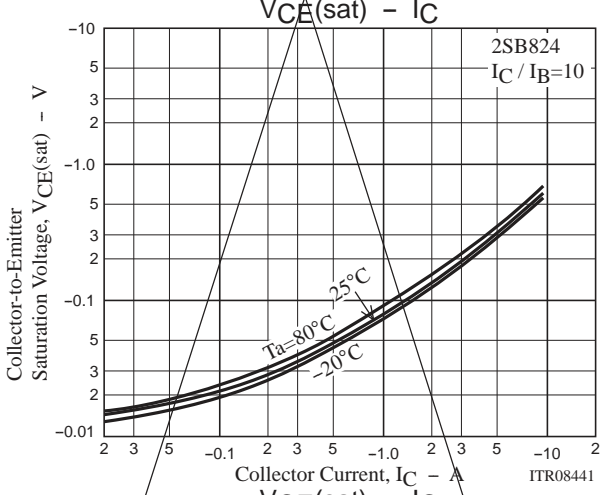
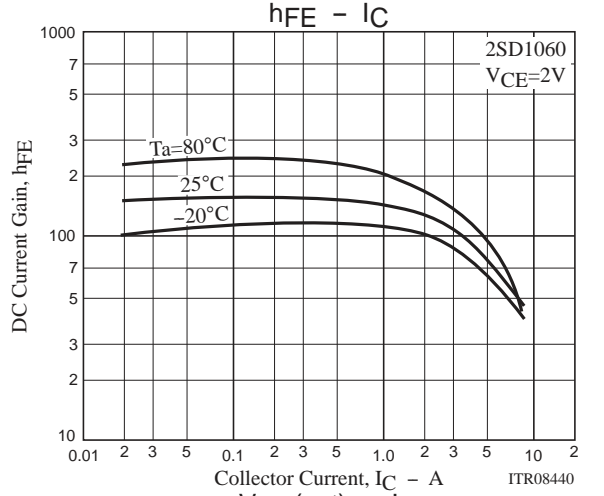
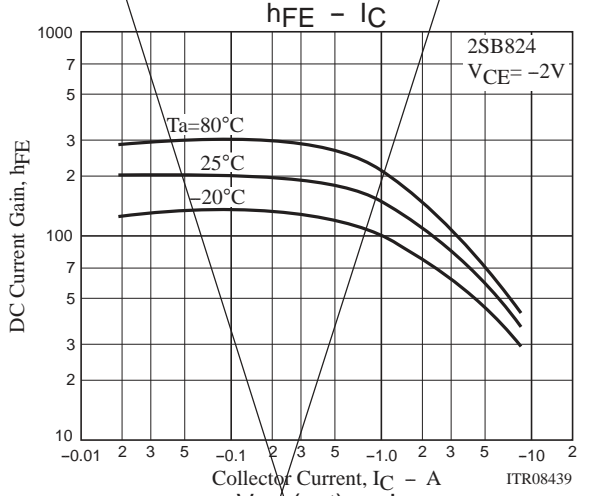
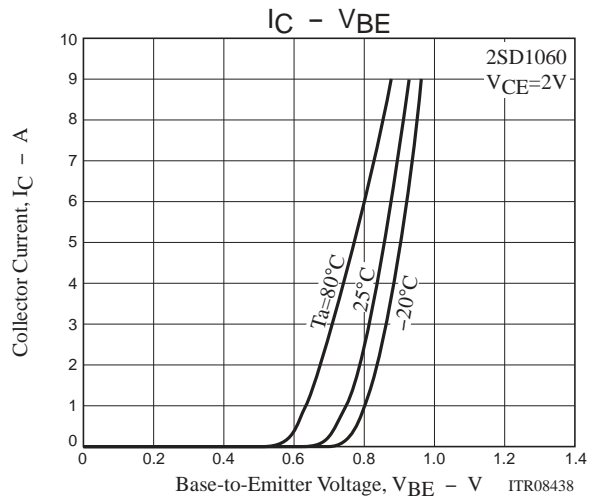
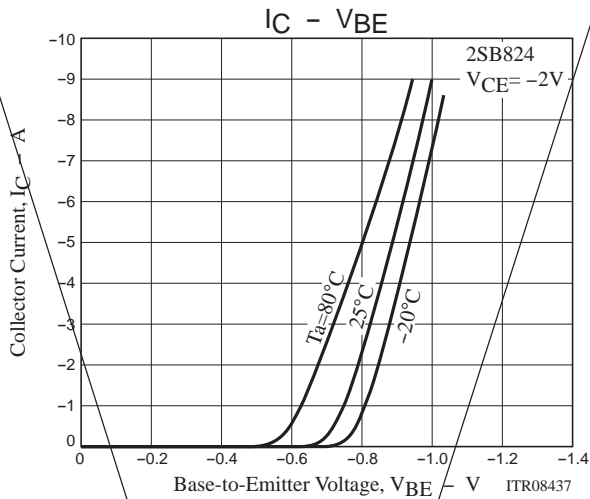
Switching Time Test Circuit



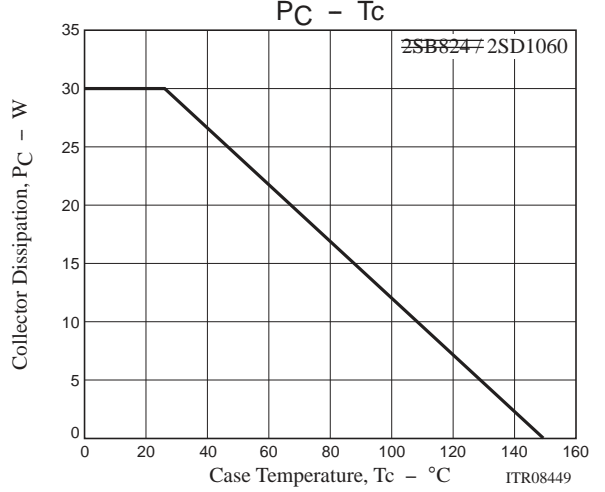
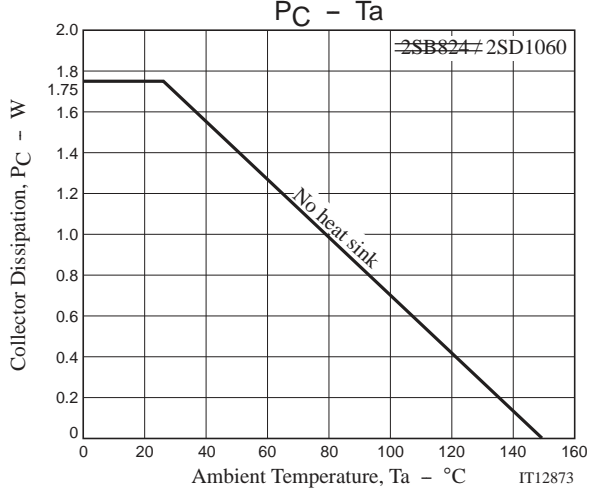
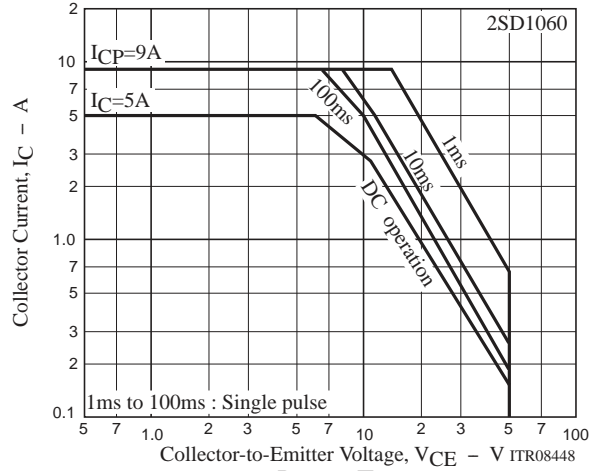
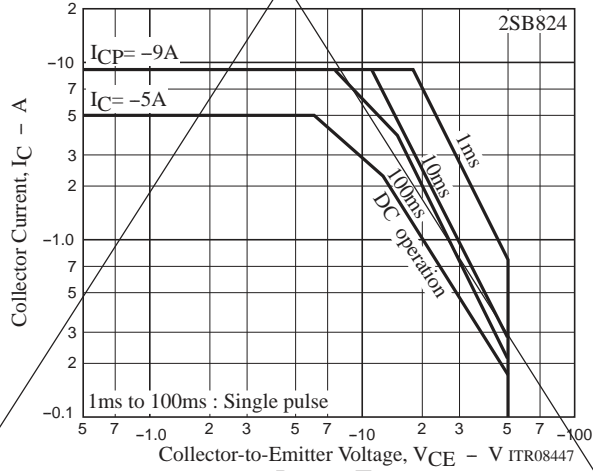
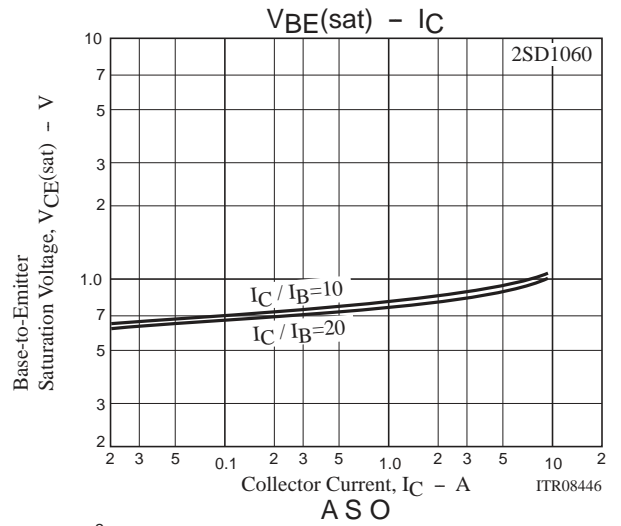
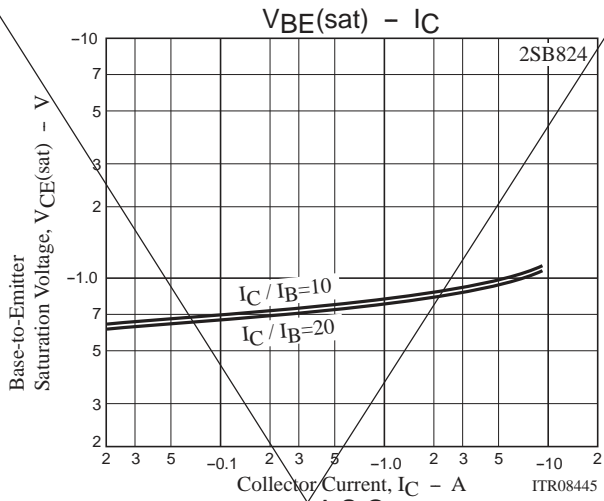
$I_C = 10I_{B1} = -10I_{B2} = 2A$
For PNP, the polarity is reversed.



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