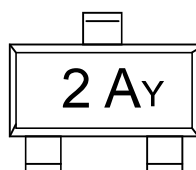


**Electrical Characteristics @ 25°C Unless Otherwise Specified**

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40			V	$I_C=-10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage <sup>(2)</sup>	$V_{(BR)CEO}$	-40			V	$I_C=-1mA, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E=-10\mu A, I_C=0$
Collector-Base Cutoff Current	$I_{CBO}$			-100	nA	$V_{CB}=-40V, I_E=0$
Collector Cutoff Current	$I_{CEX}$			-50	nA	$V_{CE}=-30V, V_{BE}=-3V$
Emitter-Base Cutoff Current	$I_{EBO}$			-100	nA	$V_{EB}=-5V, I_C=0$
DC Current Gain <sup>(2)</sup>	$h_{FE(1)}$	100		300		$V_{CE}=-1V, I_C=-10mA$
	$h_{FE(2)}$	60				$V_{CE}=-1V, I_C=-50mA$
	$h_{FE(3)}$	30				$V_{CE}=-1V, I_C=-100mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.25	V	$I_C=-10mA, I_B=-1mA$
				-0.4	V	$I_C=-50mA, I_B=-5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-0.65		-0.85	V	$I_C=-10mA, I_B=-1mA$
				-0.95	V	$I_C=-50mA, I_B=-5mA$
Transition Frequency	$f_T$	250			MHz	$V_{CE}=-20V, I_C=-10mA, f=100MHz$
Output Capacitance	$C_{cbo}$			4.5	pF	$V_{CB}=-5V, I_E=0, f=1MHz$
Input Capacitance	$C_{ibo}$			10	pF	$V_{BE}=-0.5V, I_C=0, f=1MHz$
Noise Figure	NF			4	dB	$V_{CE}=-5V, I_C=100\mu A, R_S=1K, f=1KHz$
Delay Time	$t_d$			35	ns	$V_{CC}=-3V, I_C=-10mA$
Rise Time	$t_r$			35	ns	$V_{BE}=-0.5V, I_{B1}=I_{B2}=-1mA$
Storage Time	$t_s$			225	ns	$V_{CC}=-3V, I_C=-10mA$
Fall Time	$t_f$			75	ns	$I_{B1}=I_{B2}=-1mA$

 Note: 2. Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$ 
**Marking Information**

 2A = Product Type Marking Code  
 Y = Date Code Marking

Date code Key (2 years a cycle)

Year	2011											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	J	O	L	C	K	B	P	D	M	E	G	F

Year	2012											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	W	N	Y	T	R	H	A	I	U	X	Z	S

## Curve Characteristics

Fig. 1 - Static Characteristics

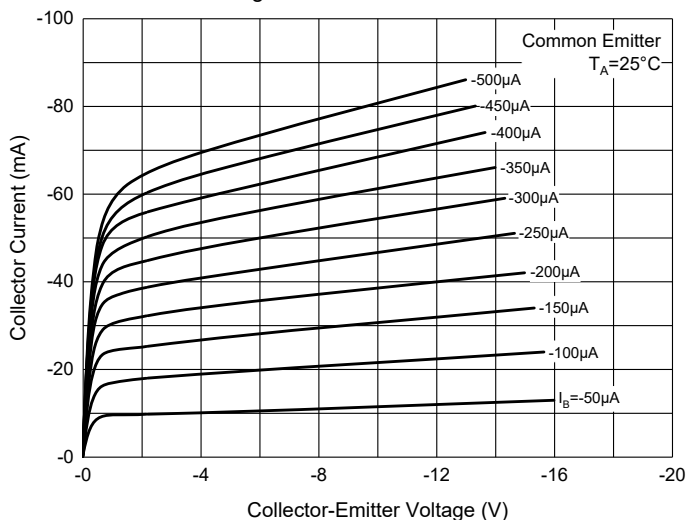


Fig. 2 - DC Current Gain Characteristics

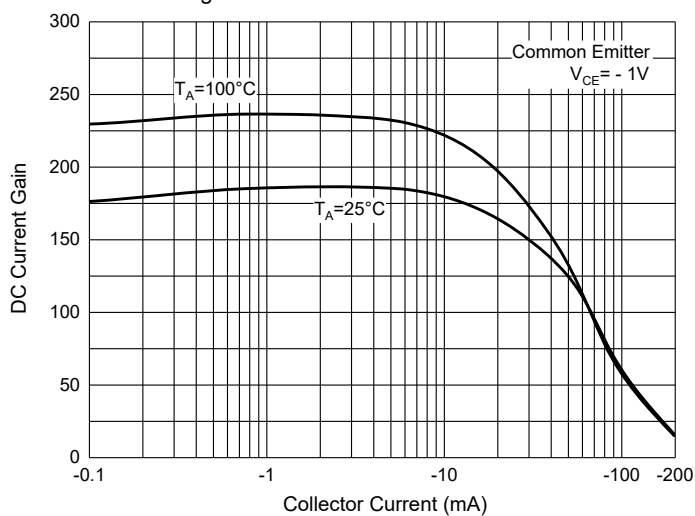


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

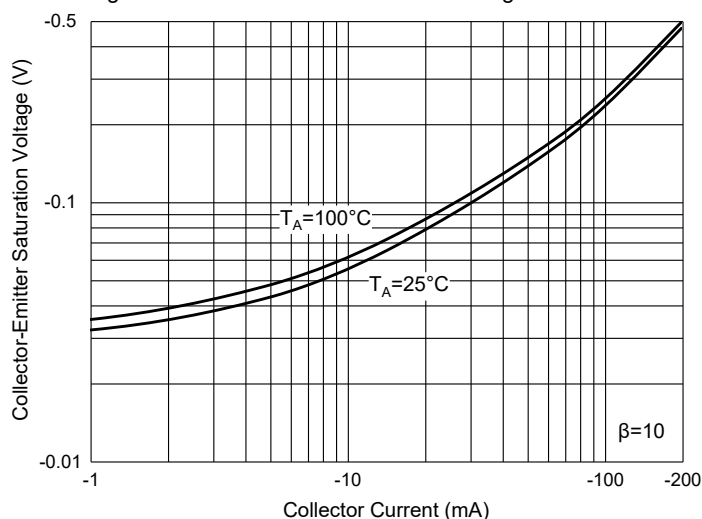


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

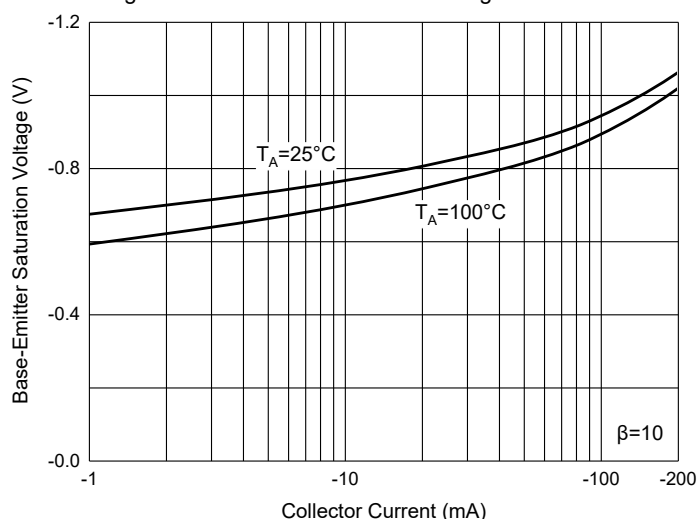


Fig. 5 - Base-Emitter Voltage Characteristics

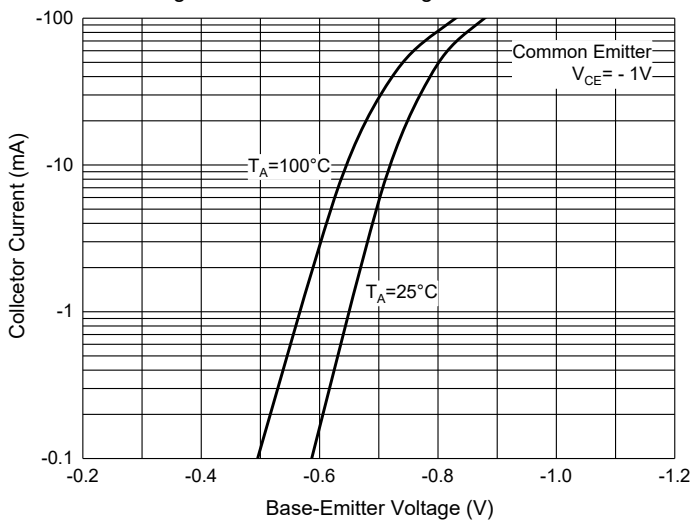
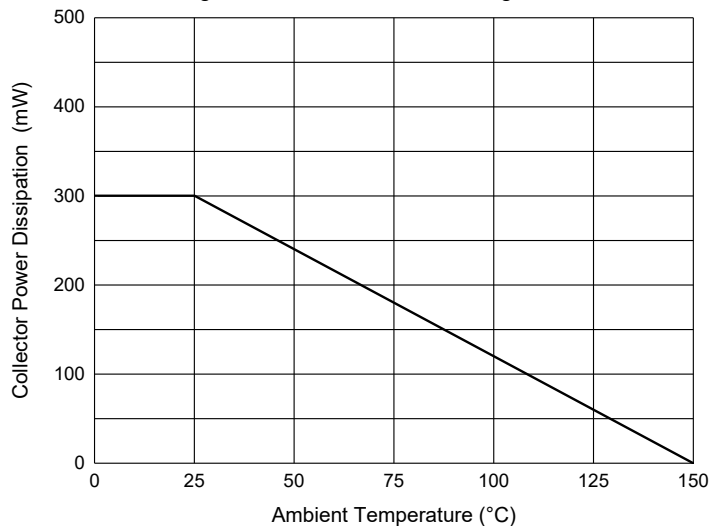


Fig. 6 - Collector Power Derating Curve



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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