Ordering number:EN3720

2SB1388 : PNP Epitaxial Planar Silicon Transistors
2SD2093 : NPN Triple Diffused Planar Silicon Transistors

2SB1388/2SD2093

Driver Applications

Applications

· Motor drivers, printer hammer drivers, relay drivers, voltage regulator control.

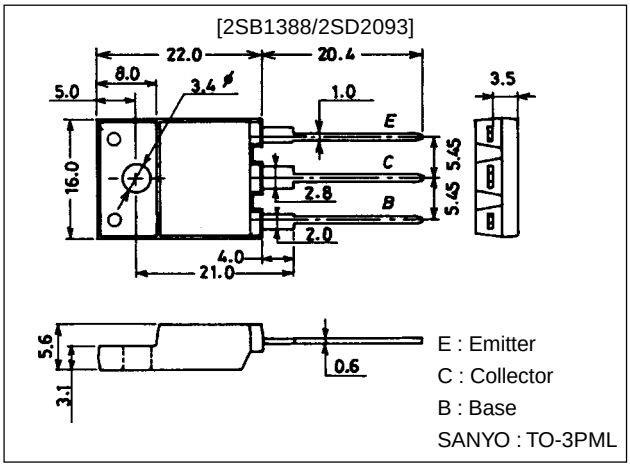
Features

· High DC current gain.
· Large current capacity and large ASO.
· Low saturation volatage.
· Micaless package facilitating mounting.

Package Dimensions

unit:mm

2039A



( ) : 2SB1388

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)110	V
Collector-to-Emitter Voltage	V_{CEO}		(–)100	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)10	A
Collector Current (Pulse)	I_{CP}		(–)15	A
Collector Dissipation	P_C		3.0	W
		Tc=25˚C	45	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}=(–)80V, I_E=0			(–)0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{CE}=(–)5V, I_C=0			(–)3.0	mA
DC Current Gain	h_{FE}	V_{CE}=(–)3V, I_C=(–)5A	1500	4000		
Gain-Bandwidth Product	f_T	V_{CE}=(–)5V, I_C=(–)5A		20		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)5A, I_B=(–)10mA		(–1.0)	(–)1.5	V
				0.9		V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)5A, I_B=(–)10mA			(–)2.0	V

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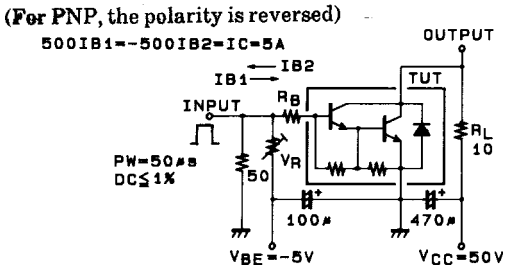
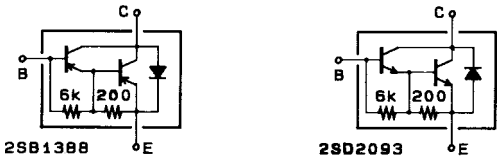
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)5mA, I_E=0	(–)110			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)50mA, R_{BE}=∞	(–)100			V
Turn-ON Time	t_{on}	See specified test circuit.		(0.7)		μs
				0.6		μs
Storage Time	t_{stg}	See specified test circuit.		(1.4)		μs
				4.8		μs
Fall Time	t_f	See specified test circuit.		(1.5)		μs
				1.6		μs

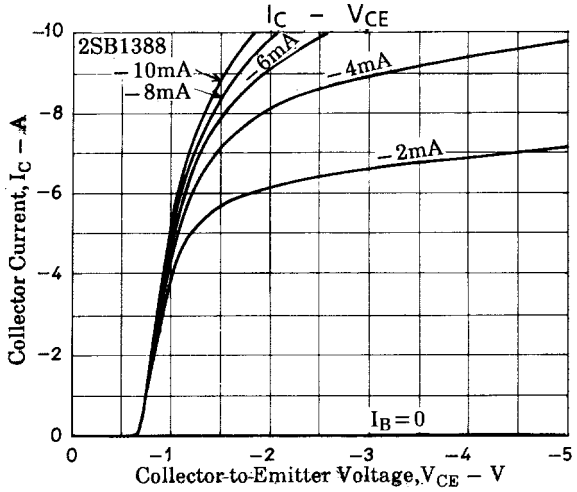
Switching Time Test Circuit

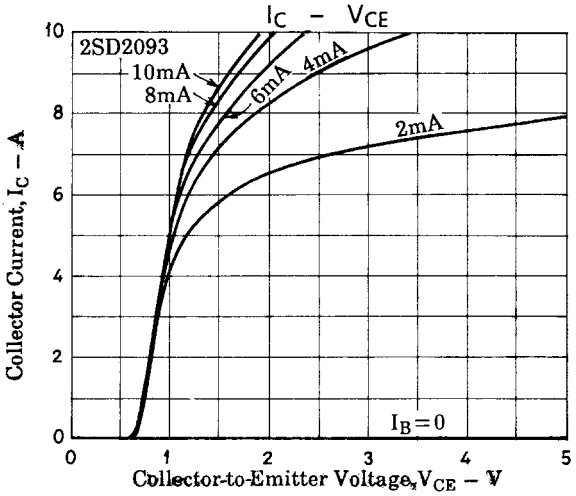


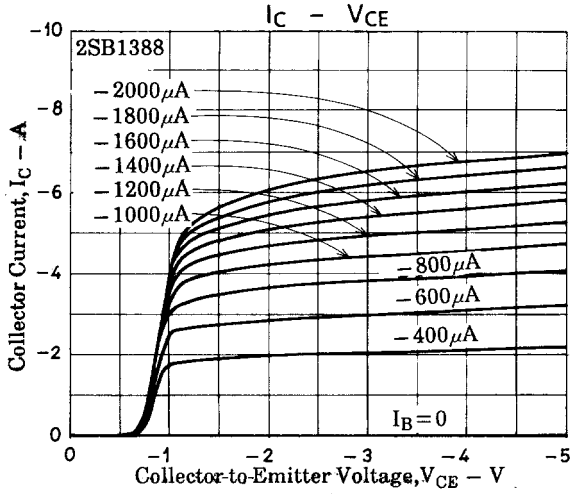
Electrical Connection

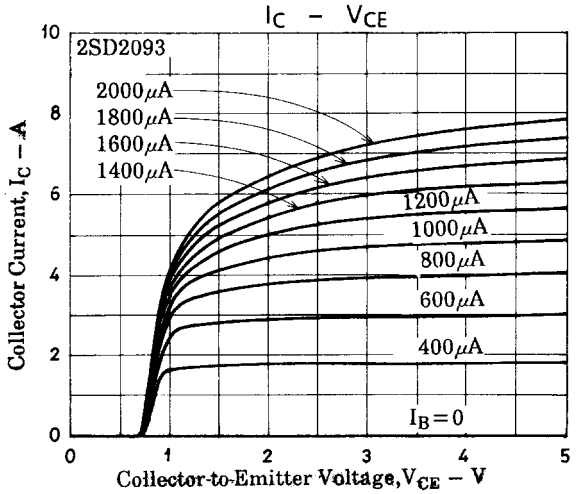


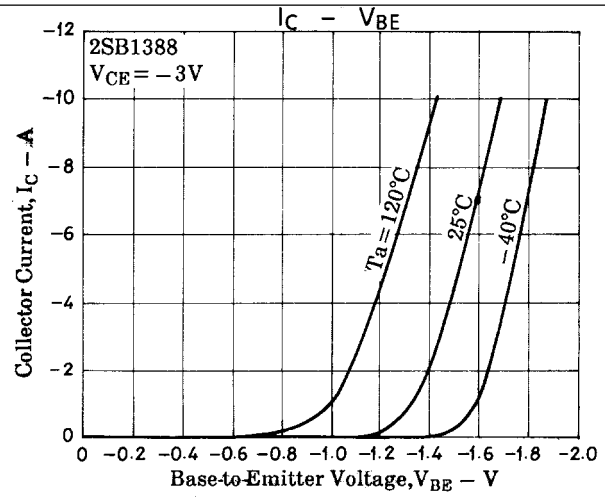
Unit (resistance : Ω, capacitance : F)

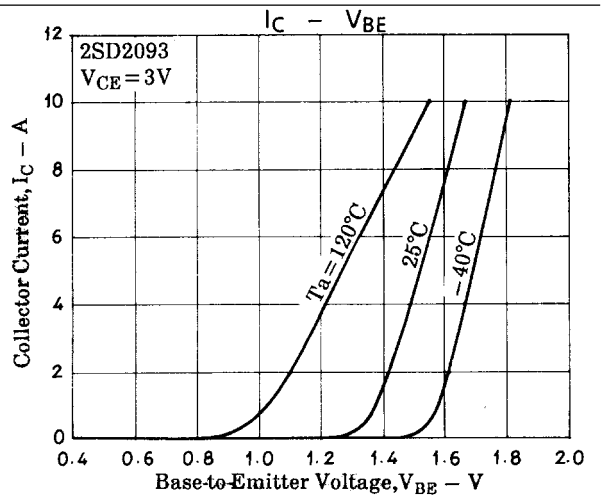


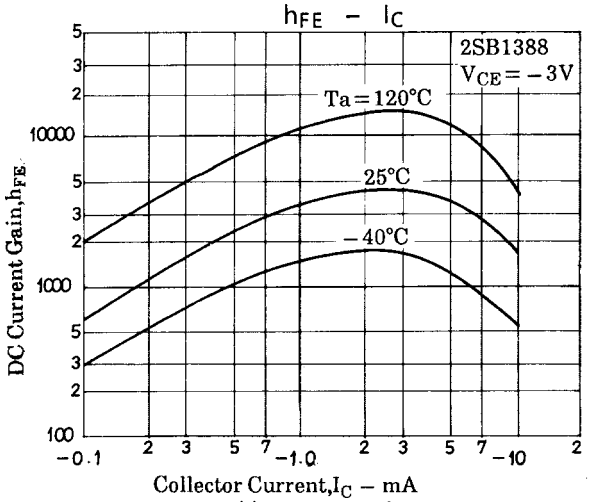


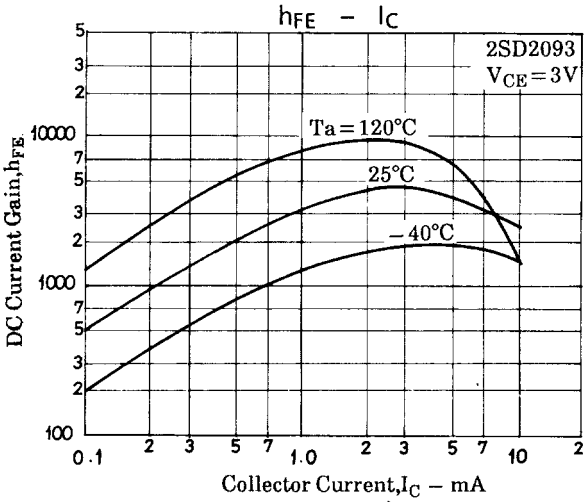


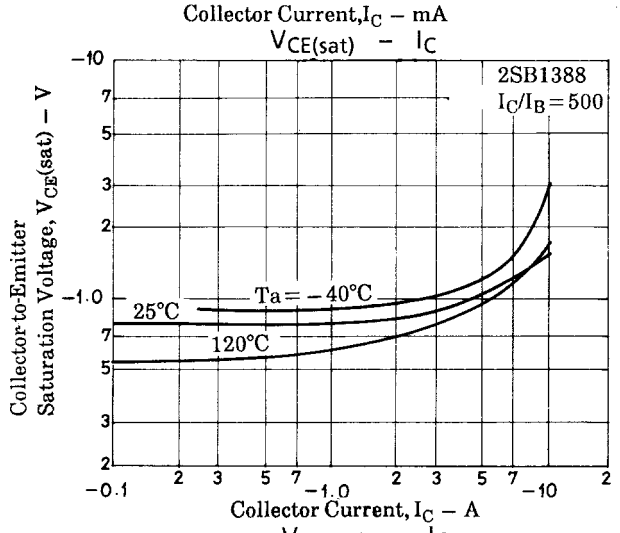


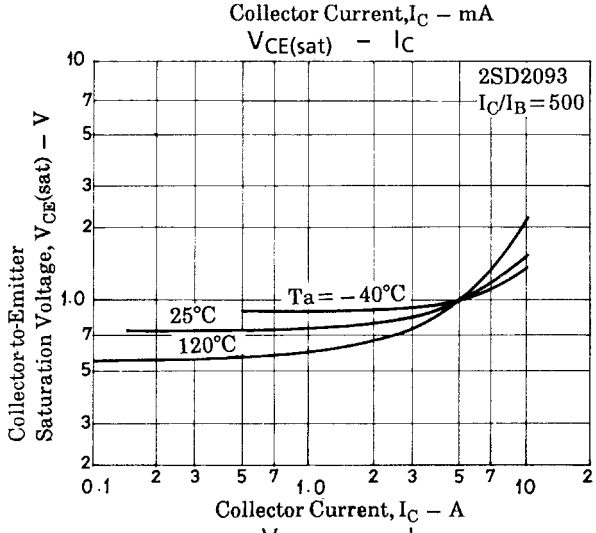

IC – VBE
2SB1388
VCE = –3V
Ta = 120°C
25°C
–40°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V

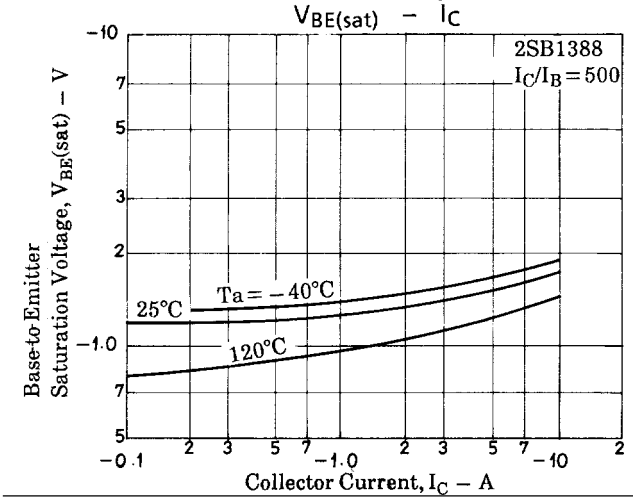

IC – VBE
2SD2093
VCE = 3V
Ta = 120°C
25°C
–40°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V

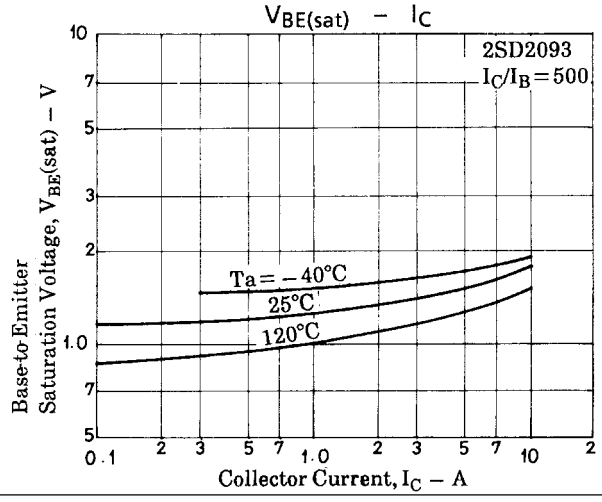

hFE – IC
2SB1388
VCE = –3V
Ta = 120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – mA


hFE – IC
2SD2093
VCE = 3V
Ta = 120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – mA


VCE(sat) – IC
2SB1388
IC/IB = 500
Ta = –40°C
25°C
120°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A


VCE(sat) – IC
2SD2093
IC/IB = 500
Ta = –40°C
25°C
120°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A


VBE(sat) – IC
2SB1388
IC/IB = 500
Ta = –40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A


VBE(sat) – IC
2SD2093
IC/IB = 500
Ta = –40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A