CHENMKO ENTERPRISE CO.,LTD

Lead free devices

CHT4413UPNPT

SURFACE MOUNT
PNP&NPN Muti-Chip General Purpose Transistor

VOLTAGE 40 Volts CURRENT 600 mAmpere

APPLICATION

* AF input stages and driver applicationon equipment.
* Other general purpose applications.

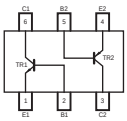
FEATURE

* Small surface mounting type. (SC-88/SOT-363)
* High current gain.
* Suitable for high packing density.
* Low colloector-emitter saturation.
* High saturation current capability.
* Two internal isolated PNP and NPN transistors in one package.

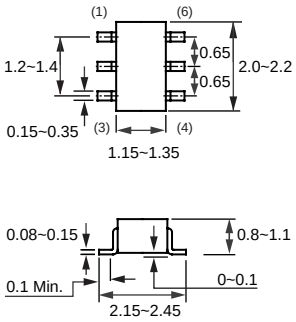
CONSTRUCTION

* PNP and NPN transistors in one package.

CIRCUIT



SC-88/SOT-363



Dimensions in millimeters

SC-88/SOT-363

TR1 CHT4401 LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	60	V
V_{CEO}	collector-emitter voltage	open base	–	40	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

2004-8

1. Transistor mounted on an FR4 printed-circuit board.

TR2 CHT4403 LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	-40	V
V_{CEO}	collector-emitter voltage	open base	–	-40	V
V_{EBO}	emitter-base voltage	open collector	–	-5	V
I_C	collector current (DC)		–	-600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 2	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

2. Transistor mounted on an FR4 printed-circuit board.

TR1 CHT4401 CHARACTERISTICS

T_{amb} = 25 °C unless otherwise speciped.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = 100uA ; I_E = 0A	60	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I_C = 1mA ; I_B = 0A	40	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	I_E = 100uA ; I_C = 0A	6	–	V
I_{CEX}	collector cut-off current	$V_{EB(OFF)}$ = 0.4V ; V_{CE} = 35 V	–	100	nA
I_{BL}	base cut-off current	$V_{EB(OFF)}$ = 0.4V ; V_{CE} = 35 V	–	100	nA
h_{FE}	DC current gain	I_C = 100uA; V_{CE} = 1V I_C = 1 mA; V_{CE} = 1V I_C = 10 mA; V_{CE} = 1V I_C = 150 mA; V_{CE} = 1V I_C = 500 mA; V_{CE} = 2V	20 40 80 100 40	– – – 300 –	
V_{CEsat}	collector-emitter saturation	I_C = 150 mA; I_B = 15 mA I_C = 500 mA; I_B = 50 mA	– –	400 750	mV mV
V_{BEsat}	base-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA I_C = 500 mA; I_B = 50 mA	750 –	950 1200	mV mV
C_{cb}	output capacitance	V_{CB}=5.0V; f=1.0MHZ; I_E=0	–	6.5	pF
C_{eb}	input capacitance	V_{EB}=0.5V; f=1.0MHZ; I_C=0	–	30	pF
h_{ie}	input impedance	V_{CE}=10V; f=1.0KHZ; I_C=1.0mA	1.0	15	KΩ
h_{re}	voltage feedback ratio		0.1	8.0	$x10^{-4}$
h_{fe}	small signal current gain		40	500	
h_{oe}	output impedance		1.0	30	μS
f_T	transition frequency	I_C = 20 mA; V_{CE} = 10 V; f = 100 MHz	250	–	MHz
t_d	delay time	V_{CC}=30V; I_C=150mA $V_{BE(off)}$=2.0V; I_{B1}=15mA	–	15	nS
t_r	rise time		–	20	nS
t_s	storage time	V_{CC}=30V; I_C=150mA I_{B1}=I_{B2}=15mA	–	225	nS
t_f	fall time		–	30	nS

TR2 CHT4403 CHARACTERISTICS

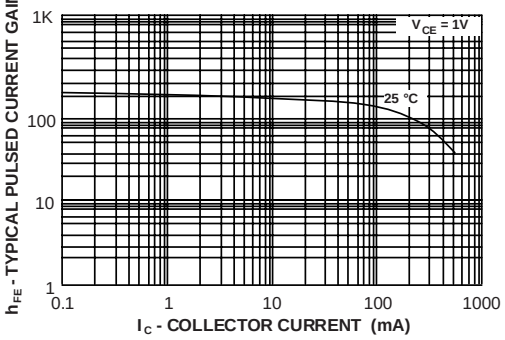
T_{amb} = 25 °C unless otherwise speciped.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = -100uA ; I_E = 0A	-40	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I_C = -1mA ; I_B = 0A	-40	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	I_E = -100uA ; I_C = 0A	-6	–	V
I_{CEX}	collector cut-off current	$V_{EB(OFF)}$ = -0.4V ; V_{CE} = -35 V	–	-100	nA
I_{BL}	base cut-off current	$V_{EB(OFF)}$ = -0.4V ; V_{CE} = -35 V	–	-100	nA
h_{FE}	DC current gain	I_C = -100uA; V_{CE} = -1V I_C = -1 mA; V_{CE} = -1V I_C = -10 mA; V_{CE} = -1V I_C = -150 mA; V_{CE} = -2V I_C = -500 mA; V_{CE} = -2V	30 60 100 100 20	– – – 300 –	
V_{CEsat}	collector-emitter saturation	I_C = -150 mA; I_B = -15 mA I_C = -500 mA; I_B = -50 mA	– –	-400 -750	mV mV
V_{BEsat}	base-emitter saturation voltage	I_C = -150 mA; I_B = -15 mA I_C = -500 mA; I_B = -50 mA	-750 –	-950 -1300	mV mV
C_{cb}	output capacitance	V_{CB}=-10V; f=1.0MHZ; I_E=0	–	8.5	pF
C_{eb}	input capacitance	V_{EB}=-0.5V; f=1.0MHZ; I_C=0	–	30	pF
h_{ie}	input impedance	V_{CE}=-10V; f=1.0KHZ; I_C=-1.0mA	1.5	15	KΩ
h_{re}	voltage feedback ratio		0.1	8.0	$x10^{-4}$
h_{fe}	small signal current gain		60	500	
h_{oe}	output impedance		1.0	100	μS
f_T	transition frequency	I_C = -20 mA; V_{CE} = - 10 V f = 100 MHz	200	–	MHz
t_d	delay time	V_{CC}=-30V; I_C=-150mA $V_{BE(off)}$=-2.0V; I_{B1}=-15mA	–	15	nS
t_r	rise time		–	20	nS
t_s	storage time	V_{CC}=-30V; I_C=-150mA I_{B1}=I_{B2}=-15mA	–	225	nS
t_f	fall time		–	30	nS

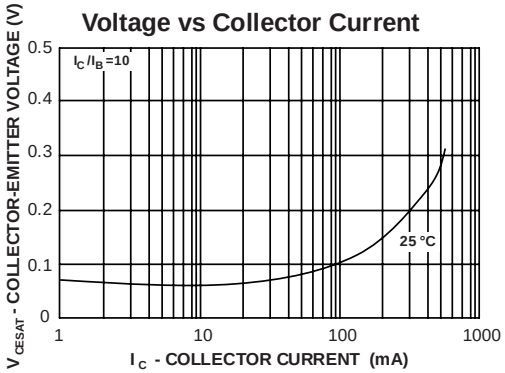
RATING CHARACTERISTIC CURVES (CHT4413UPNPT)

TR1 CHT4401 Typical Characteristics

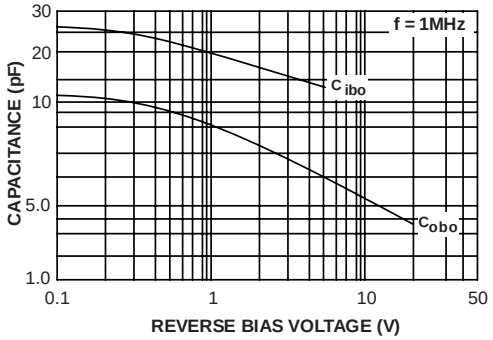
Typical DC Current Gain vs Collector Current



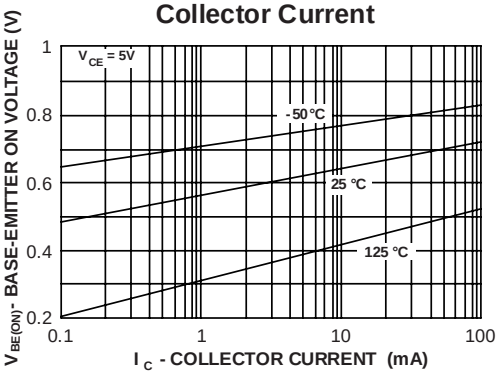
Collector-Emitter Saturation Voltage vs Collector Current



Typical Capacitance



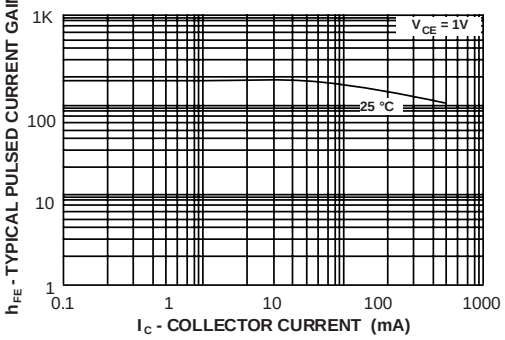
Base-Emitter ON Voltage vs Collector Current



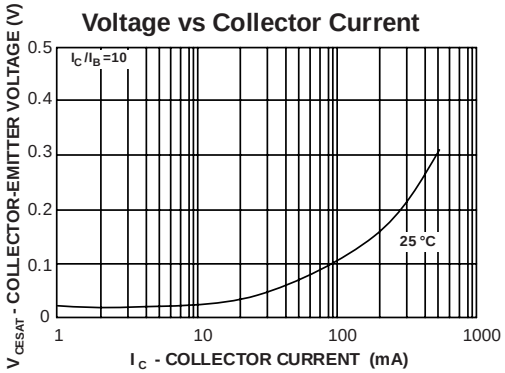
RATING CHARACTERISTIC CURVES (CHT4413UPNPT)

TR1 CHT4403 Typical Characteristics

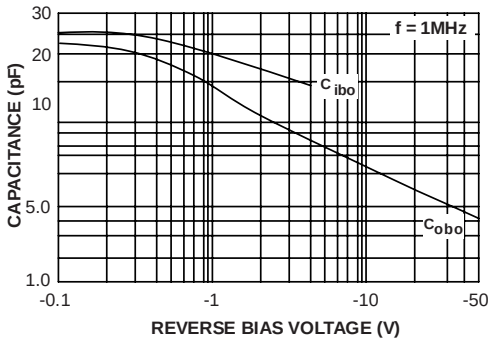
Typical DC Current Gain vs Collector Current



Collector-Emitter Saturation Voltage vs Collector Current



Typical Capacitance



Base-Emitter ON Voltage vs Collector Current