

DTC114EET1 Series, SDTC114EET1 Series

ORDERING INFORMATION, DEVICE MARKING and RESISTOR VALUES

Device	Marking	R1 (K)	R2 (K)	Package	Shipping†
DTC114EET1	8A	10	10	SC-75/SOT-416	3000 Tape & Reel
DTC114EET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
SDTC114EET1G					
DTC124EET1	8B	22	22	SC-75/SOT-416	3000 Tape & Reel
DTC124EET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
SDTC124EET1G					
DTC144EET1	8C	47	47	SC-75/SOT-416	3000 Tape & Reel
DTC144EET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC114YET1	8D	10	47	SC-75/SOT-416	3000 Tape & Reel
DTC114YET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
SDTC114YET1G					
DTC114TET1	94	10	∞	SC-75/SOT-416	3000 Tape & Reel
DTC114TET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC143TET1	8F	4.7	∞	SC-75/SOT-416	3000 Tape & Reel
DTC143TET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC123EET1	8H	2.2	2.2	SC-75/SOT-416	3000 Tape & Reel
DTC123EET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC143EET1	8J	4.7	4.7	SC-75/SOT-416	3000 Tape & Reel
DTC143EET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC143ZET1	8K	4.7	47	SC-75/SOT-416	3000 Tape & Reel
DTC143ZET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC124XET1	8L	22	47	SC-75/SOT-416	3000 Tape & Reel
DTC124XET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC123JET1	8M	2.2	47	SC-75/SOT-416	3000 Tape & Reel
DTC123JET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC115EET1	8N	100	100	SC-75/SOT-416	3000 Tape & Reel
DTC115EET1G				SC-75/SOT-416 (Pb-Free)	3000 Tape & Reel
DTC144WET1	8P	47	22	SC-75/SOT-416	3000 Tape & Reel
DTC144WET1G				SC-75/SOT-416	3000 Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

DTC114EET1 Series, SDTC114EET1 Series

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Base Cutoff Current ($V_{CB} = 50\text{ V}$, $I_E = 0$)	I_{CBO}	–	–	100	nAdc
Collector–Emitter Cutoff Current ($V_{CE} = 50\text{ V}$, $I_B = 0$)	I_{CEO}	–	–	500	nAdc
Emitter–Base Cutoff Current ($V_{EB} = 6.0\text{ V}$, $I_C = 0$)	I_{EBO}	–	–	0.5	mAdc
DTC114EET1, SDTC114EET1		–	–	0.2	
DTC124EET1, SDTC124EET1		–	–	0.1	
DTC144EET1		–	–	0.2	
DTC114YET1, SDTC114YET1		–	–	0.9	
DTC114TET1		–	–	1.9	
DTC143TET1		–	–	2.3	
DTC123EET1		–	–	1.5	
DTC143EET1		–	–	0.18	
DTC143ZET1		–	–	0.13	
DTC124XET1		–	–	0.2	
DTC123JET1		–	–	0.05	
DTC115EET1		–	–	0.13	
DTC144WET1		–	–		
Collector–Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	50	–	–	Vdc
Collector–Emitter Breakdown Voltage (Note 3) ($I_C = 2.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	50	–	–	Vdc

ON CHARACTERISTICS (Note 3)

DC Current Gain ($V_{CE} = 10\text{ V}$, $I_C = 5.0\text{ mA}$)	DTC114EET1, SDTC114EET1 DTC124EET1, SDTC124EET1 DTC144EET1 DTC114YET1, SDTC114YET1 DTC114TET1 DTC143TET1 DTC123EET1 DTC143EET1 DTC143ZET1 DTC124XET1 DTC123JET1 DTC115EET1 DTC144WET1	h_{FE}	35 60 80 80 160 160 8.0 15 80 80 80 80 80	60 100 140 140 350 350 15 30 200 150 140 150 140	- - - - - - - - - - - - -	
Collector-Emitter Saturation Voltage ($I_C = 10\text{ mA}$, $I_B = 0.3\text{ mA}$) ($I_C = 10\text{ mA}$, $I_B = 5\text{ mA}$) DTC123EET1 ($I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$) DTC143TET1/DTC114TET1/ DTC143EET1/DTC143ZET1/DTC124XET1		$V_{CE(sat)}$	-	-	0.25	Vdc
Output Voltage (on) ($V_{CC} = 5.0\text{ V}$, $V_B = 2.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) DTC114EET1, SDTC114EET1 DTC124EET1, SDTC124EET1 DTC114YET1, SDTC114YET1 DTC114TET1 DTC143TET1 DTC123EET1 DTC143EET1 DTC143ZET1 DTC124XET1 DTC123JET1 ($V_{CC} = 5.0\text{ V}$, $V_B = 3.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) DTC144EET1 ($V_{CC} = 5.0\text{ V}$, $V_B = 5.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) DTC115EET1 ($V_{CC} = 5.0\text{ V}$, $V_B = 4.0\text{ V}$, $R_L = 1.0\text{ k}\Omega$) DTC144WET1		V_{OL}	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - -	0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	Vdc
Output Voltage (off) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.25\text{ V}$, $R_L = 1.0\text{ k}\Omega$) DTC143TET1 DTC143ZET1 DTC114TET1		V_{OH}	4.9	-	-	Vdc

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

DTC114EET1 Series, SDTC114EET1 Series

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
Input Resistor	SDTC114EET1, SDTC114ET1	R1	7.0	10	13	kΩ
	DTC124EET1, SDTC124EET1		15.4	22	28.6	
	DTC144EET1		32.9	47	61.1	
	DTC114YET1, SDTC114YET1		7.0	10	13	
	DTC114TET1		7.0	10	13	
	DTC143TET1		3.3	4.7	6.1	
	DTC123EET1		1.5	2.2	2.9	
	DTC143EET1		3.3	4.7	6.1	
	DTC143ZET1		3.3	4.7	6.1	
	DTC124XET1		15.4	22	28.6	
	DTC123JET1		1.54	2.2	2.86	
	DTC115EET1		70	100	130	
	DTC144WET1		32.9	47	61.1	
Resistor Ratio	DTC114EET1/SDTC114EET1/DTC115EET1	R1/R2	0.8	1.0	1.2	
	DTC124EET1/SDTC124EET1/DTC144EET1		0.17	0.21	0.25	
	DTC114YET1/SDTC114YET1		—	—	—	
	DTC143TET1/DTC114TET1		0.8	1.0	1.2	
	DTC123EET1/DTC143EET1		0.055	0.1	0.185	
	DTC143ZET1		0.38	0.47	0.56	
	DTC124XET1		0.038	0.047	0.056	
	DTC123JET1		1.7	2.1	2.6	
	DTC144WET1D					

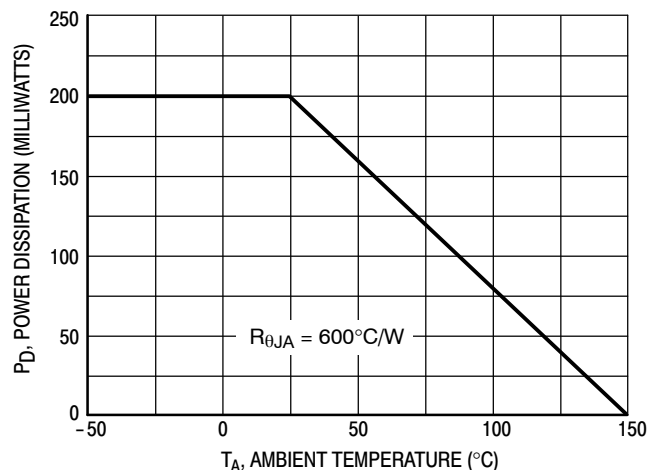


Figure 1. Derating Curve

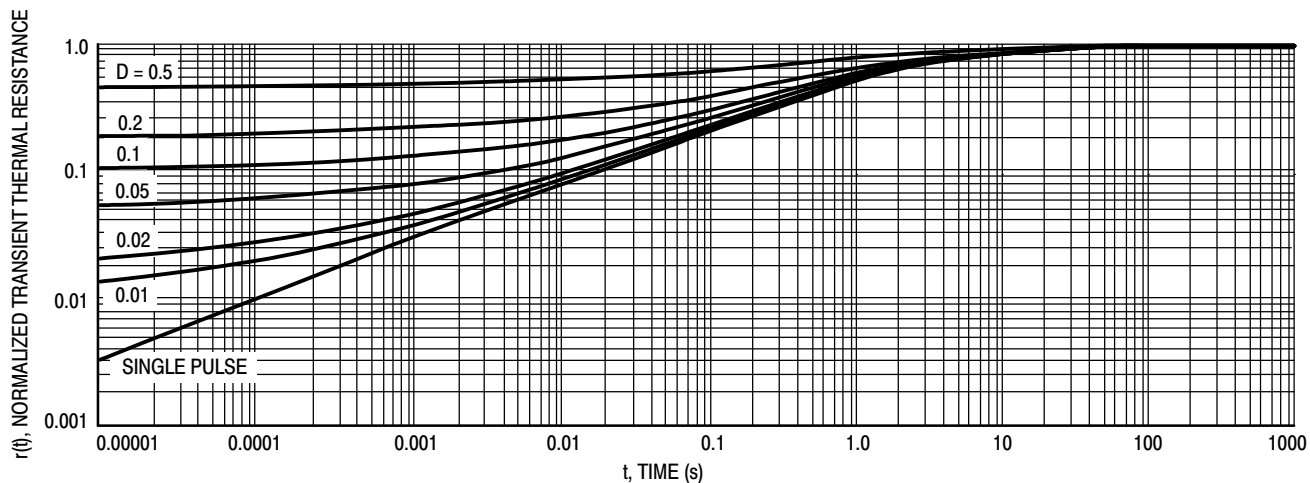


Figure 2. Normalized Thermal Response

DTC114EET1 Series, SDTC114EET1 Series

TYPICAL ELECTRICAL CHARACTERISTICS – DTC114EET1, SDTC114EET1

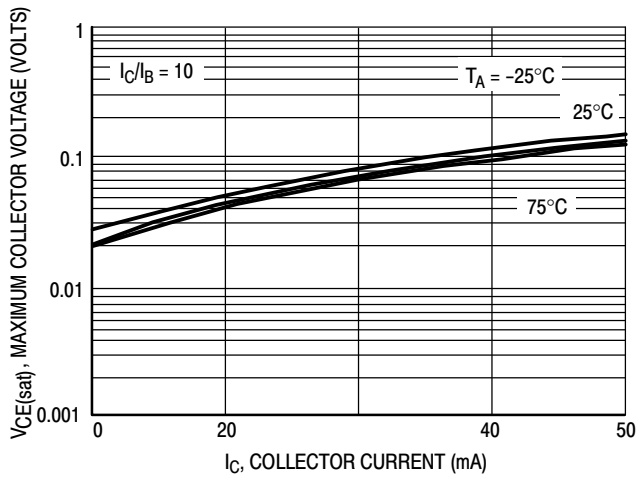


Figure 3. $V_{CE(sat)}$ versus I_C

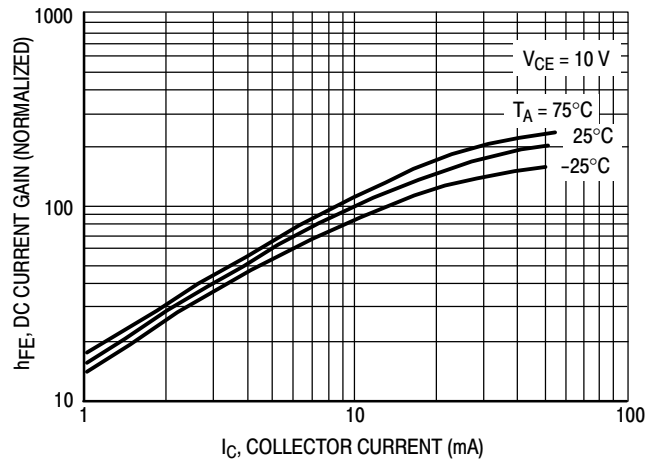


Figure 4. DC Current Gain

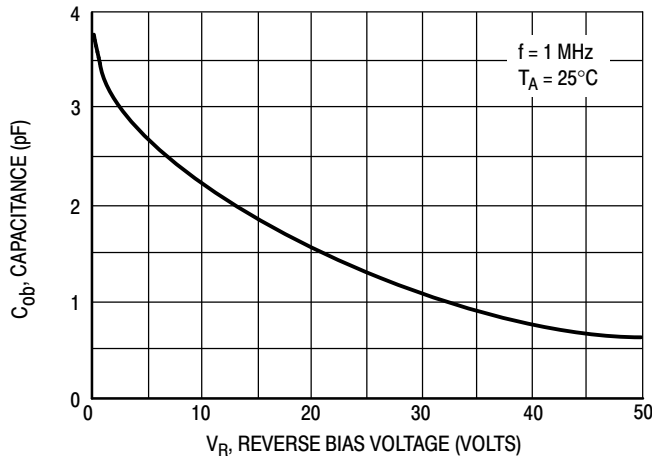


Figure 5. Output Capacitance

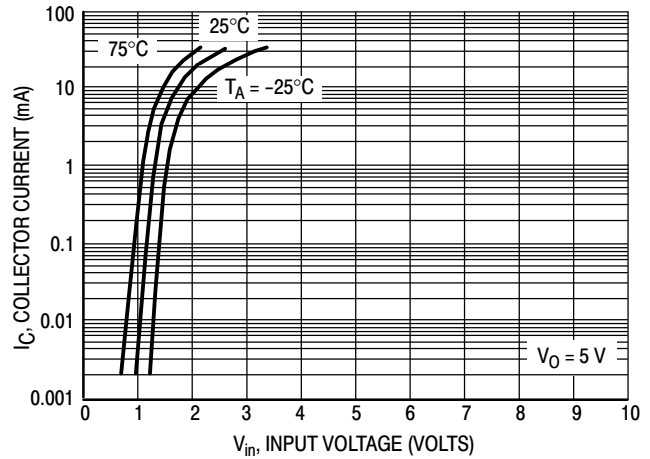


Figure 6. Output Current versus Input Voltage

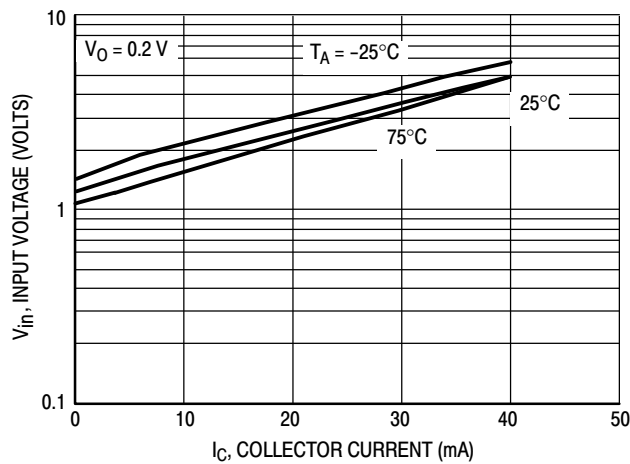


Figure 7. Input Voltage versus Output Current

TYPICAL ELECTRICAL CHARACTERISTICS - DTC123EET1

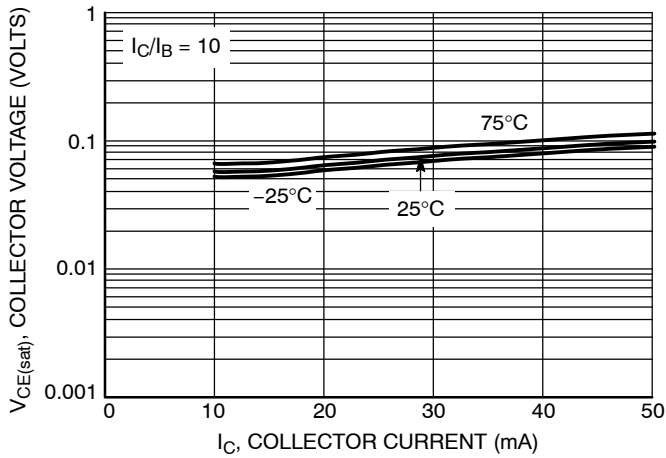


Figure 8. $V_{CE(sat)}$ versus I_C

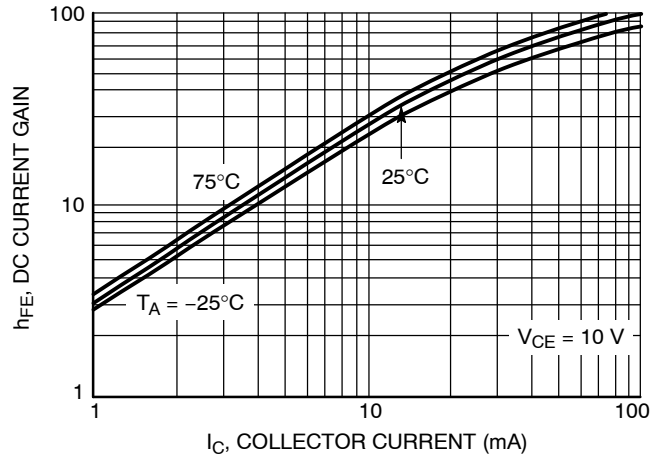


Figure 9. DC Current Gain

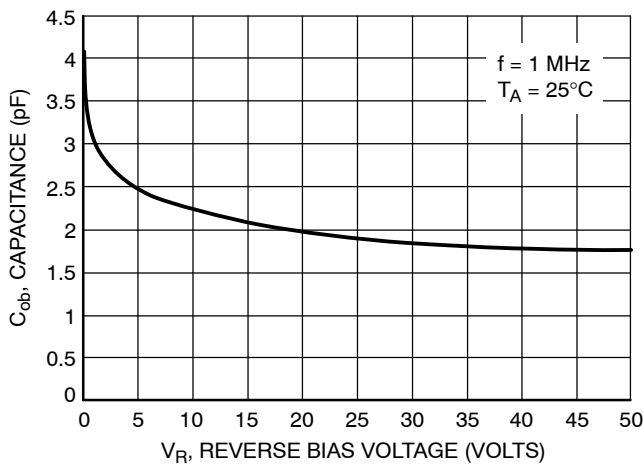


Figure 10. Output Capacitance

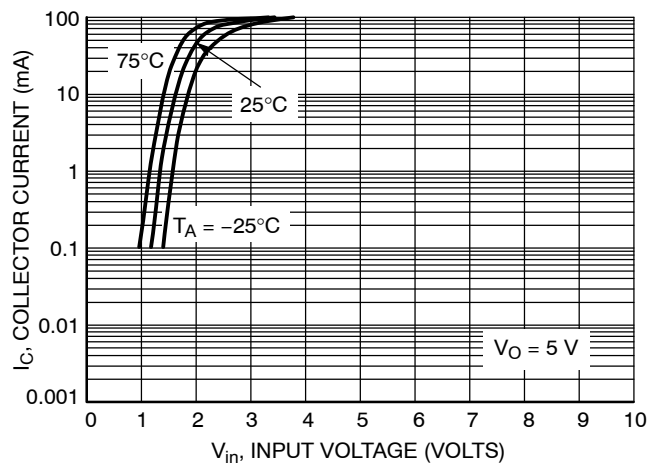


Figure 11. Output Current versus Input Voltage

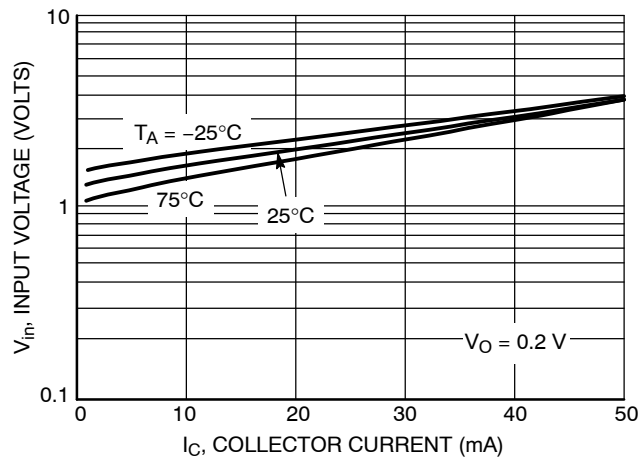


Figure 12. Input Voltage versus Output Current

DTC114EET1 Series, SDTC114EET1 Series

TYPICAL ELECTRICAL CHARACTERISTICS – DTC124EET1, SDTC124EET1

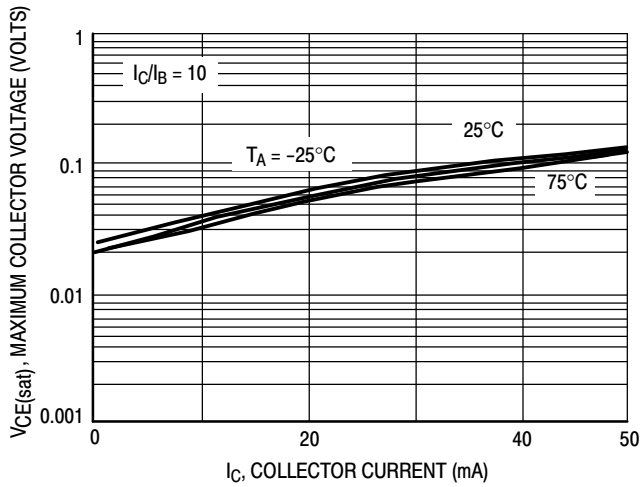


Figure 13. $V_{CE(sat)}$ versus I_C

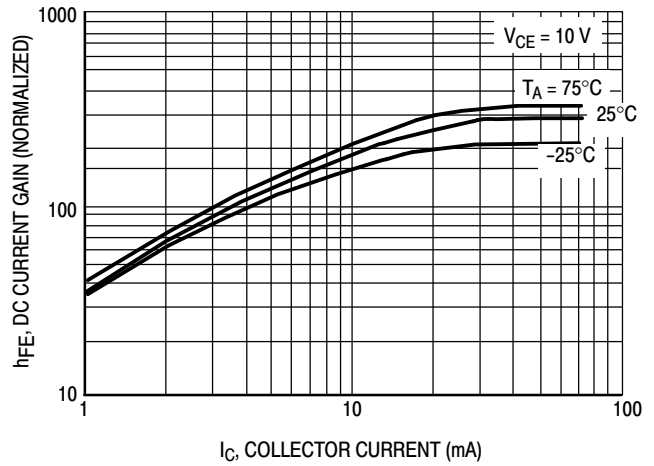


Figure 14. DC Current Gain

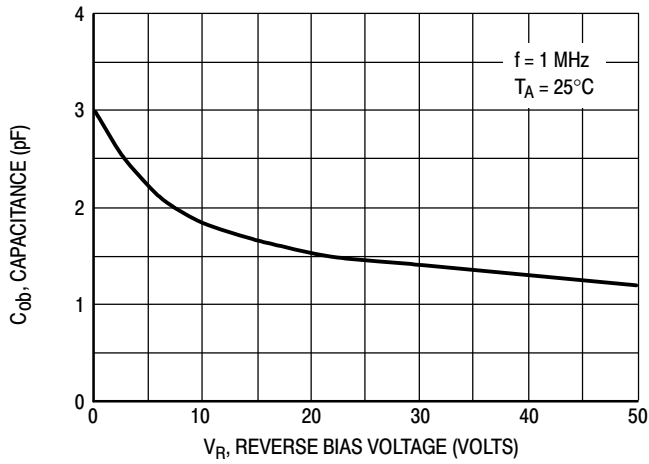


Figure 15. Output Capacitance

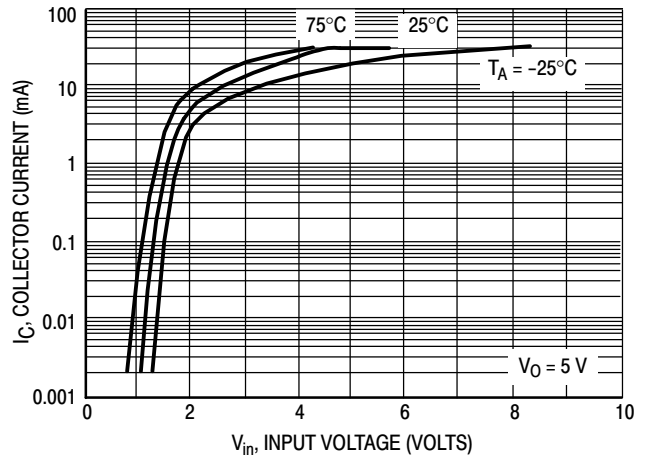


Figure 16. Output Current versus Input Voltage

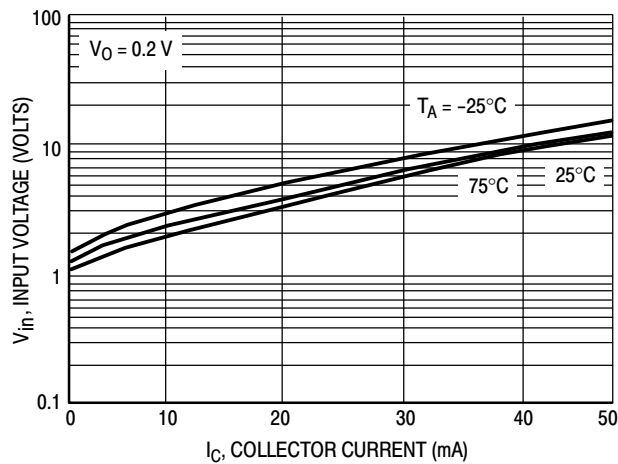


Figure 17. Input Voltage versus Output Current

DTC114EET1 Series, SDTC114EET1 Series

TYPICAL ELECTRICAL CHARACTERISTICS - DTC144EET1

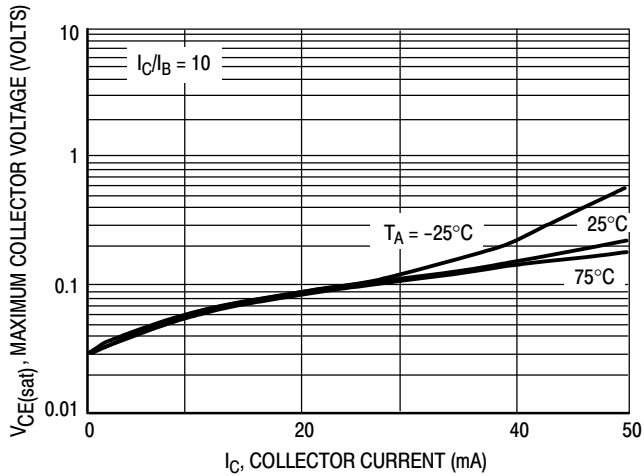


Figure 18. $V_{CE(sat)}$ versus I_C

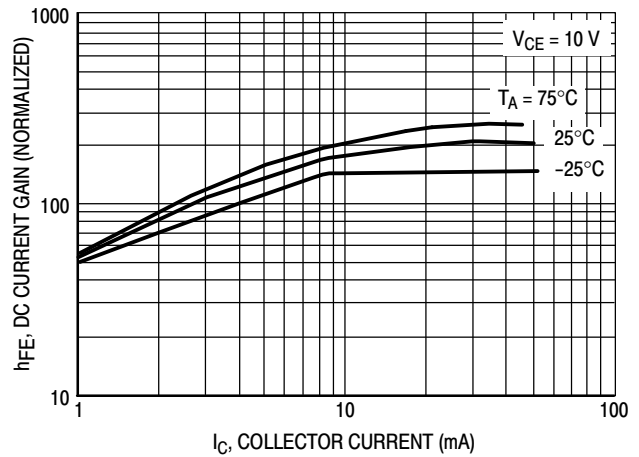


Figure 19. DC Current Gain

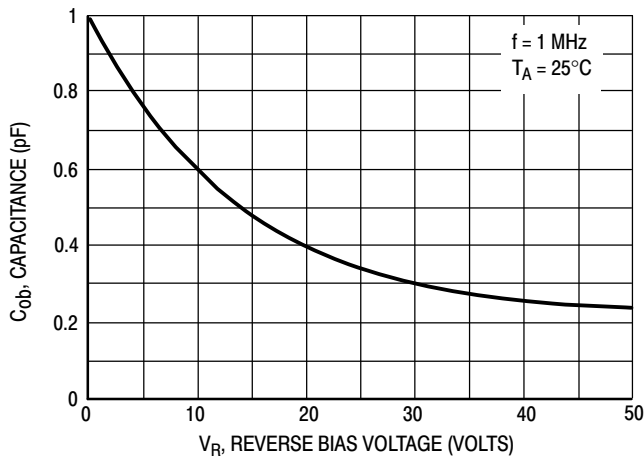


Figure 20. Output Capacitance

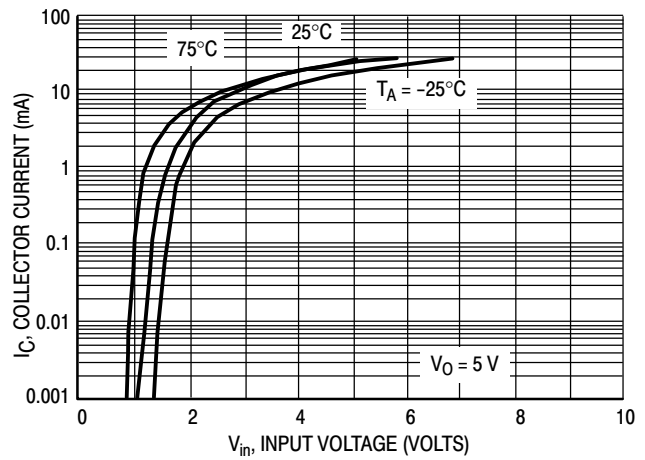


Figure 21. Output Current versus Input Voltage

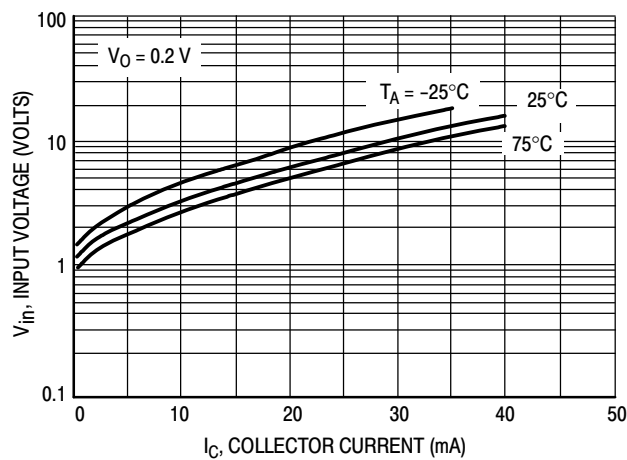


Figure 22. Input Voltage versus Output Current

DTC114EET1 Series, SDTC114EET1 Series

TYPICAL ELECTRICAL CHARACTERISTICS – DTC114YET1, SDTC114YET1

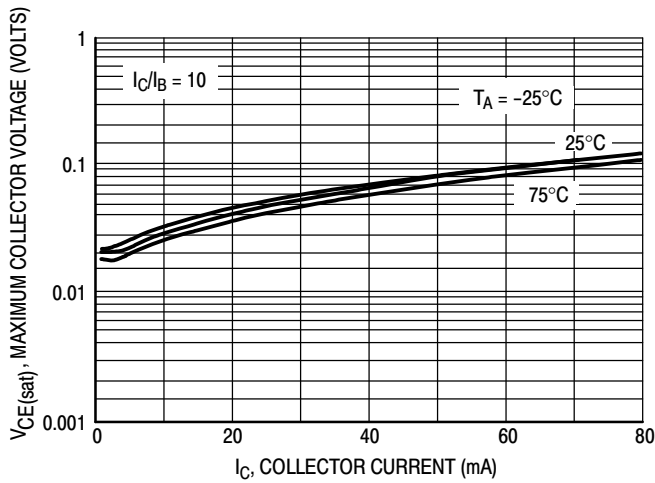


Figure 23. $V_{CE(sat)}$ versus I_C

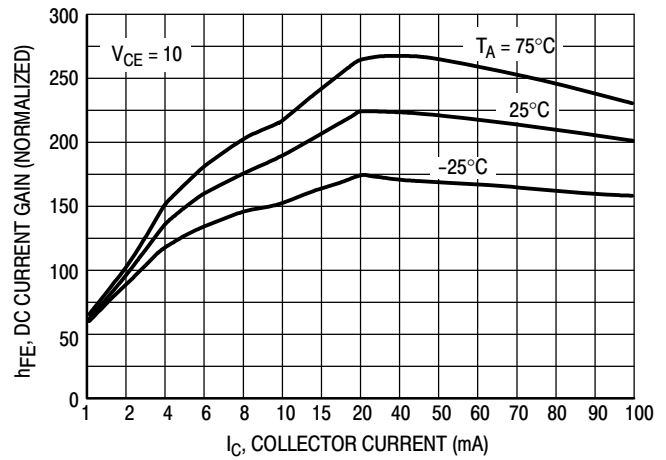


Figure 24. DC Current Gain

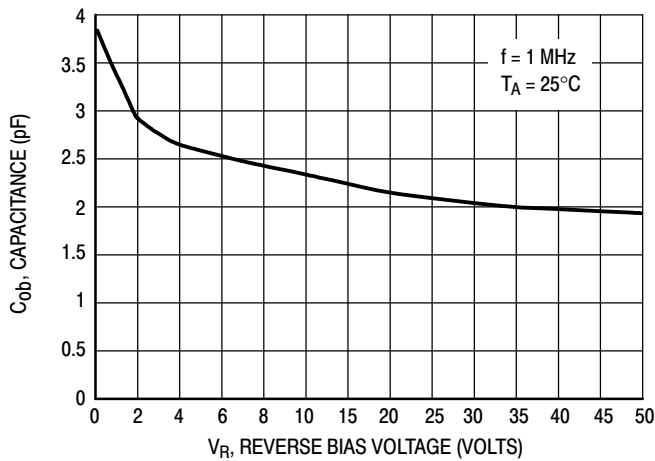


Figure 25. Output Capacitance

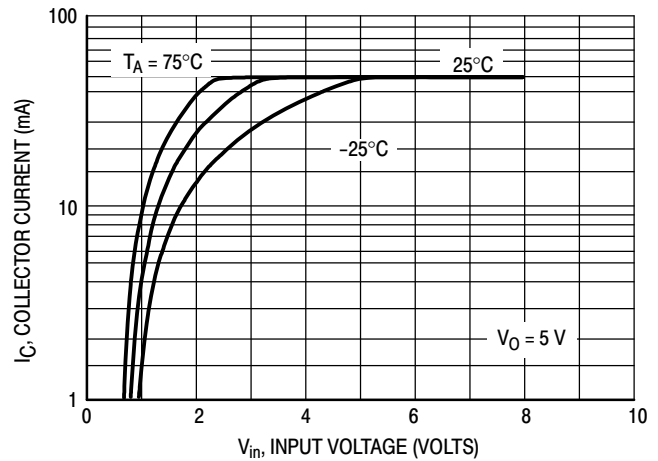


Figure 26. Output Current versus Input Voltage

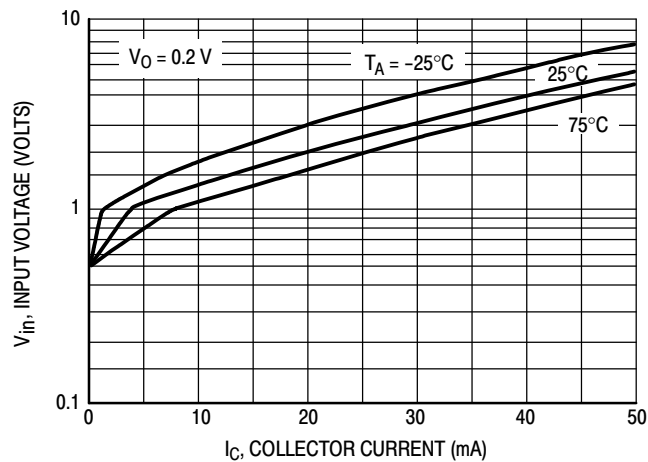


Figure 27. Input Voltage versus Output Current

TYPICAL ELECTRICAL CHARACTERISTICS – DTC123JET1G

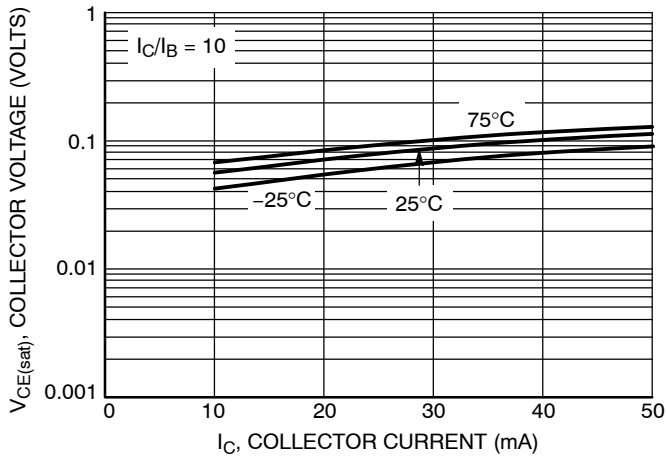


Figure 28. $V_{CE(sat)}$ versus I_C

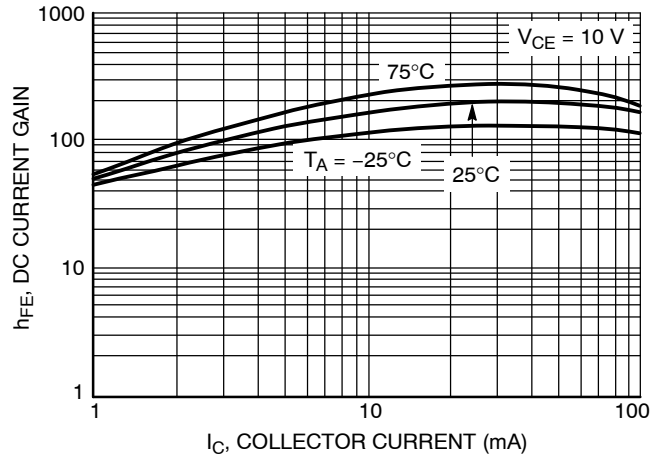


Figure 29. DC Current Gain

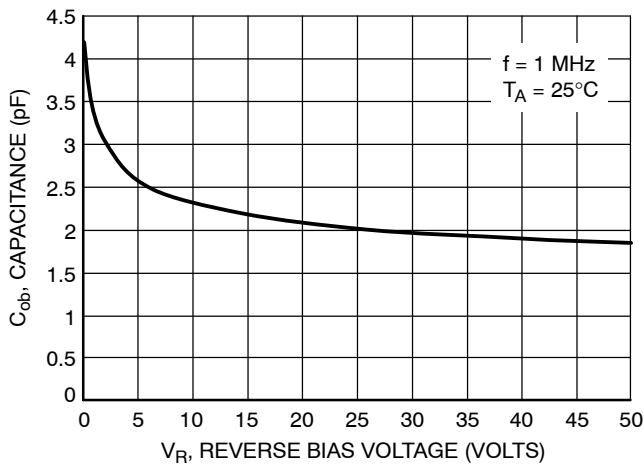


Figure 30. Output Capacitance

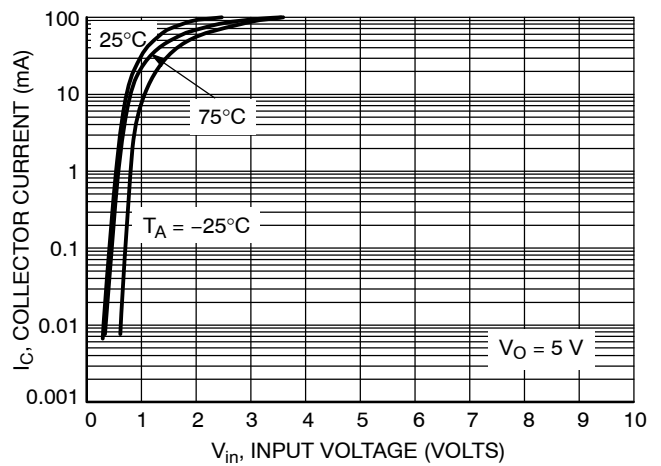


Figure 31. Output Current versus Input Voltage

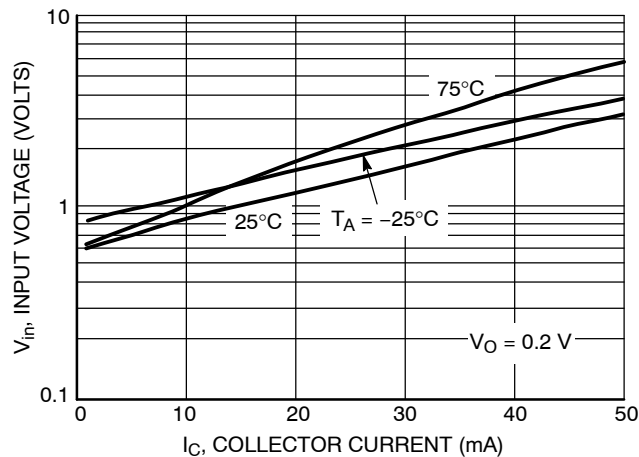


Figure 32. Input Voltage versus Output Current

TYPICAL ELECTRICAL CHARACTERISTICS - DTC143ZET1

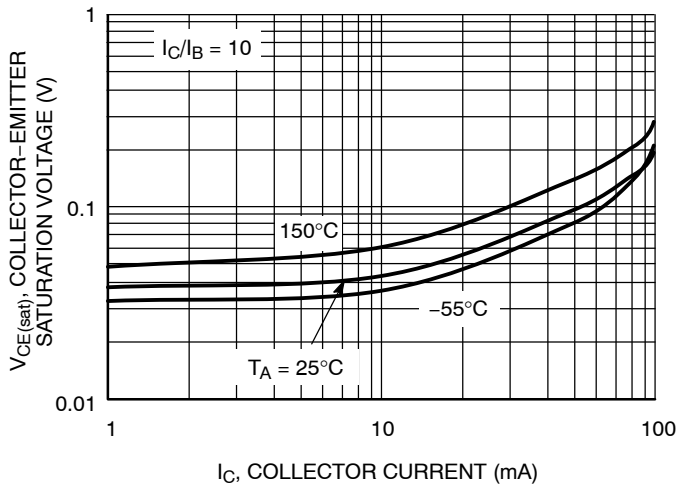


Figure 33. $V_{CE(sat)}$ versus I_C

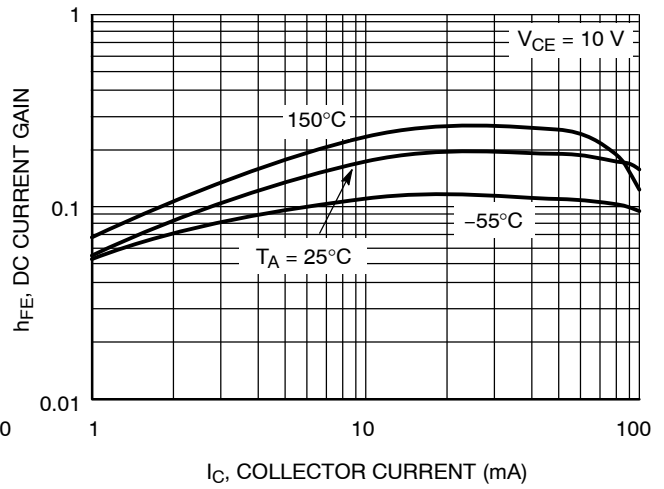


Figure 34. DC Current Gain

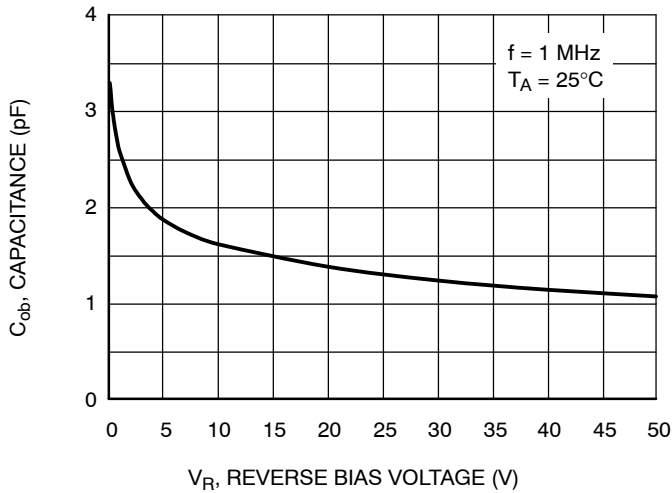


Figure 35. Output Capacitance

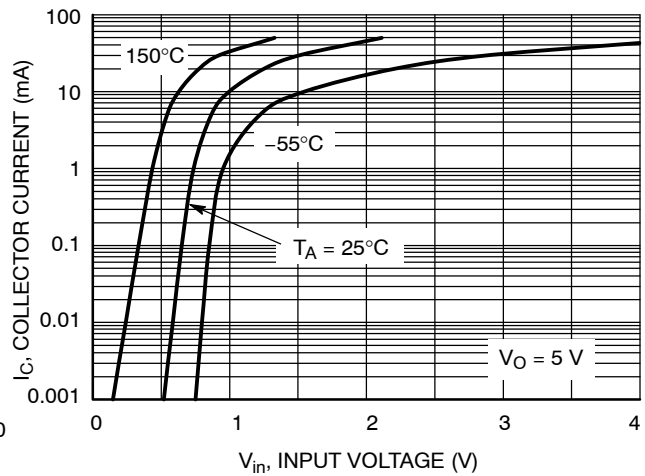


Figure 36. Output Current versus Input Voltage

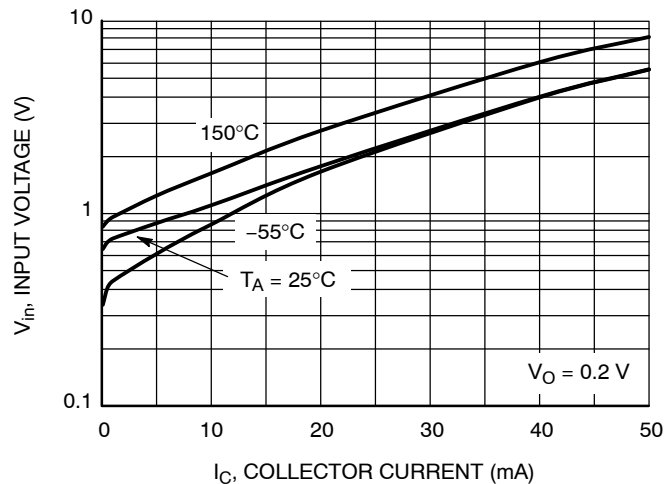


Figure 37. Input Voltage versus Output Current

DTC114EET1 Series, SDTC114EET1 Series

TYPICAL APPLICATIONS FOR NPN BRTs

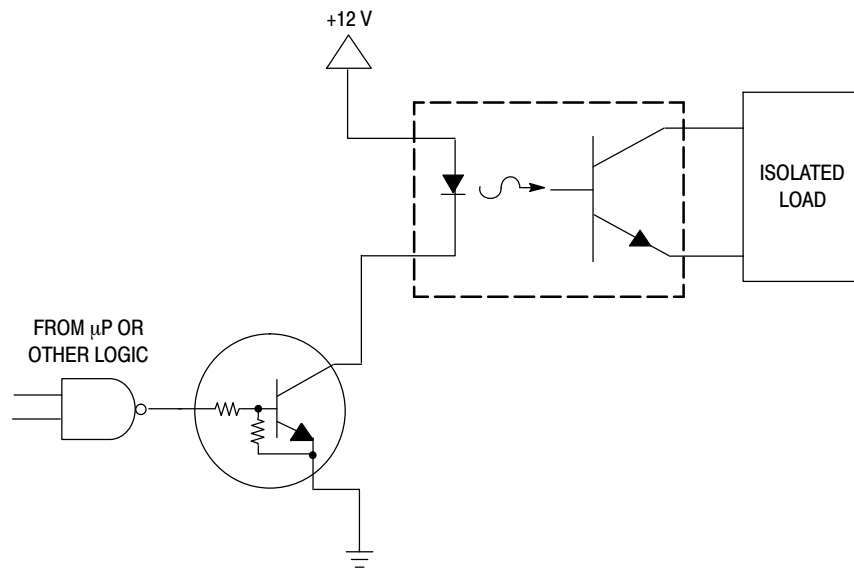


Figure 38. Level Shifter: Connects 12 or 24 Volt Circuits to Logic

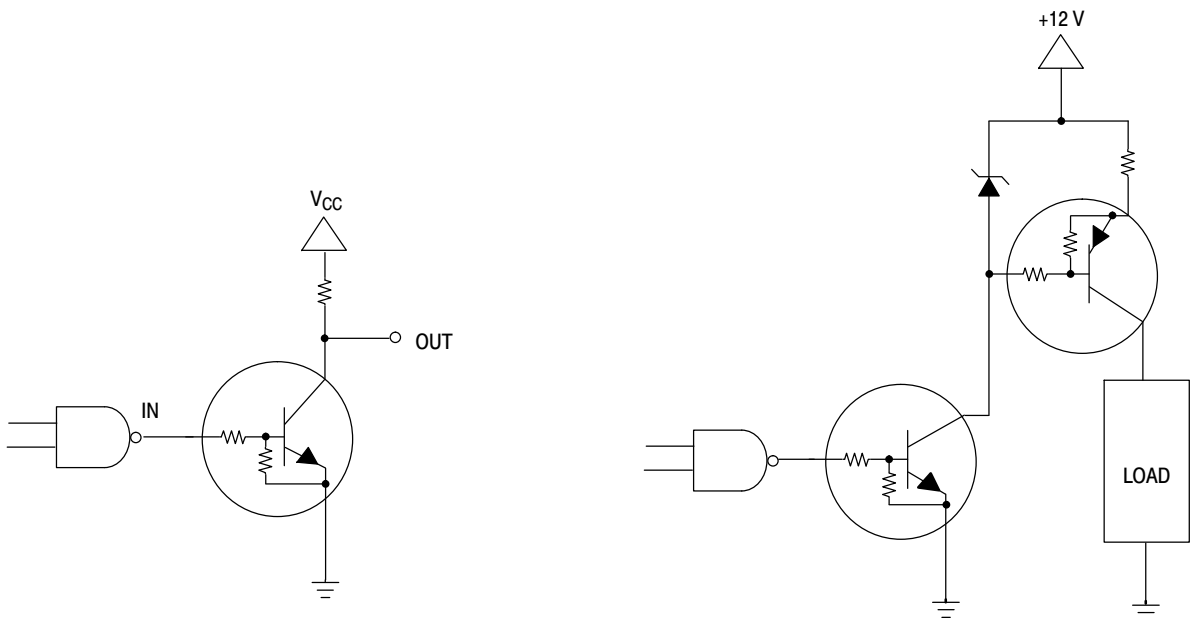


Figure 39. Open Collector Inverter:
Inverts the Input Signal

Figure 40. Inexpensive, Unregulated Current Source

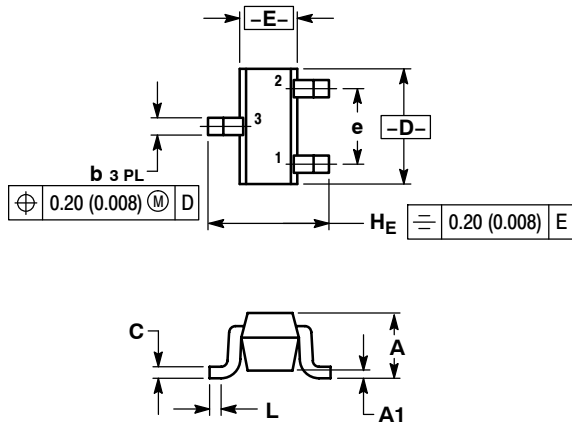
DTC114EET1 Series, SDTC114EET1 Series

PACKAGE DIMENSIONS

SC-75/SOT-416

CASE 463

ISSUE F



NOTES:

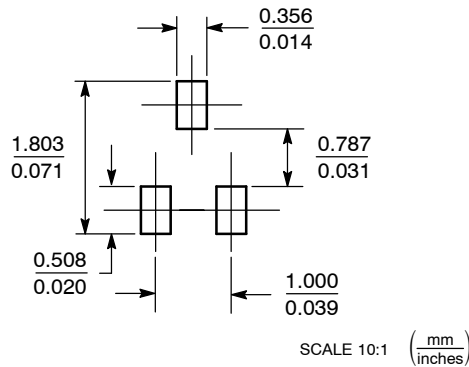
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.80	0.90	0.027	0.031	0.035
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.15	0.20	0.30	0.006	0.008	0.012
C	0.10	0.15	0.25	0.004	0.006	0.010
D	1.55	1.60	1.65	0.059	0.063	0.067
E	0.70	0.80	0.90	0.027	0.031	0.035
e	1.00 BSC			0.04 BSC		
L	0.10	0.15	0.20	0.004	0.006	0.008
H _E	1.50	1.60	1.70	0.061	0.063	0.065

STYLE 1:

- PIN 1. BASE
2. EMITTER
3. COLLECTOR

SOLDERING FOOTPRINT*



SCALE 10:1 (mm/inches)

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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