Ordering number:ENN1764B

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1405/2SC3599

Ultrahigh-Definition CRT Display Video Output Applications

Applications

- Ultrahigh-definition CRT display.
- Video output.
- Color TV chroma output.
- Wide-band amp.

Features

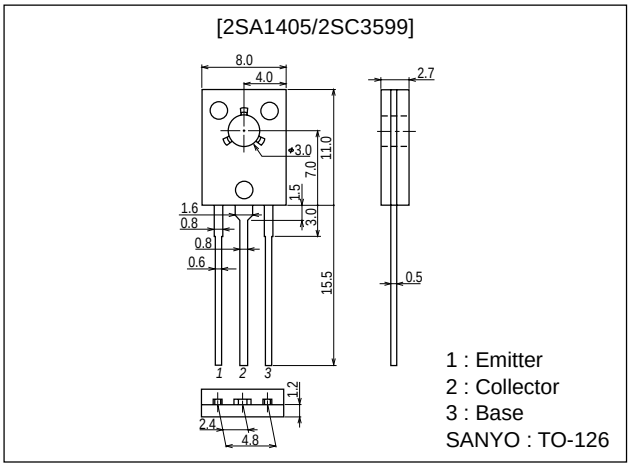
- High f_T : f_T typ=500MHz.
- High breakdown voltage : V_{CEO}≥120V.
- Small reverse transfer capacitance and excellent high-frequnecy characteristic
  : C_{re}=2.5pF (NPN), 3.8pF (PNP).
- Complementary pair with the 2SA1405/2SC3599.
- Adoption of FBET process.

( ) : 2SA1405

Package Dimensions

unit:mm

2009B



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)120	V
Collector-to-Emitter Voltage	V_{CEO}		(–)120	V
Emitter-to-Base Voltage	V_{EBO}		(–)4	V
Collector Current	I_C		(–)300	mA
Collector Current (Pulse)	I_{CP}		(–)600	mA
Collector Dissipation	P_C		1.2	W
		Tc=25˚C	8	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	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)2V, I_C=0			(–)1.0	μA
DC Current Gain	$h_{FE}1$	V_{CB}=(–)10V, I_C=(–)50mA	40*		320*	
	$h_{FE}2$	V_{CE}=(–)10V, I_C=250mA	20			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		500		MHz

* : The 2SA1405/2SC3599 are classified by 50mA h_{FE} as follows :

Continued on next page.

Rank	C	D	E	F
h_{FE}	40 to 80	60 to 120	100 to 200	160 to 320

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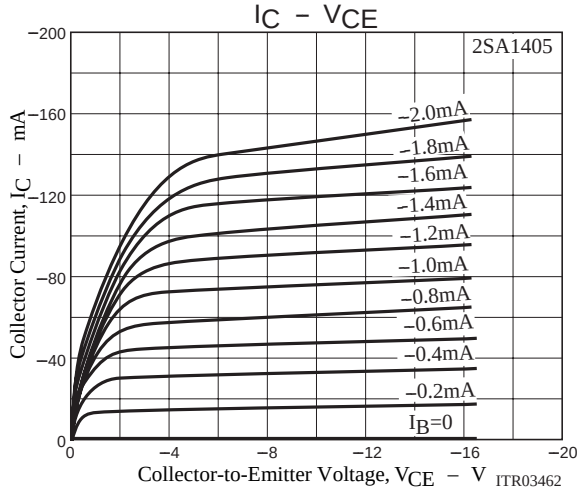
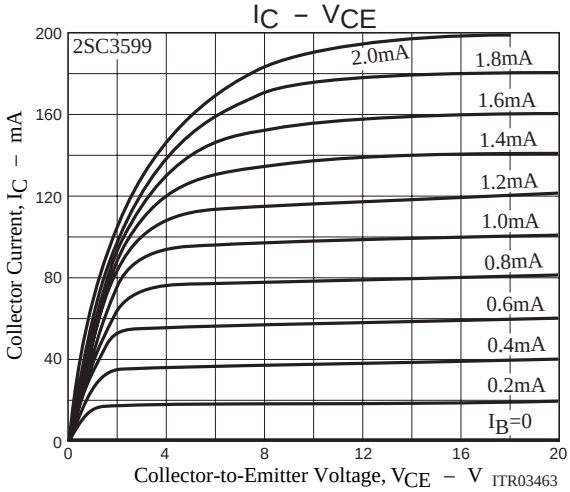
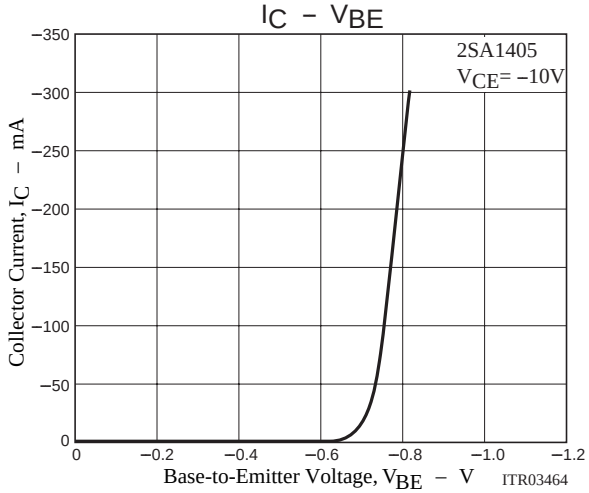
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

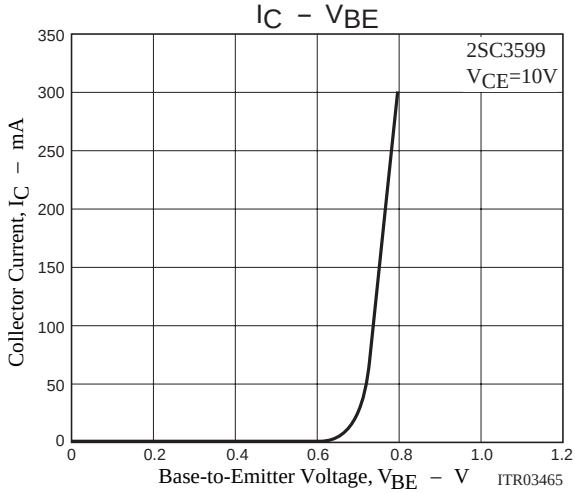
Continued from preceding page.

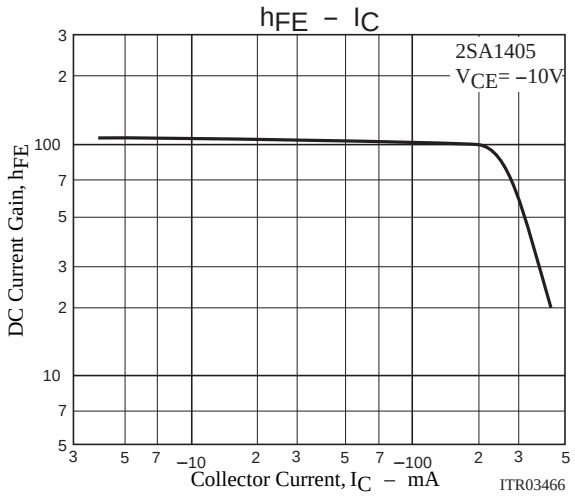
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)70mA, I_B=(–)7mA			0.6	V
					(–)0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)70mA, I_B=(–)7mA			(–)1.0	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)120			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	IC=(–)1mA, R_{BE}=∞	(–)120			V
Emitter-to-Base Breakdown Votage	$V_{(BR)EBO}$	I_E=(–)100μA, I_C=0	(–)4			V
Output Capacitance	C_{ob}	V_{CB}=(–)30V, f=1MHz		2.9		pF
				(4.3)		pF
Reverse Transfer Capacitance	C_{re}	V_{CB}=(–)30V, f=1MHz		2.5		pF
				(3.8)		pF

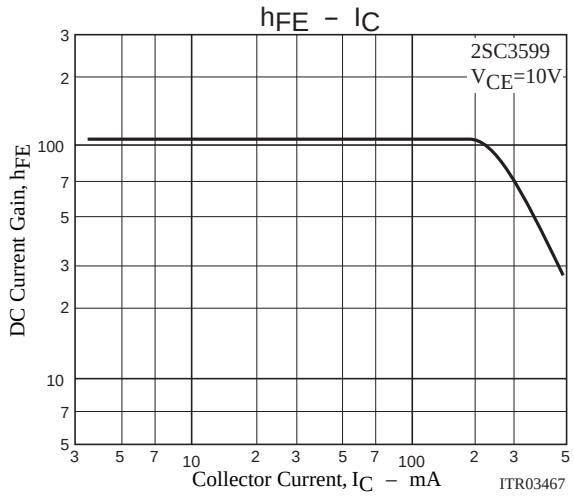


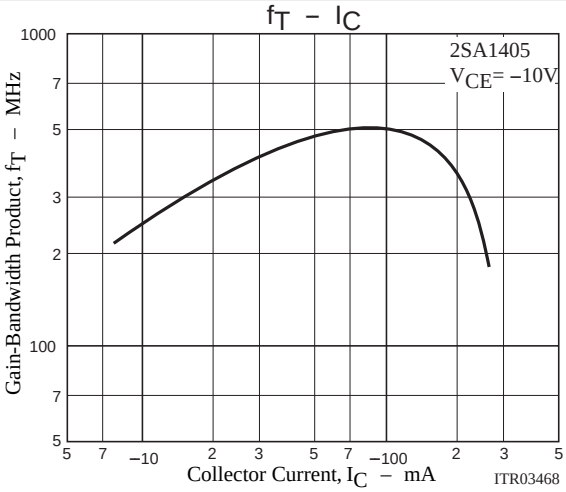


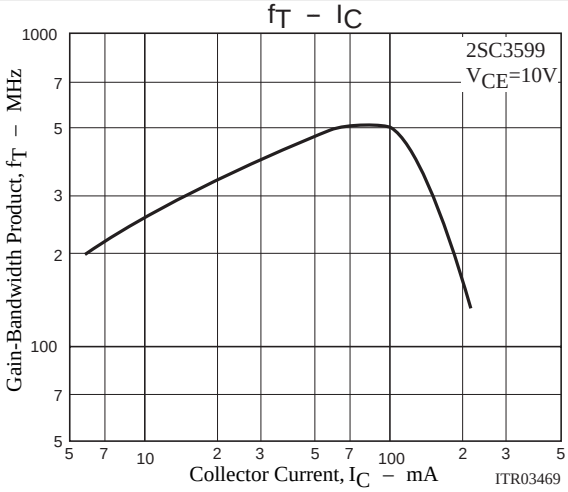


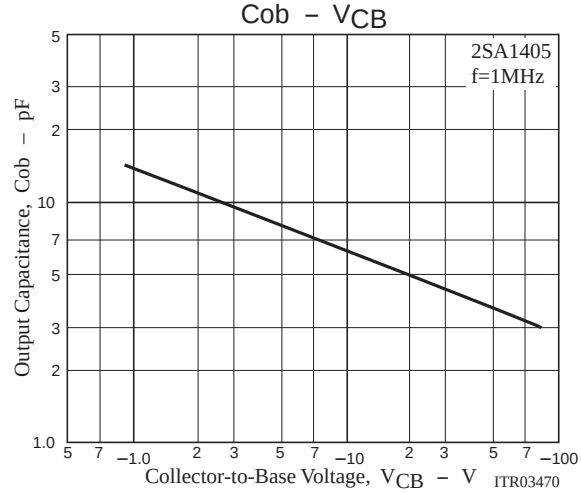


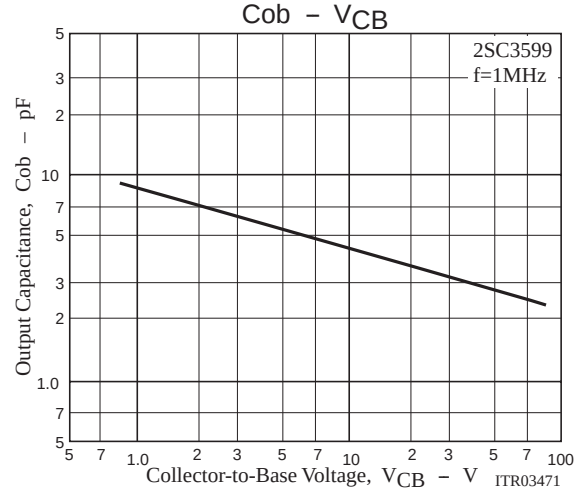


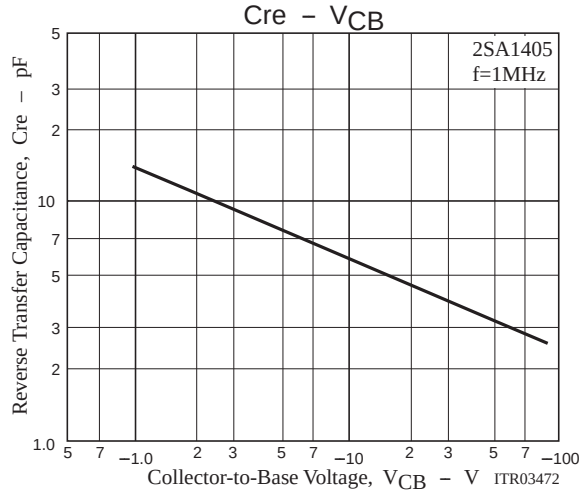


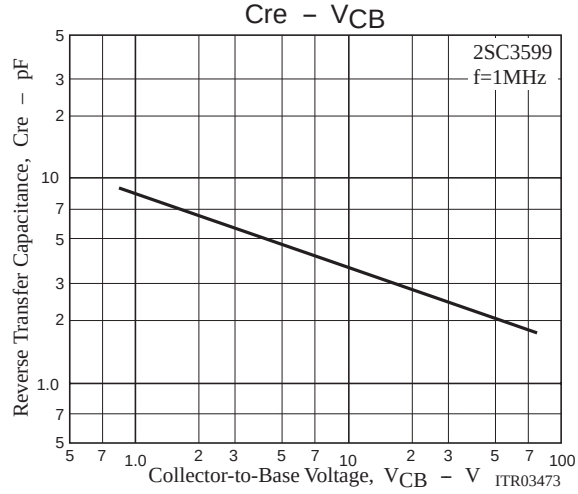

fT – IC
2SA1405
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR03468

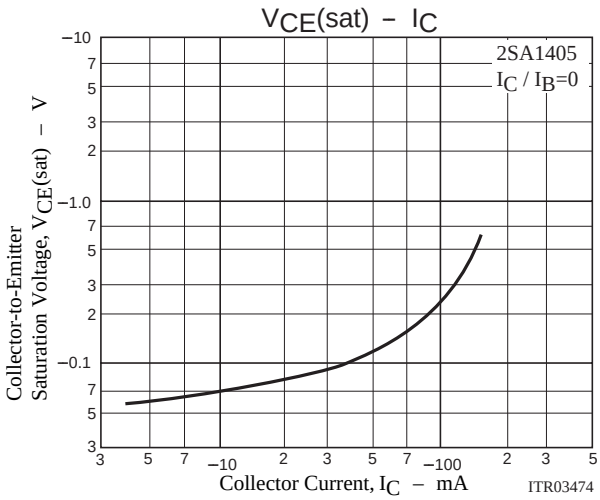

fT – IC
2SC3599
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR03469

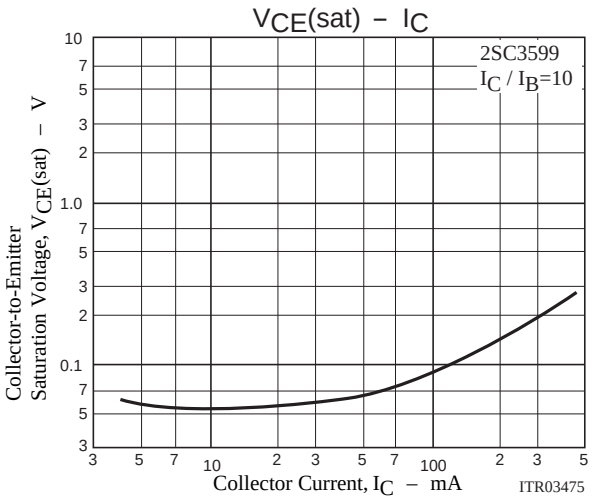

Cob – VCB
2SA1405
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03470


Cob – VCB
2SC3599
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03471


Cre – VCB
2SA1405
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
ITR03472


Cre – VCB
2SC3599
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
ITR03473


VCE(sat) – IC
2SA1405
IC / IB=0
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR03474


VCE(sat) – IC
2SC3599
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR03475