Ordering number : EN7988B

2SA2125/2SC5964

Bipolar Transistor
(–)50V, (–)3A, Low V_{CE}(sat), (PNP)NPN Single PCP

ON Semiconductor®
http://onsemi.com

Applicaitons
- DC / DC converter, relay drivers, lamp drivers, motor drivers, flash

Features
- Adoption of MBIT process
- Low collector to emitter saturation voltage
- Halogen free compliance
- Large current capacity
- High-speed switching

Specifications ( ) : 2SA2125

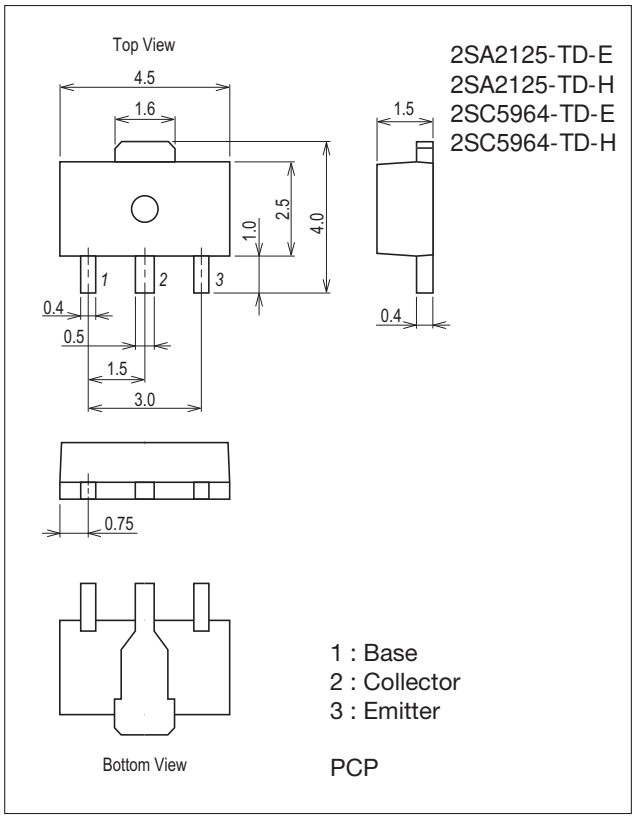
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	V_{CBO}		(-50)100	V
Collector to Emitter Voltage	V_{CES}		(-50)100	V
	V_{CEO}		(–)50	V
Emitter to Base Voltage	V_{EBO}		(–)6	V

Continued on next page.

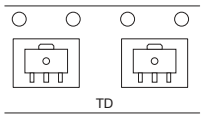
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions
unit : mm (typ)
7007B-004

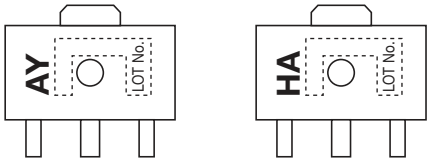


Product & Package Information
- Package : PCP
- JEITA, JEDEC : SC-62, SOT-89, TO-243
- Minimum Packing Quantity : 1,000 pcs./reel

Packing Type: TD



Marking



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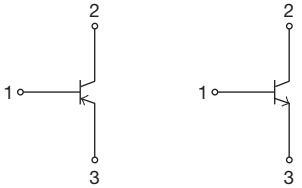
Electrical Connection



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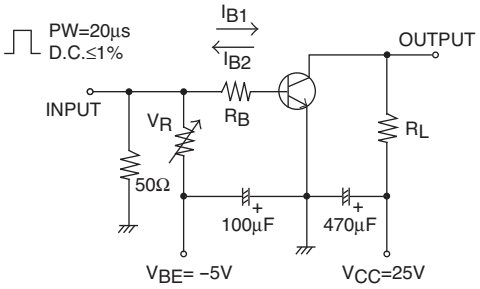
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
Collector Current	I_C		(–)3	A
Collector Current (Pulse)	I_{CP}		(–)6	A
Base Current	I_B		(–)600	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (250mm^2×0.8mm)	1.3	W
		Tc=25°C	3.5	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			(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0A			(–)1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)2V, I_C=(–)100mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)500mA		(390)380		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(24)13		pF
Collector to Emitter Saturation Voltage	V_{CE}(sat)1	I_C=(–)1A, I_B=(–)50mA		(–125)100	(–230)150	mV
	V_{CE}(sat)2	I_C=(–)2A, I_B=(–)100mA		(–250)190	(–500)290	mV
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_C=(–)2A, I_B=(–)100mA		(–)0.94	(–)1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0A	(–50)100			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=(–)100μA, R_{BE}=0Ω	(–50)100			V
	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0A	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit.		(30)35		ns
Storage Time	t_{stg}			(230)300		ns
Fall Time	t_f			(18)25		ns

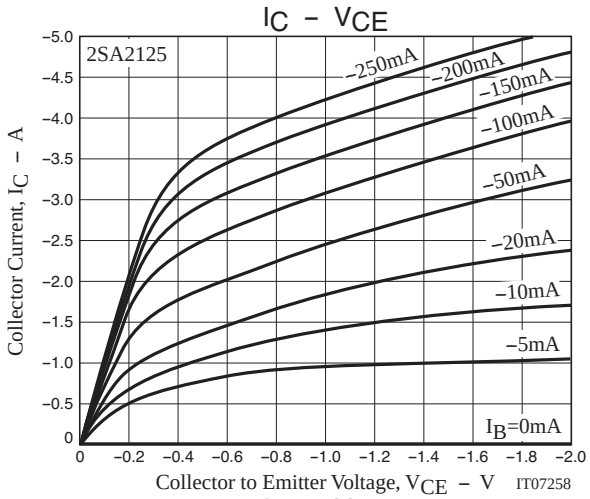
Switching Time Test Circuit

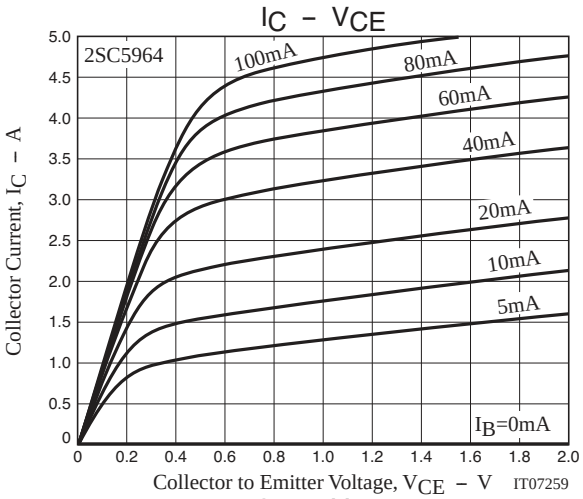


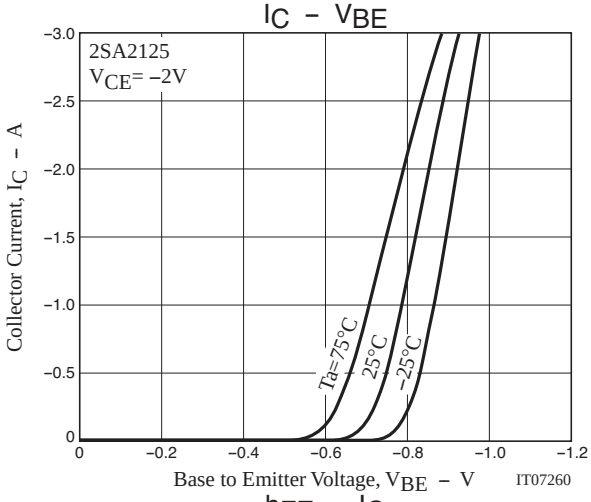
I_C=10I_{B1}= –10I_{B2}=1A
For PNP, the polarity is reversed.

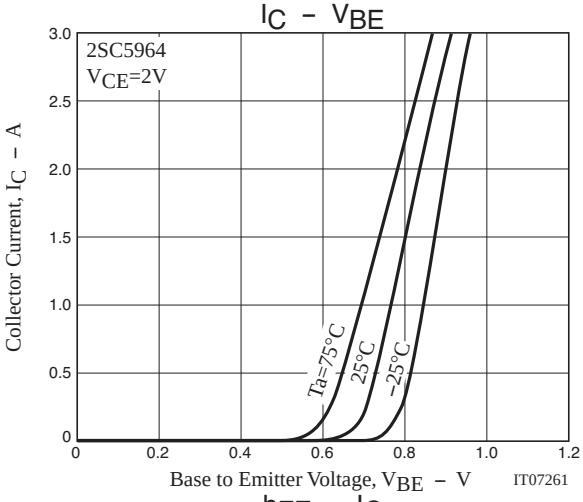
Ordering Information

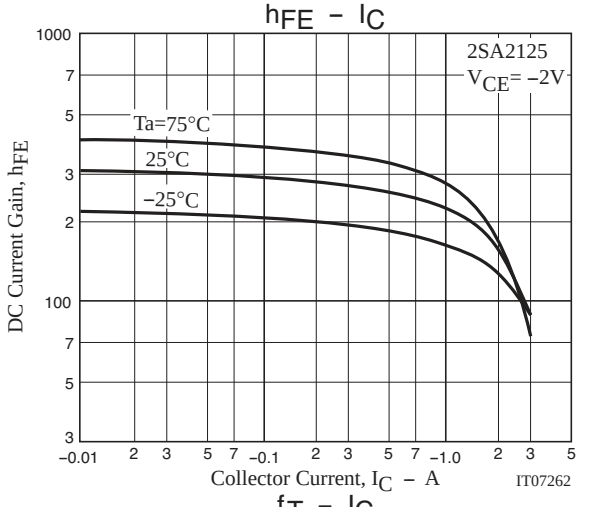
Device	Package	Shipping	memo
2SA2125-TD-E	PCP	1,000pcs./reel	Pb Free
2SA2125-TD-H	PCP	1,000pcs./reel	Pb Free and Halogen Free
2SC5964-TD-E	PCP	1,000pcs./reel	Pb Free
2SC5964-TD-H	PCP	1,000pcs./reel	Pb Free and Halogen Free

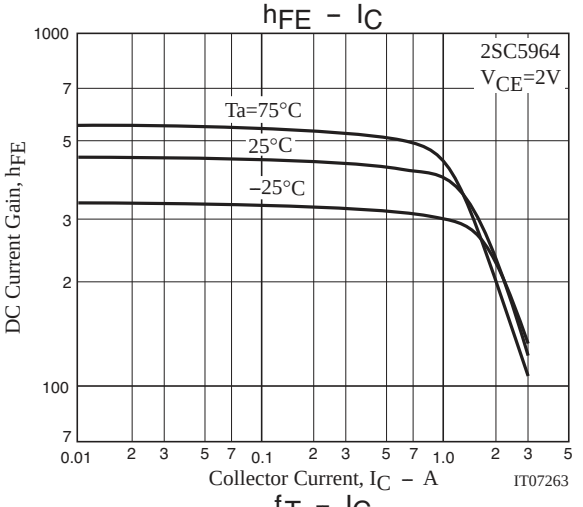

IC – VCE
2SA2125
–250mA
–200mA
–150mA
–100mA
–50mA
–20mA
–10mA
–5mA
IB=0mA
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
IT07258

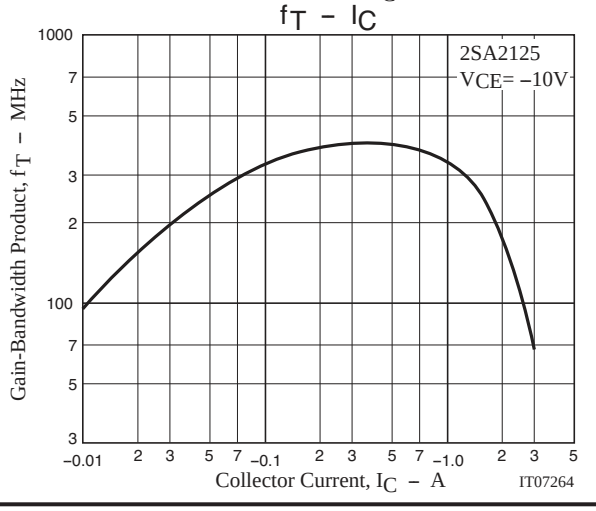

IC – VCE
2SC5964
100mA
80mA
60mA
40mA
20mA
10mA
5mA
IB=0mA
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
IT07259

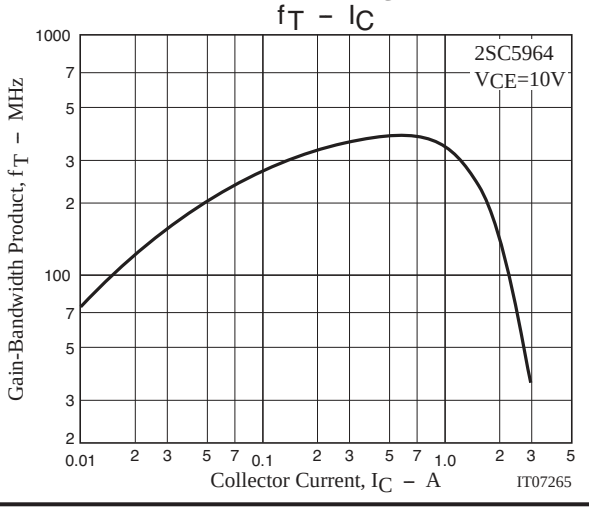

IC – VBE
2SA2125
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base to Emitter Voltage, VBE – V
IT07260

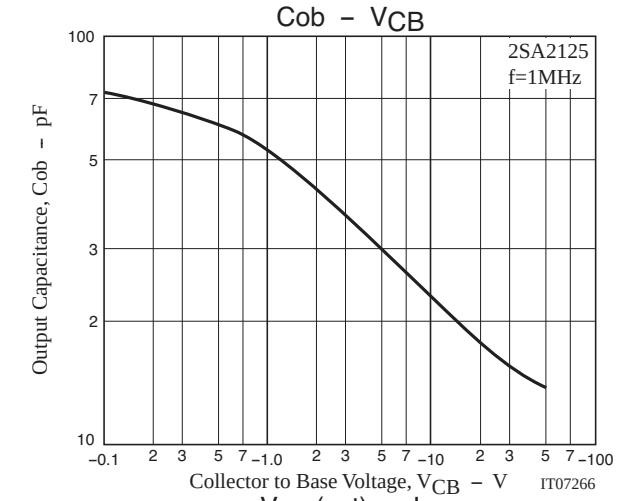

IC – VBE
2SC5964
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base to Emitter Voltage, VBE – V
IT07261

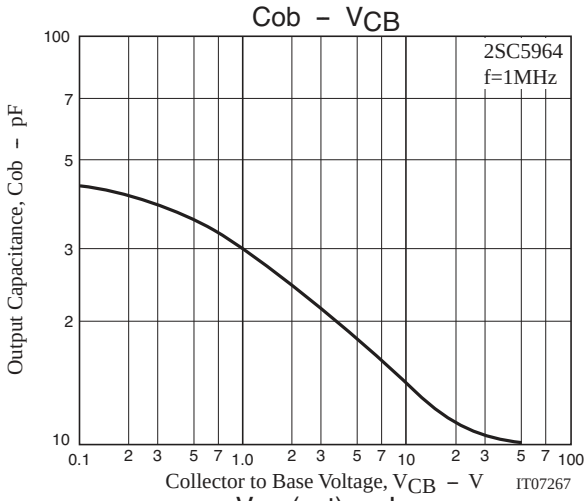

hFE – IC
2SA2125
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT07262

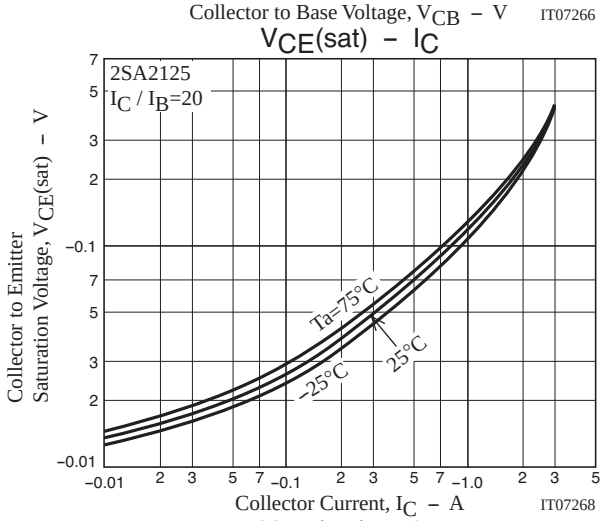

hFE – IC
2SC5964
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT07263

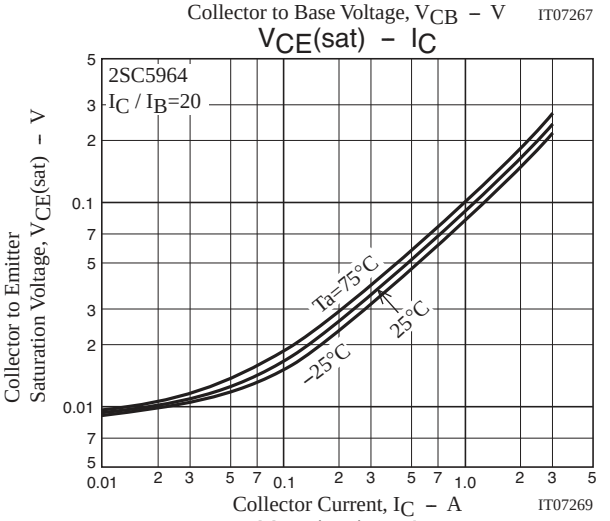

fT – IC
2SA2125
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT07264

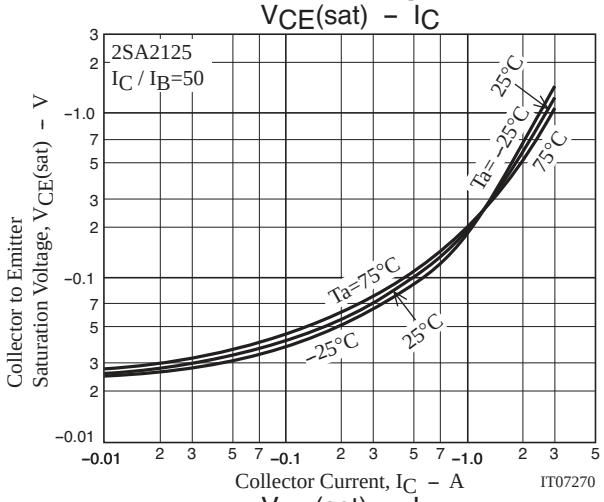

fT – IC
2SC5964
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT07265

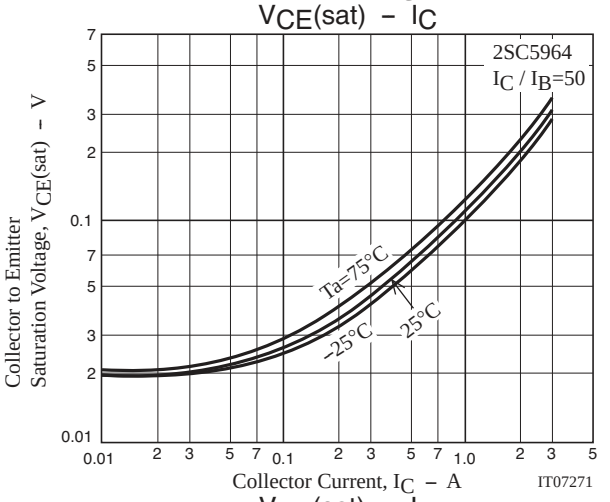

Cob – VCB
2SA2125
f=1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V
IT07266

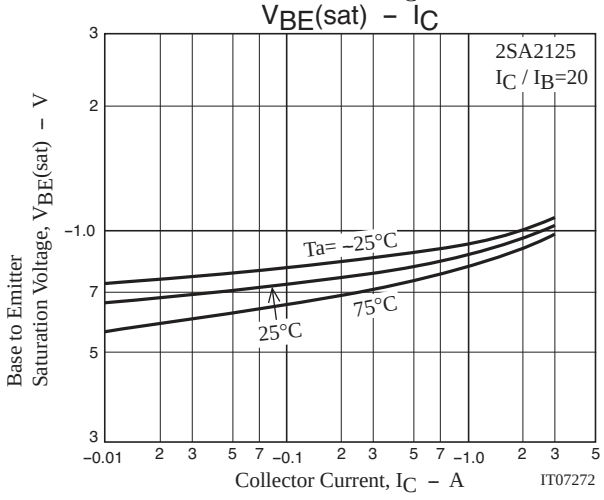

Cob – VCB
2SC5964
f=1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V
IT07267

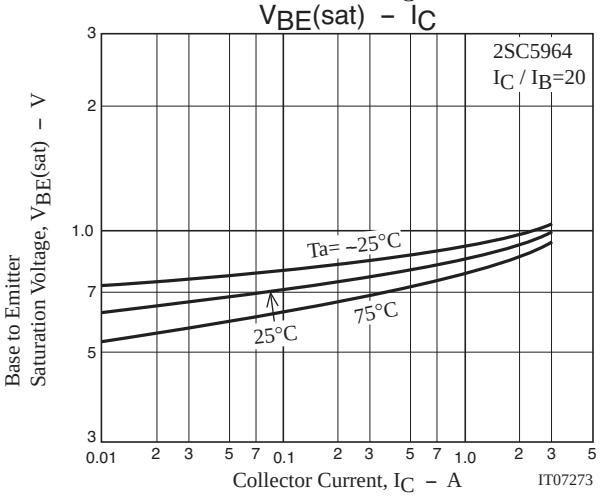

VCE(sat) – IC
2SA2125
IC / IB=20
Collector to Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
IT07268

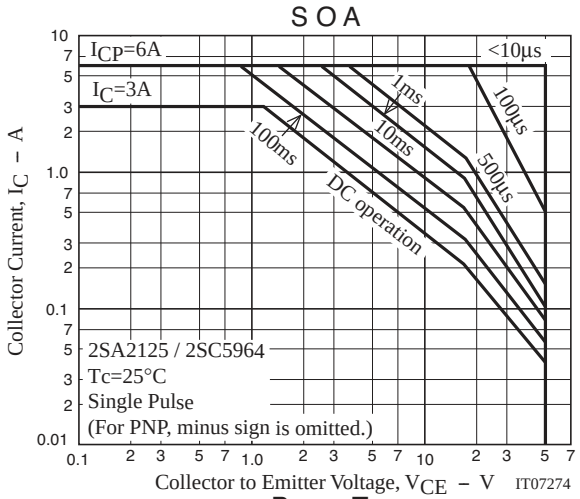

VCE(sat) – IC
2SC5964
IC / IB=20
Collector to Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
IT07269

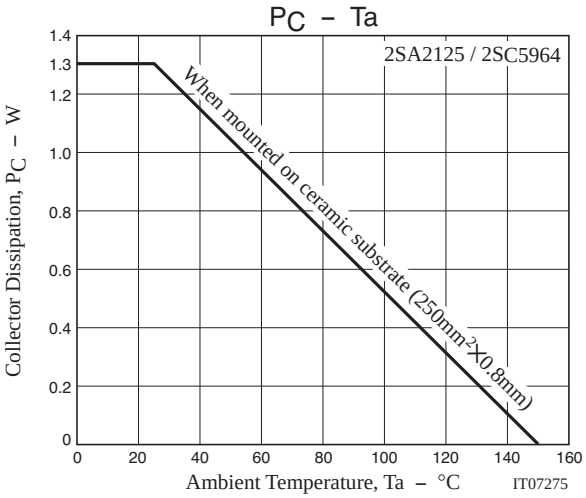

VCE(sat) – IC
2SA2125
IC / IB=50
Collector to Emitter Saturation Voltage, VCE(sat) – V
25°C
Ta= –25°C
75°C
Ta=75°C
25°C
–25°C
Collector Current, IC – A
IT07270

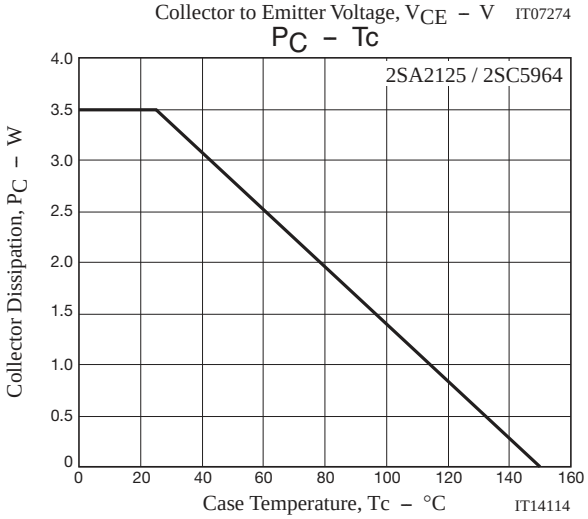

VCE(sat) – IC
2SC5964
IC / IB=50
Collector to Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
IT07271


VBE(sat) – IC
2SA2125
IC / IB=20
Base to Emitter Saturation Voltage, VBE(sat) – V
Ta= –25°C
75°C
25°C
Collector Current, IC – A
IT07272


VBE(sat) – IC
2SC5964
IC / IB=20
Base to Emitter Saturation Voltage, VBE(sat) – V
Ta= –25°C
75°C
25°C
Collector Current, IC – A
IT07273

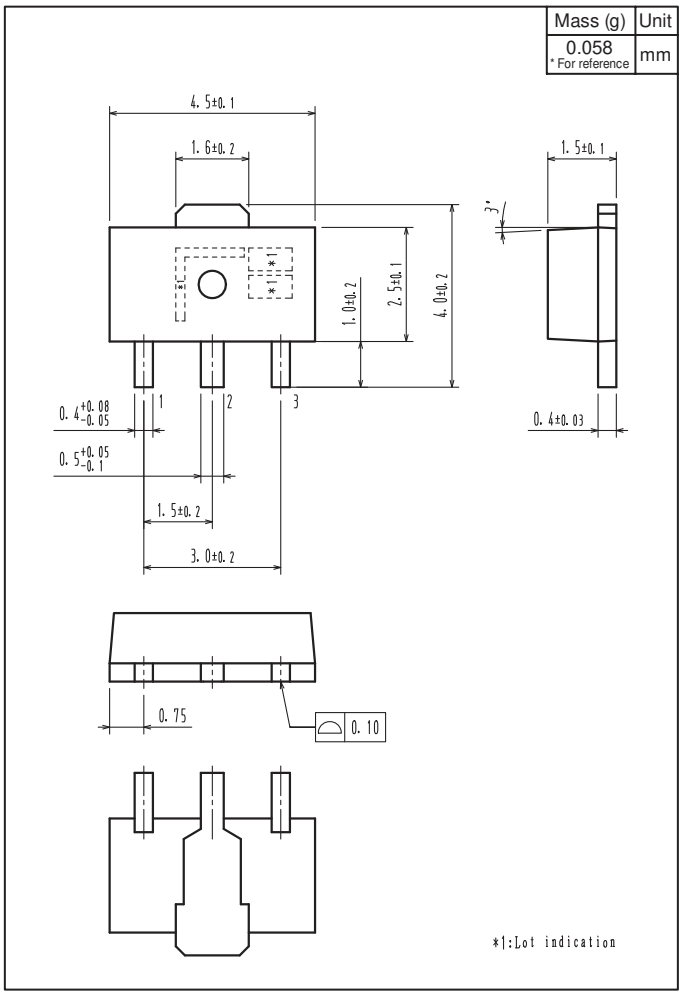

S O A
ICP=6A
IC=3A
<10µs
1ms
100µs
10ms
500µs
100ms
DC operation
2SA2125 / 2SC5964
Tc=25°C
Single Pulse
(For PNP, minus sign is omitted.)
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
IT07274


PC – Ta
2SA2125 / 2SC5964
When mounted on ceramic substrate (250mm2×0.8mm)
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT07275


PC – Tc
2SA2125 / 2SC5964
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT14114

Outline Drawing

2SA2125-TD-E, 2SA2125-TD-H, 2SC5964-TD-E, 2SC5964-TD-H



Land Pattern Example