Ordering number : EN8950

SANYO Semiconductors
DATA SHEET

MCH6542 — PNP / NPN Epitaxial Planar Silicon Transistors
Push-Pull Circuit Applications

Applications

- MOSFET gate drivers, relay drivers, lamp drivers, motor drivers.

Features

- Composite type with a PNP transistor and an NPN transistor contained in one package facilitating high-density mounting.
- Ultrasmall package permitting applied sets to be small and slim.

Specifications ( ) : PNP

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-30)40	V
Collector-to-Emitter Voltage	V_{CEO}		(-)30	V
Emitter-to-Base Voltage	V_{EBO}		(-)5	V
Collector Current	I_C		(-)300	mA
Collector Current (Pulse)	I_{CP}		(-)900	mA
Collector Dissipation	P_C	Mounted on a ceramic board (600mm²×0.8m) 1unit	0.5	W
Total Power Dissipation	P_T	Mounted on a ceramic board (600mm²×0.8m)	0.55	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}=(-)30V, I_E=0A			(-)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0A			(-)100	nA
DC Current Gain	h_{FE}	V_{CE}=(-)2V, I_C=(-)10mA	(200)300		(500)800	
Gain-Bandwidth Product	f_T	V_{CE}=(-)10V, I_C=(-)50mA		(520)380		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(3)2.4		pF

Marking : EQ

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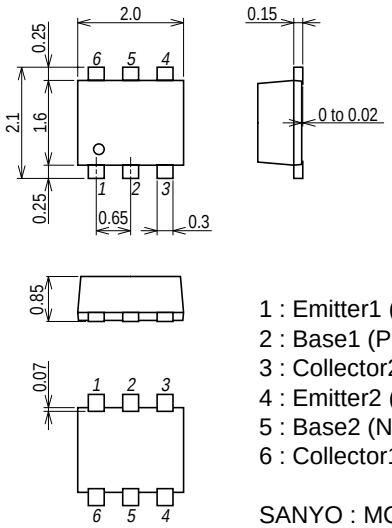
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(–)100mA, I_B=(–)5mA		(–110)100	(–220)200	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(–)100mA, I_B=(–)5mA		(–)0.9	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0A	(–30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0A	(–)5			V
Turn-On Time	t_{on}	See specified Test Circuit.		(39)42		ns
Storage Time	t_{stg}	See specified Test Circuit.		(200)135		ns
Fall Time	t_f	See specified Test Circuit.		(48)90		ns

Package Dimensions

unit : mm (typ)

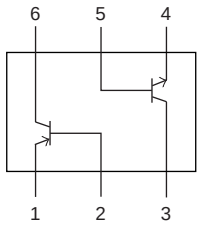
7022A-012



1 : Emitter1 (PNP TR)
2 : Base1 (PNP TR)
3 : Collector2 (NPN TR)
4 : Emitter2 (NPN TR)
5 : Base2 (NPN TR)
6 : Collector1 (PNP TR)

SANYO : MCPH6

Electrical Connection

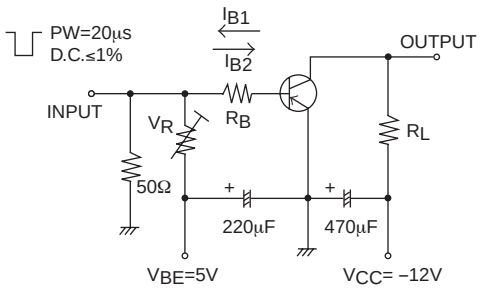


1 : Emitter1 (PNP TR)
2 : Base1 (PNP TR)
3 : Collector2 (NPN TR)
4 : Emitter2 (NPN TR)
5 : Base2 (NPN TR)
6 : Collector1 (PNP TR)

Top view

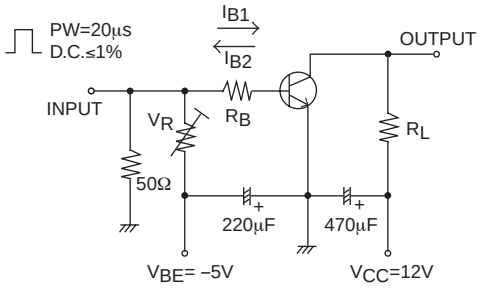
Switching Time Test Circuit

[PNP]

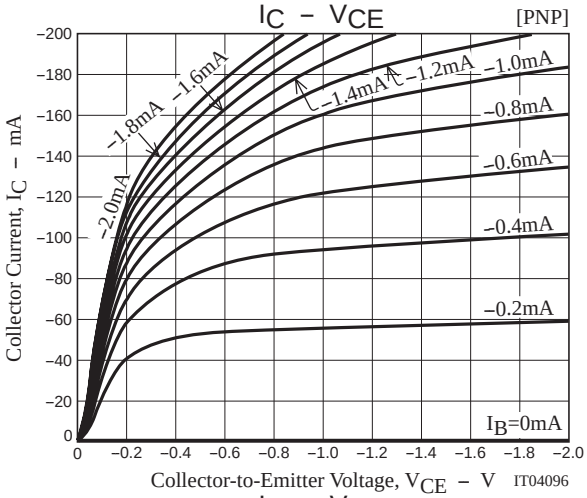


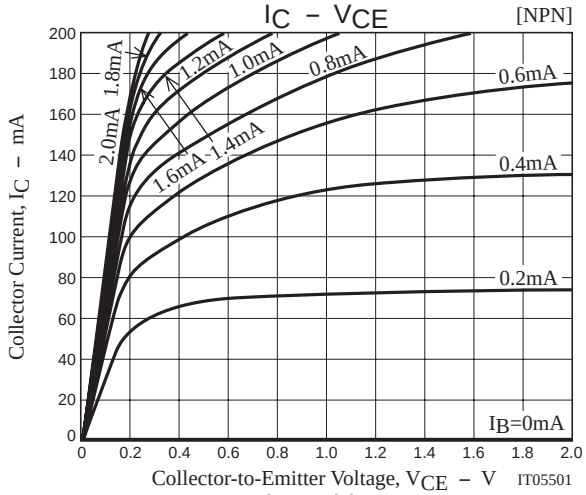
I_C=20I_{B1}= –20I_{B2}= –100mA

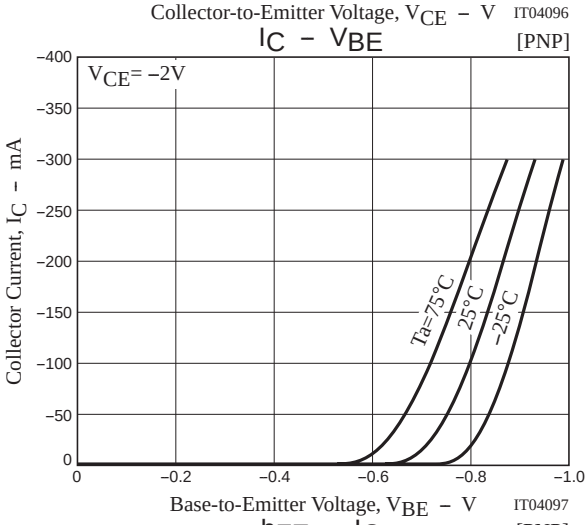
[NPN]

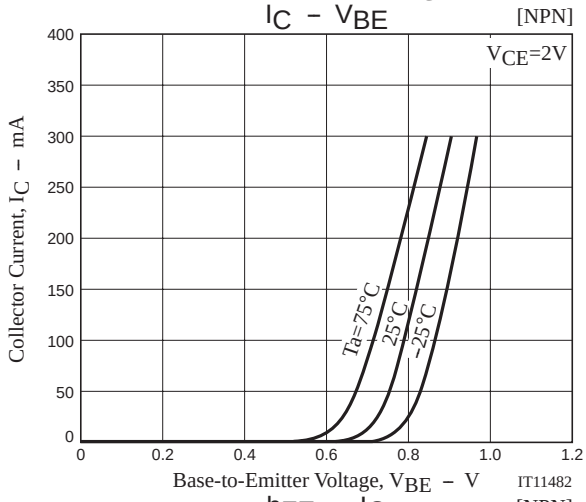


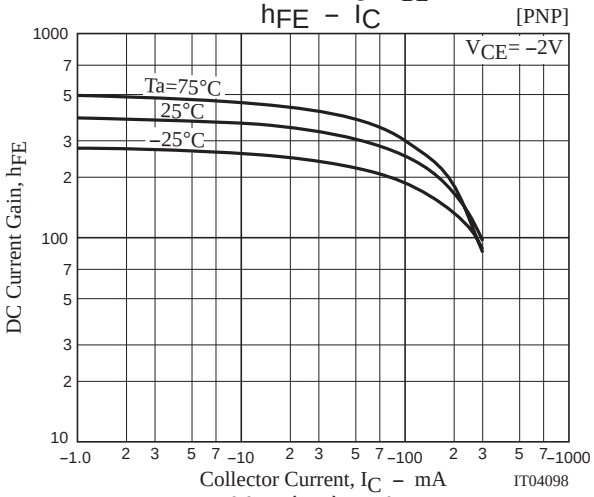
I_C=20I_{B1}= –20I_{B2}=300mA

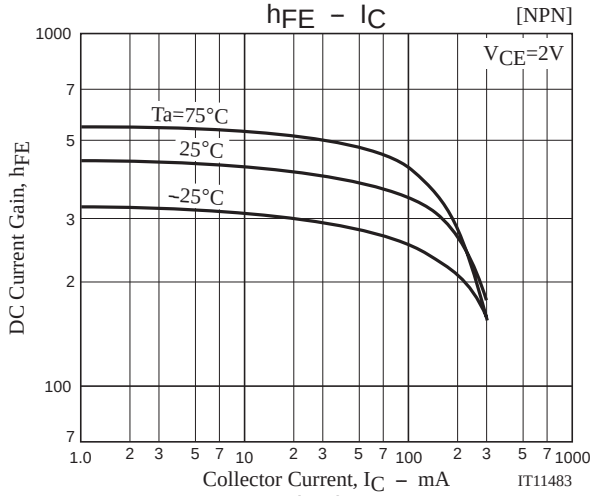

IC – VCE
[PNP]
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – V
IT04096
–2.0mA
–1.8mA
–1.6mA
–1.4mA
–1.2mA
–1.0mA
–0.8mA
–0.6mA
–0.4mA
–0.2mA
IB=0mA

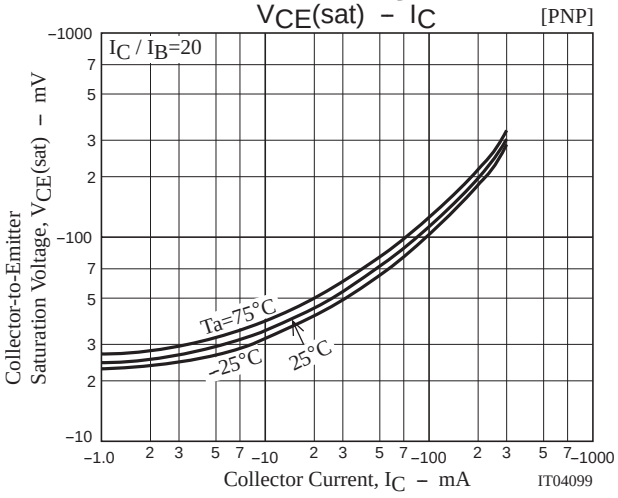

IC – VCE
[NPN]
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – V
IT05501
2.0mA
1.8mA
1.6mA
1.4mA
1.2mA
1.0mA
0.8mA
0.6mA
0.4mA
0.2mA
IB=0mA

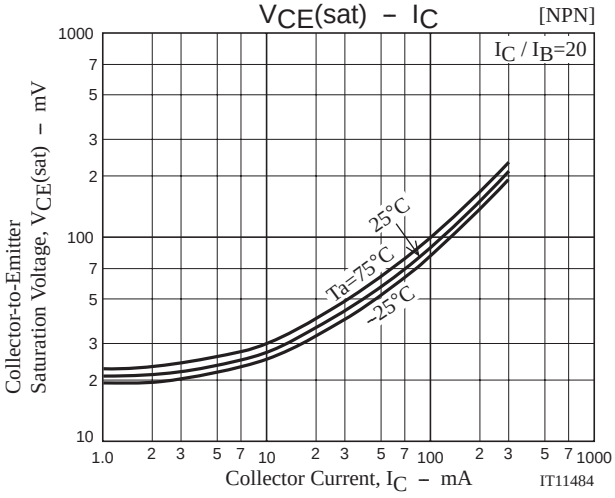

IC – VBE
[PNP]
VCE= –2V
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V
IT04097
Ta=75°C
25°C
–25°C

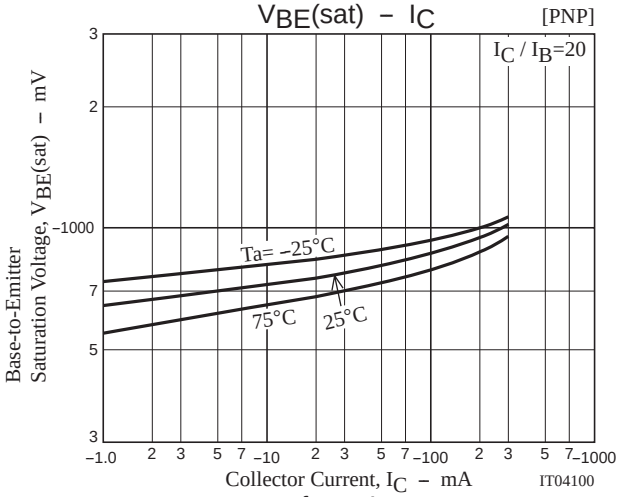

IC – VBE
[NPN]
VCE=2V
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V
IT11482
Ta=75°C
25°C
–25°C

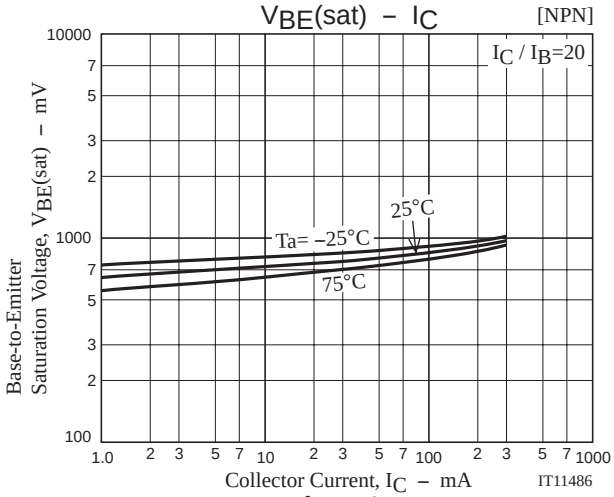

hFE – IC
[PNP]
VCE= –2V
DC Current Gain, hFE
Collector Current, IC – mA
IT04098
Ta=75°C
25°C
–25°C

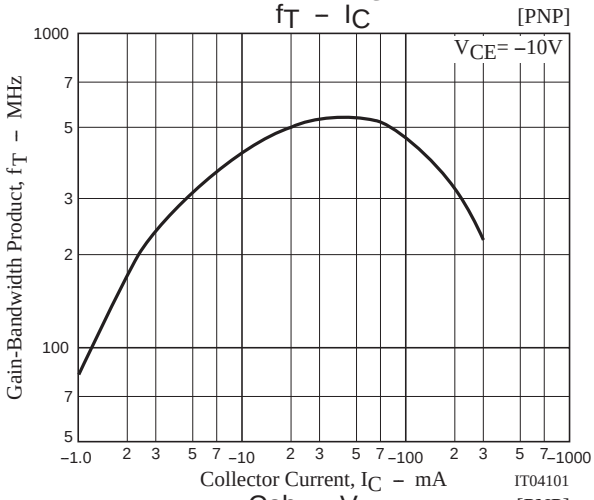

hFE – IC
[NPN]
VCE=2V
DC Current Gain, hFE
Collector Current, IC – mA
IT11483
Ta=75°C
25°C
–25°C

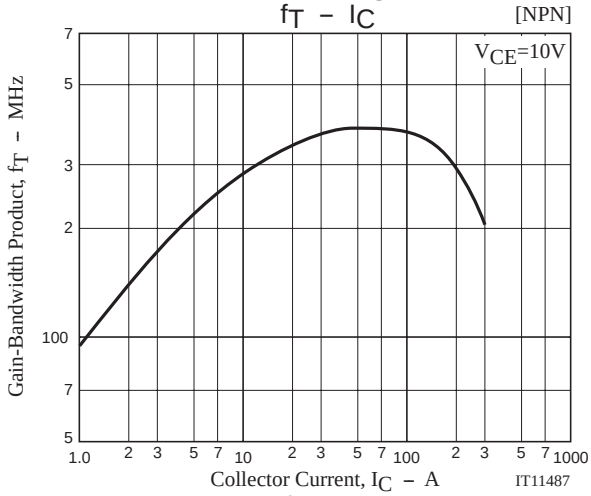

VCE(sat) – IC
[PNP]
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
IT04099
Ta=75°C
–25°C
25°C

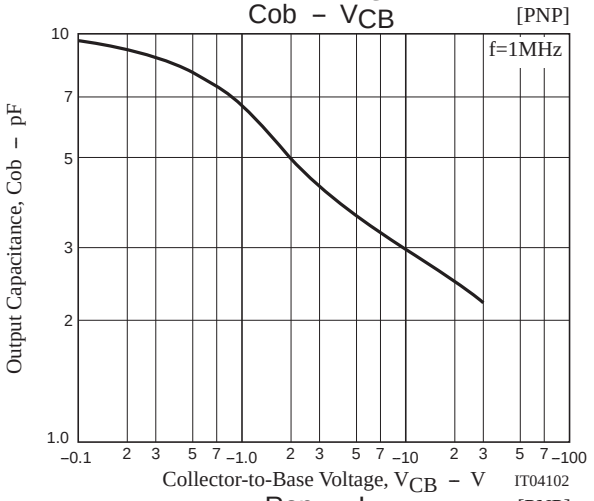

VCE(sat) – IC
[NPN]
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
IT11484
25°C
Ta=75°C
–25°C

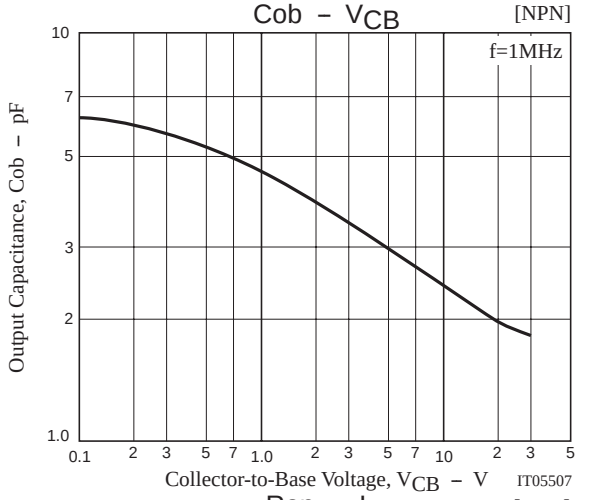

VBE(sat) – IC
[PNP]
IC / IB=20
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – mA
IT04100

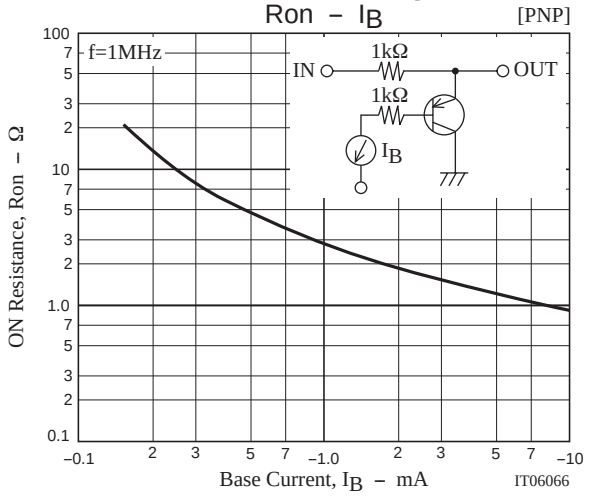

VBE(sat) – IC
[NPN]
IC / IB=20
25°C
Ta= –25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – mA
IT11486

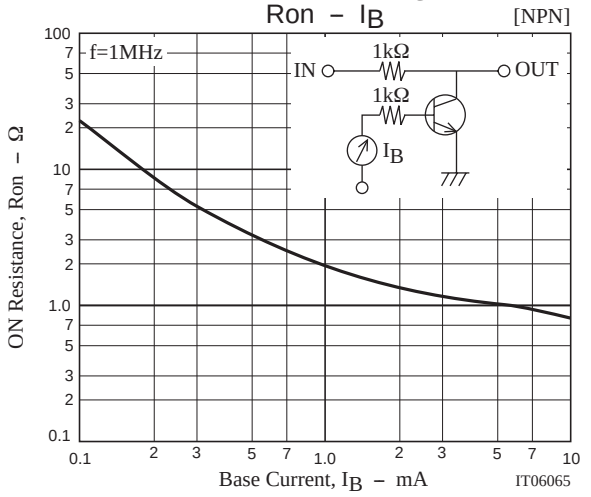

fT – IC
[PNP]
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
IT04101


fT – IC
[NPN]
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT11487


Cob – VCB
[PNP]
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04102


Cob – VCB
[NPN]
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT05507


Ron – IB
[PNP]
f=1MHz
IN
1kΩ
1kΩ
OUT
IB
ON Resistance, Ron – Ω
Base Current, IB – mA
IT06066


Ron – IB
[NPN]
f=1MHz
IN
1kΩ
1kΩ
OUT
IB
ON Resistance, Ron – Ω
Base Current, IB – mA
IT06065