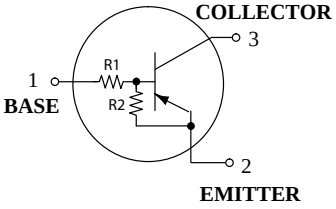
WEITRON

DTA114EM Series

Bias Resistor Transistor PNP Silicon

Lead(Pb)-Free



SOT-723

Maximum Ratings (TA=25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Collector Current-Continuous	I_C	100	mA

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board FR-4 Board(1) T_A=25˚C Derate above 25˚C	P_D	260 2.0	mW mW/°C
Thermal Resistance, Junction to Ambient(1)	$R_{\theta JA}$	480	˚C/W
Total Device Dissipation FR-5 Board FR-4 Board(2) T_A=25˚C Derate above 25˚C	P_D	600 4.8	mW mW/°C
Thermal Resistance, Junction to Ambient(2)	$R_{\theta JA}$	205	°C/W
Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

1. FR-4 @ Minimum pad
2. FR-4 @1.0 x 1.0 Inch pad

Device Marking and Resistor Values

Device	Marking	R1(K)	R2(K)
DTA114EM	6A	10	10
DTA124EM	6B	22	22
DTA144EM	6C	47	47
DTA114YM	6D	10	47
DTA114TM	6E	10	∞
DTA143TM	6F	4.7	∞
DTA123EM	6H	2.2	2.2

Device	Marking	R1(K)	R2(K)
DTA143EM	6J	4.7	4.7
DTA143ZM	6K	4.7	47
DTA124XM	6L	22	47
DTA123JM	6M	2.2	47
DTA115EM	6N	100	100
DTA144WM	6P	47	22

Electrical Characteristics (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Off Characteristics						
Collector−Base Cutoff Current (V_{CB} = 50 V, I_E = 0)		I_{CBO}	−	−	100	nAdc
Collector−Emitter Cutoff Current (V_{CE} = 50 V, I_B = 0)		I_{CEO}	−	−	500	nAdc
Emitter−Base Cutoff Current	DTA114EM	I_{EBO}	−	−	0.5	mAdc
(V_{EB} = 6.0 V, I_C = 0)	DTA124EM		−	−	0.2	
	DTA144EM		−	−	0.1	
	DTA114YM		−	−	0.2	
	DTA114TM		−	−	0.9	
	DTA143TM		−	−	1.9	
	DTA123EM		−	−	2.3	
	DTA143EM		−	−	1.5	
	DTA143ZM		−	−	0.18	
	DTA124XM		−	−	0.13	
	DTA123JM		−	−	0.2	
	DTA115EM		−	−	0.05	
	DTA144WM		−	−	0.13	
Collector−Base Breakdown Voltage (I_C = 10 μA, I_E = 0)		$V_{(BR)CBO}$	50	−	−	Vdc
Collector−Emitter Breakdown Voltage (Note 3.) (I_C = 2.0 mA, I_B = 0)		$V_{(BR)CEO}$	50	−	−	Vdc
ON Characteristics (Note 3.)						
DC Current Gain	DTA114EM	h_{FE}	35	60	−	
(V_{CE} = 10 V, I_C = 5.0 mA)	DTA124EM		60	100	−	
	DTA144EM		80	140	−	
	DTA114YM		80	140	−	
	DTA114TM		160	250	−	
	DTA143TM		160	250	−	
	DTA123EM		8.0	15	−	
	DTA143EM		15	27	−	
	DTA143ZM		80	140	−	
	DTA124XM		80	130	−	
	DTA123JM		80	140	−	
	DTA115EM		80	150	−	
	DTA144WM		80	140	−	
Collector−Emitter Saturation Voltage (I_C = 10 mA, I_E = 0.3 mA)		$V_{CE(sat)}$	−	−	0.25	Vdc
(I_C = 10 mA, I_B = 5 mA) DTA123EM						
(I_C = 10 mA, I_B = 1 mA) DTA114TM/DTA143TM/ DTA143ZM/DTA124XM/DTA143EM						
Output Voltage (on)		V_{OL}				Vdc
(V_{CC} = 5.0 V, V_B = 2.5 V, R_L = 1.0 kΩ)	DTA114EM		−	−	0.2	
	DTA124EM		−	−	0.2	
	DTA114YM		−	−	0.2	
	DTA114TM		−	−	0.2	
	DTA143TM		−	−	0.2	
	DTA123EM		−	−	0.2	
	DTA143EM		−	−	0.2	
	DTA143ZM		−	−	0.2	
	DTA124XM		−	−	0.2	
	DTA123JM		−	−	0.2	
(V_{CC} = 5.0 V, V_B = 3.5 V, R_L = 1.0 kΩ)	DTA144EM		−	−	0.2	
(V_{CC} = 5.0 V, V_B = 5.5 V, R_L = 1.0 kΩ)	DTA115EM		−	−	0.2	
(V_{CC} = 5.0 V, V_B = 4.0 V, R_L = 1.0 kΩ)	DTA144WM		−	−	0.2	
Output Voltage (off) (V_{CC} = 5.0 V, V_B = 0.5 V, R_L = 1.0 kΩ)		V_{OH}	4.9	−	−	Vdc
(V_{CC} = 5.0 V, V_B = 0.25 V, R_L = 1.0 kΩ)	DTA114TM					
	DTA143TM					
	DTA123EM					
	DTA143EM					

3. Pulse Test: Pulse Width < 300 μs, Duty Cycle < 2.0%

Electrical Characteristics (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
Input Resistor	DTA114EM	R1	7.0	10	13	kΩ
	DTA124EM		15.4	22	28.6	
	DTA144EM		32.9	47	61.1	
	DTA114YM		7.0	10	13	
	DTA114TM		7.0	10	13	
	DTA143TM		3.3	4.7	6.1	
	DTA123EM		1.5	2.2	2.9	
	DTA143EM		3.3	4.7	6.1	
	DTA143ZM		3.3	4.7	6.1	
	DTA124XM		15.4	22	28.6	
	DTA123JM		1.54	2.2	2.86	
	DTA115EM		70	100	130	
	DTA144WM		32.9	47	61.1	
Resistor Ratio		R_1/R_2				
	DTA114EM/DTA124EM/DTA144EM		0.8	1.0	1.2	
	DTA115EM		0.17	0.21	0.25	
	DTA114YM		–	–	–	
	DTA114TM/DTA143TM/DTA143EM		0.8	1.0	1.2	
	DTA123EM		0.055	0.1	0.185	
	DTA143ZM		0.38	0.47	0.56	
	DTA124XM		0.038	0.047	0.056	
	DTA123JM		1.7	2.1	2.6	
	DTA144WM					

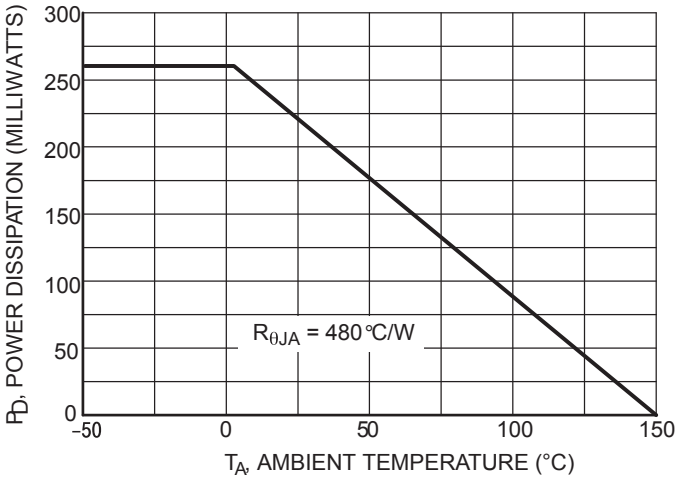


Figure 1. Derating Curve

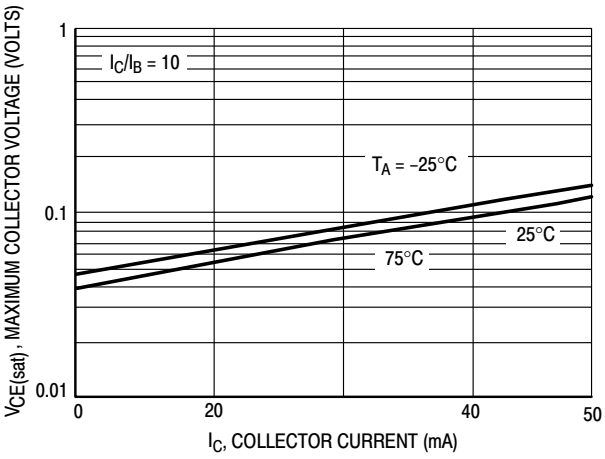


Figure 2. $V_{CE(sat)}$ versus I_C

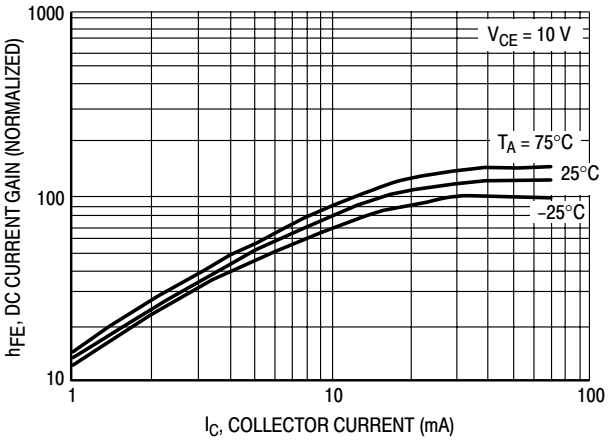


Figure 3. DC Current Gain

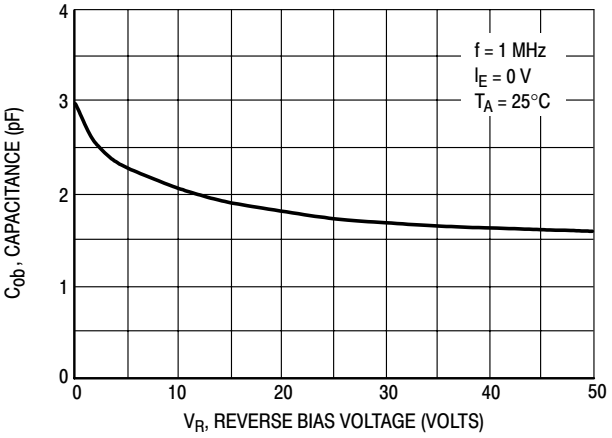


Figure 4. Output Capacitance

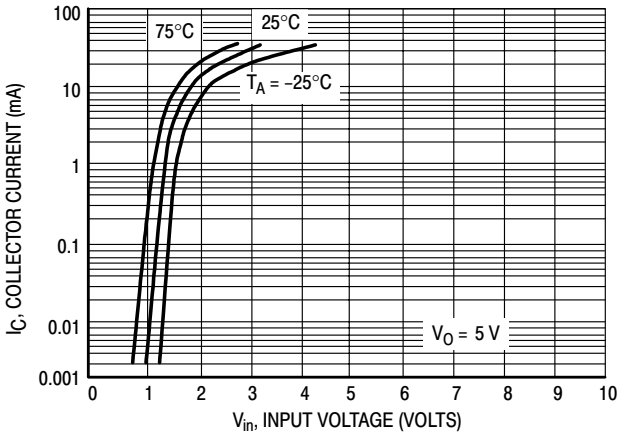


Figure 5. Output Current versus Input Voltage

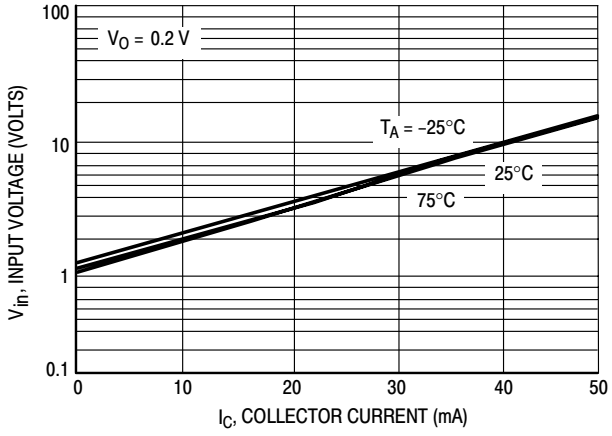


Figure 6. Input Voltage versus Output Current

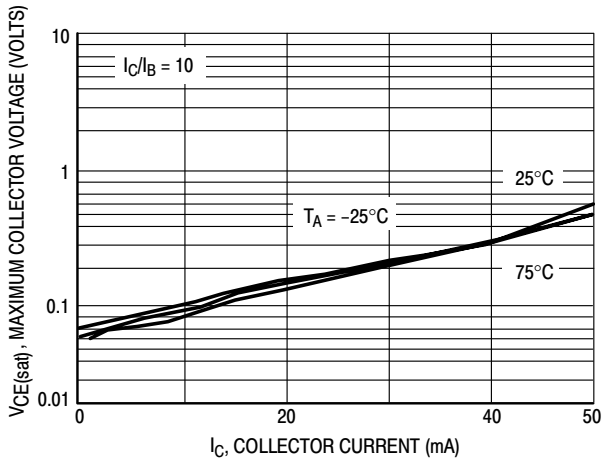


Figure 7. $V_{CE(sat)}$ versus I_C

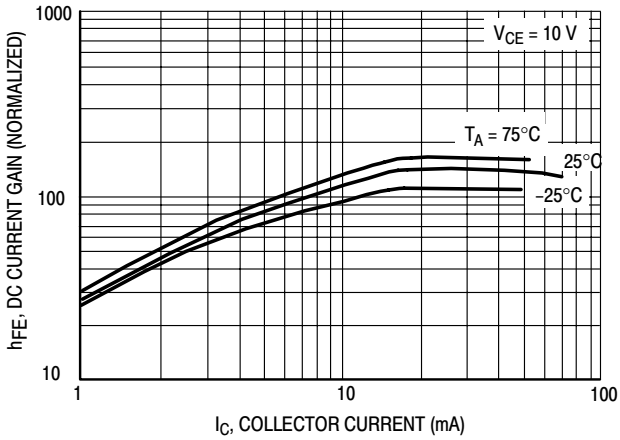


Figure 8. DC Current Gain

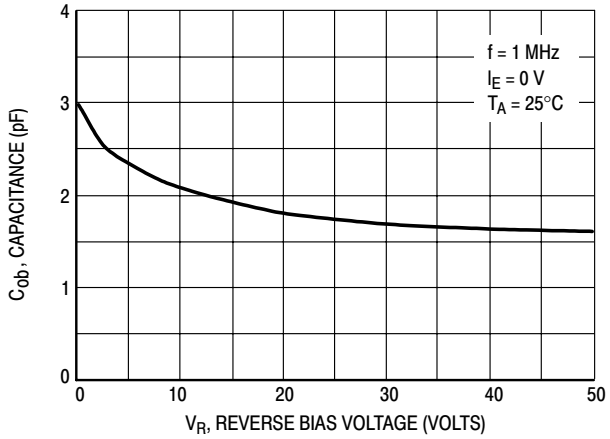


Figure 9. Output Capacitance

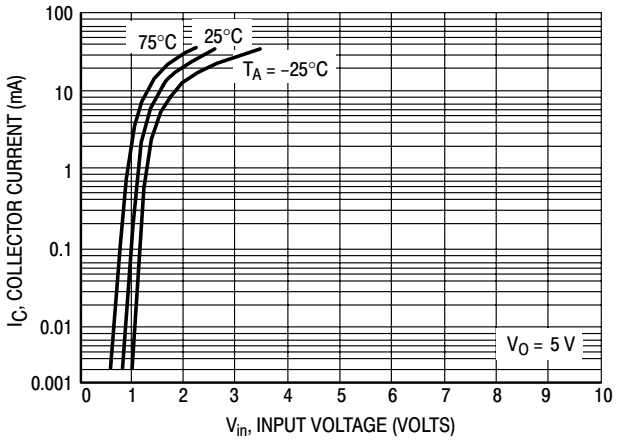


Figure 10. Output Current versus Input Voltage

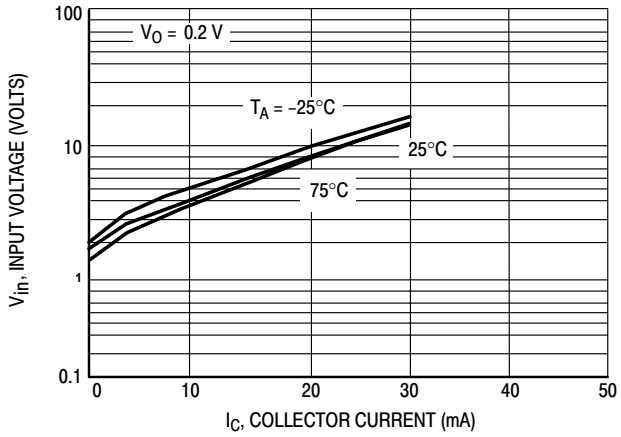


Figure 11. Input Voltage versus Output Current

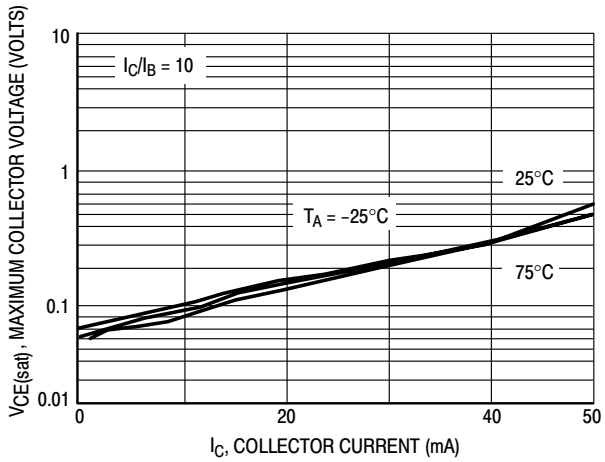


Figure 7. $V_{CE(sat)}$ versus I_C

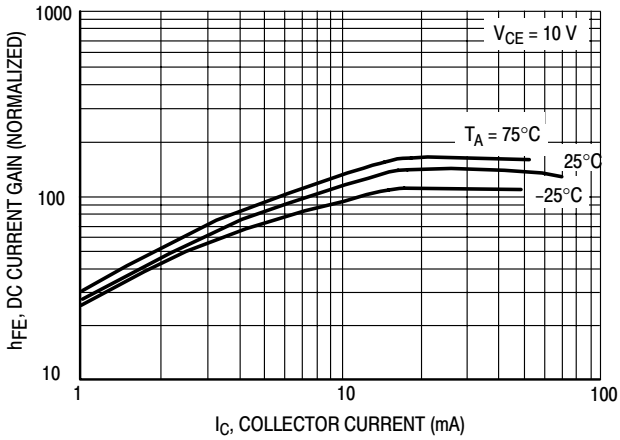


Figure 8. DC Current Gain

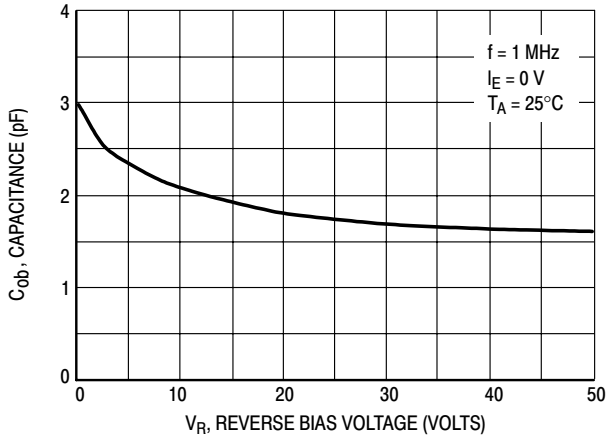
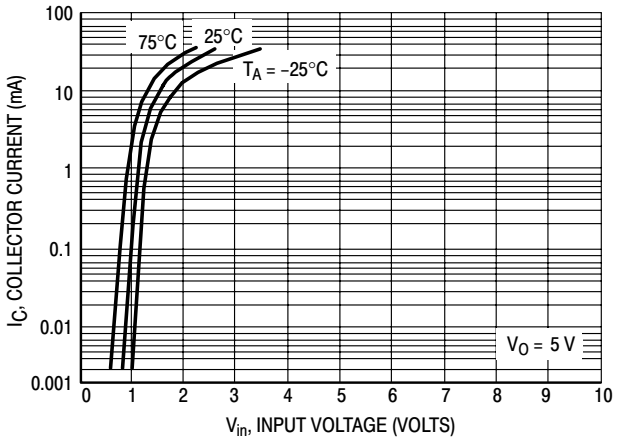


Figure 9. Output Capacitance



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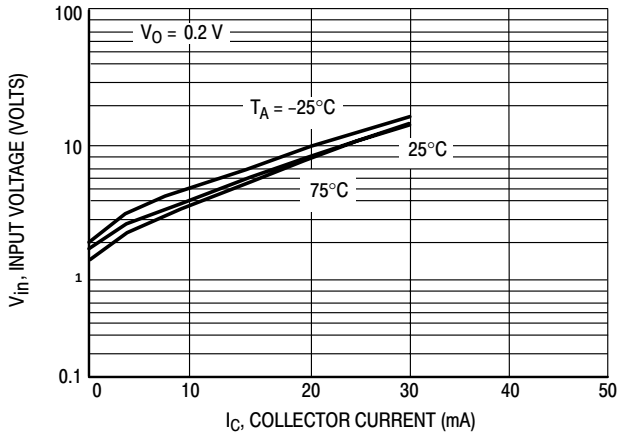


Figure 11. Input Voltage versus Output Current

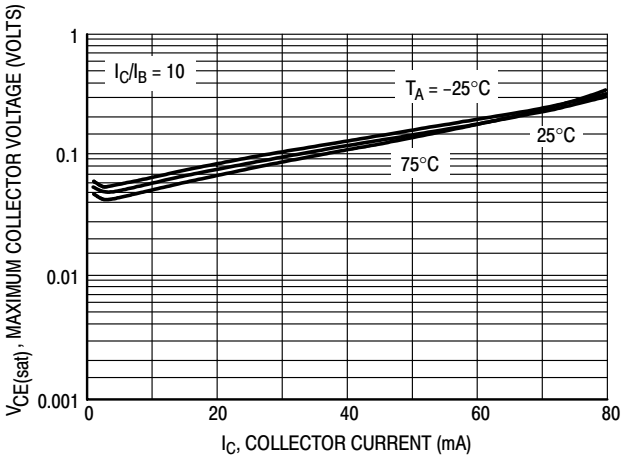


Figure 17. $V_{CE(sat)}$ versus I_C

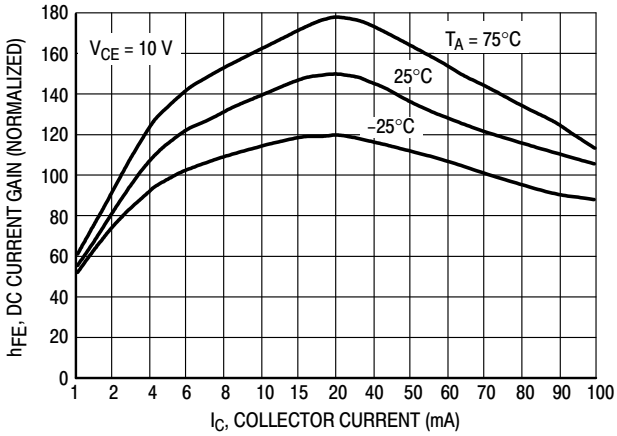


Figure 18. DC Current Gain

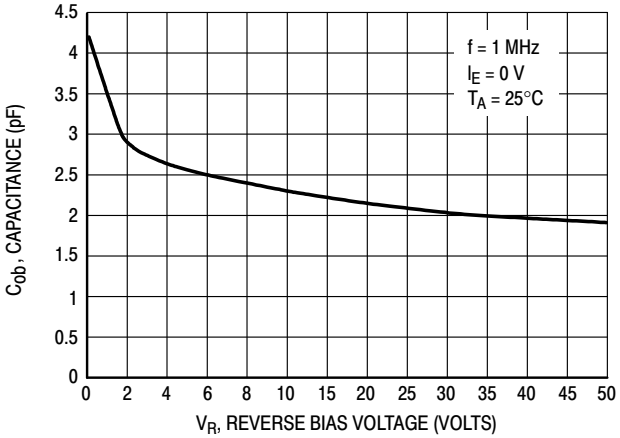


Figure 19. Output Capacitance

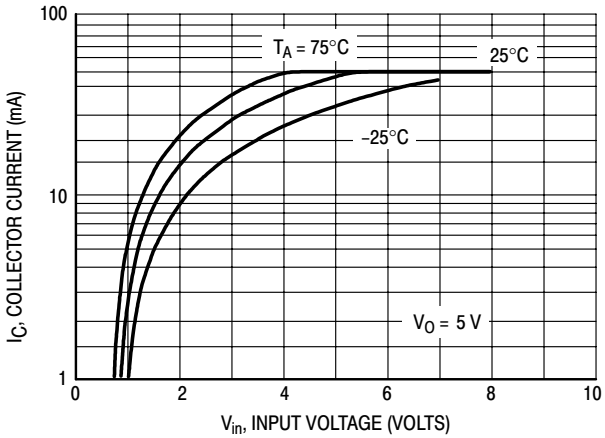


Figure 20. Output Current versus Input Voltage

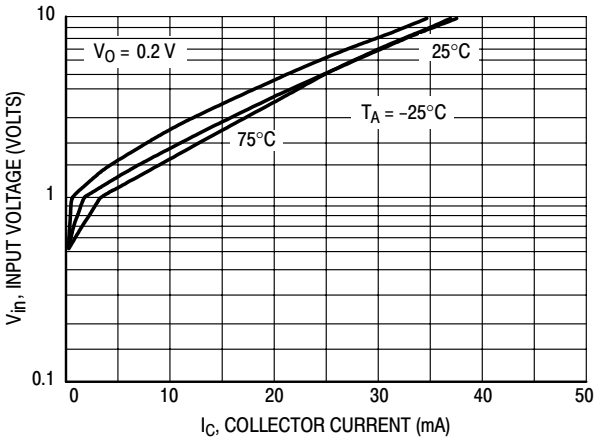


Figure 21. Input Voltage versus Output Current

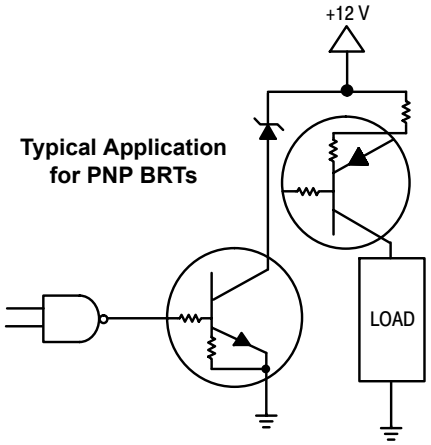


Figure 22. Inexpensive, Unregulated Current Source

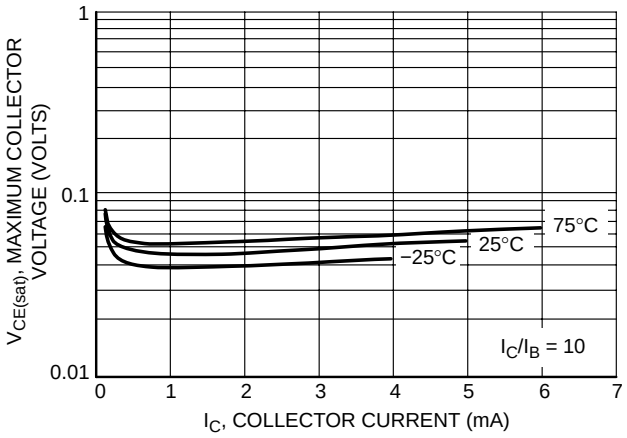


Figure 23. Maximum Collector Voltage versus Collector Current

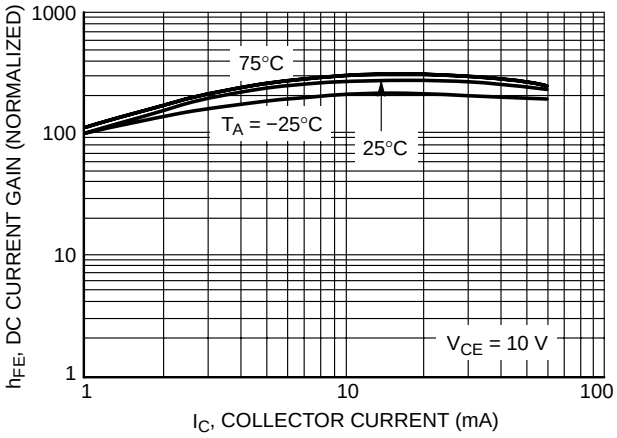


Figure 24. DC Current Gain

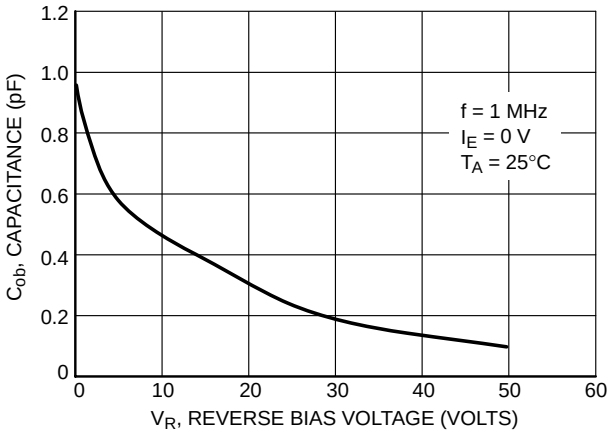


Figure 25. Output Capacitance

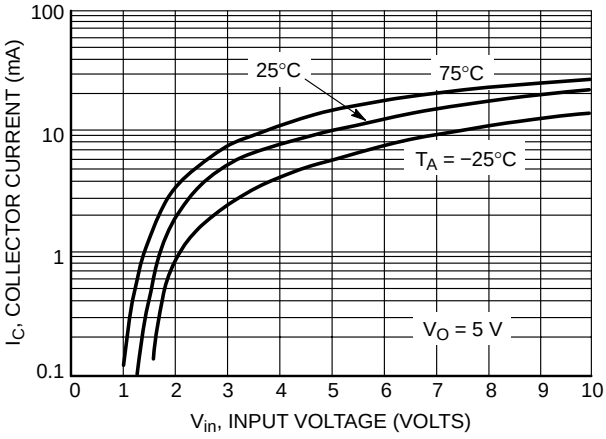


Figure 26. Output Current versus Input Voltage

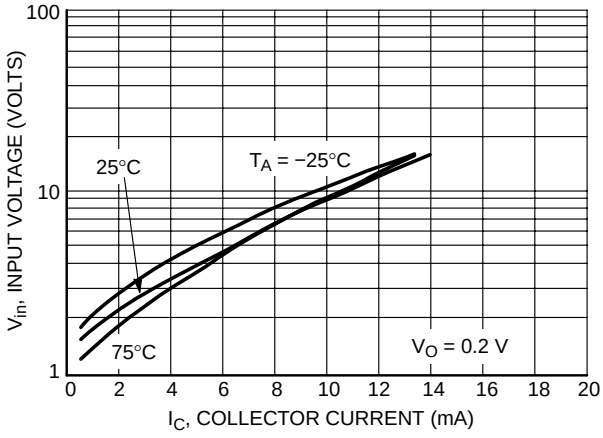


Figure 27. Input Voltage versus Output Current

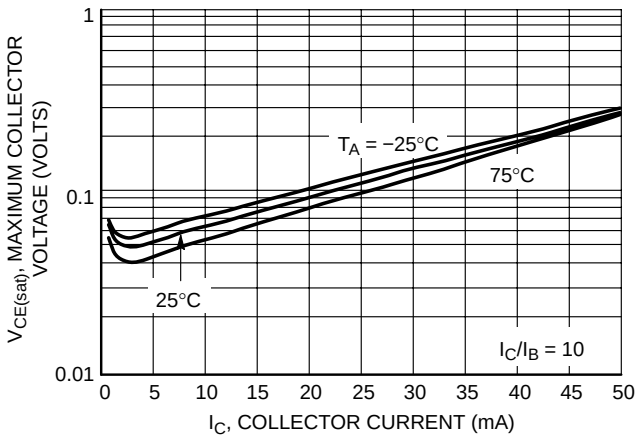


Figure 28. Maximum Collector Voltage versus Collector Current

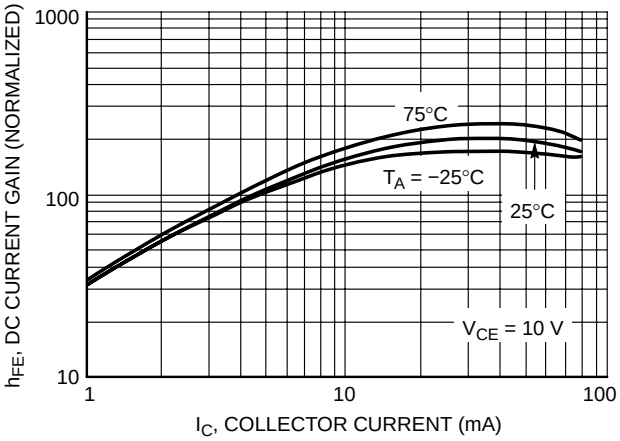


Figure 29. DC Current Gain

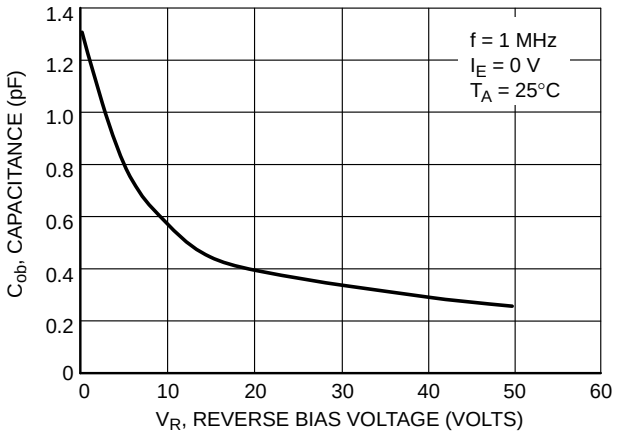


Figure 30. Output Capacitance

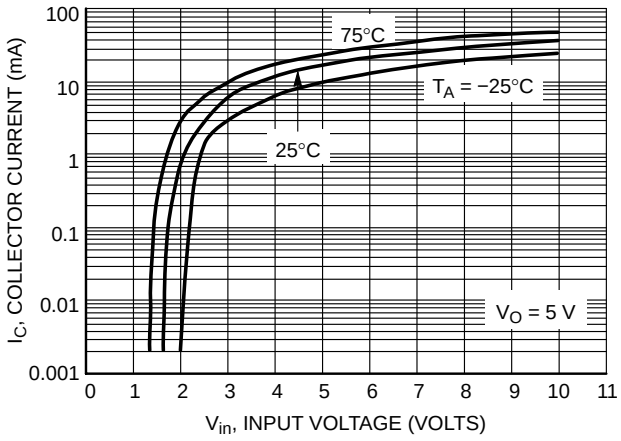


Figure 31. Output Current versus Input Voltage

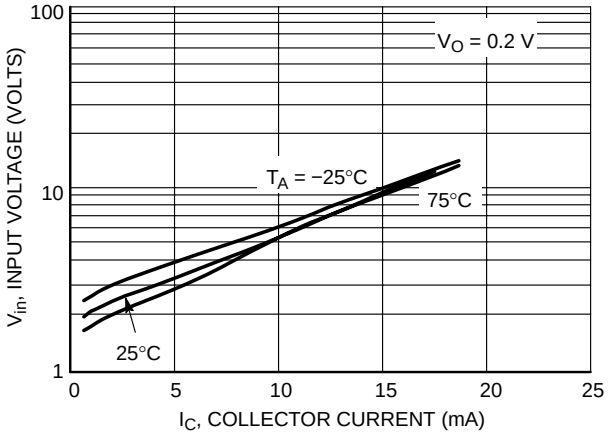
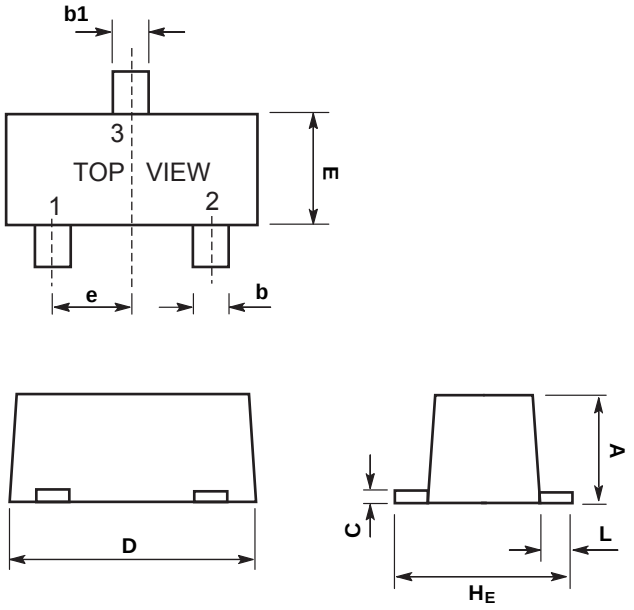


Figure 32. Input Voltage versus Output Current

SOT-723 Outline Demensions

Unit:mm



SOT-723			
Dim	**Min**	**Nom**	**Max**
A	0.45	0.50	0.55
b	0.15	0.20	0.27
b1	0.25	0.3	0.35
C	0.07	0.12	0.17
D	1.15	1.20	1.25
E	0.75	0.80	0.85
e	0.40 BSC		
H_E	1.15	1.20	1.25
L	0.15	0.20	0.25

SOLDERING FOOTPRINT

Unit:mm