SMALL SIGNAL COMPLEMENTARY PRE-BIASED DUAL TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface Mount Package Suited for Automated Assembly
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Part Number	R1 (NOM)	R2 (NOM)
DCX124EU	22KΩ	22KΩ
DCX144EU	47KΩ	47KΩ
DCX114YU	10KΩ	47KΩ
DCX123JU	2.2KΩ	47KΩ
DCX114EU	10KΩ	10KΩ
DCX143EU	4.7KΩ	4.7KΩ

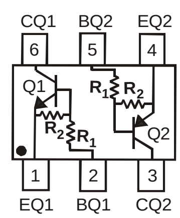
Mechanical Data

- Case: SOT363
- Case material: Molded Plastic. "Green" Molding Compound.
- Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.006 grams (approximate)

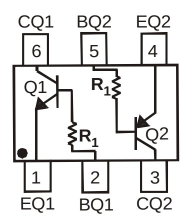
Part Number	R1 Only
DCX143TU	4.7KΩ
DCX114TU	10KΩ

SOT363

Top View



R1, R2



R1 Only

Device Schematic

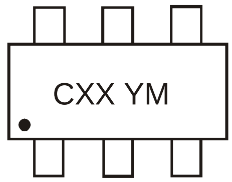
Ordering Information (Note 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DCX124EU-7-F	Commercial	C17	7	8	3,000
DCX124EUQ-7-F	Automotive	C17	7	8	3,000
DCX124EUQ-13-F	Automotive	C17	13	8	10,000
DCX124EUQ-13R-F	Automotive	C17	13	8	10,000
DCX144EU-7-F	Commercial	C20	7	8	3,000
DCX144EU-7R-F	Commercial	C20	7	8	3,000
DCX144EUQ-7-F	Automotive	C20	7	8	3,000
DCX114YU-7-F	Commercial	C14	7	8	3,000
DCX114YUQ-7-F	Automotive	C14	7	8	3,000
DCX114YUQ-13-F	Automotive	C14	13	8	10,000
DCX114YUQ-13R-F	Automotive	C14	13	8	10,000
DCX123JU-7-F	Commercial	C06	7	8	3,000
DCX114EU-7-F	Commercial	C13	7	8	3,000
DCX114EUQ-7-F	Automotive	C13	7	8	3,000
DCX114EUQ-13-F	Automotive	C13	13	8	10,000
DCX143TU-7-F	Commercial	C07	7	8	3,000
DCX143EU-7-F	Commercial	C08	7	8	3,000
DCX114TU-7-F	Commercial	C12	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
3. -7R and -13R are parts rotated in the pocket tape by 180°. For packaging details, go to our website at http://www.diodes.com.
4. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

© Diodes Incorporated

Marking Information



CXX = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: X = 2010)
M = Month (ex: 9 = September)

Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016	2017
Code	X	Y	Z	A	B	C	D	E

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings NPN Section @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (6) to (1)>		V_{CC}	50	V
Input Voltage <Pin: (2) to (1)>	DCX124EU	V_{IN}	-10 to +40	V
	DCX144EU		-10 to +40	
	DCX114YU		-6 to +40	
	DCX123JU		-5 to +12	
	DCX114EU		-10 to +40	
	DCX143TU		-5V max	
	DCX143EU		-10 to +30	
	DCX114TU		-5V max	
Output Current	DCX124EU	I_O	30	mA
	DCX144EU		30	
	DCX114YU		70	
	DCX123JU		100	
	DCX114EU		50	
	DCX143TU		100	
	DCX143EU		100	
	DCX114TU		100	
Output Current		I_C (Max)	100	mA

Maximum Ratings PNP Section @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (4) to (3)>		V_{CC}	50	V
Input Voltage <Pin: (5) to (4)>	DCX124EU	V_{IN}	+10 to -40	V
	DCX144EU		+10 to -40	
	DCX114YU		+6 to -40	
	DCX123JU		+5 to -12	
	DCX114EU		+10 to -40	
	DCX143TU		+5V max	
	DCX143EU		+10 to -30	
	DCX114TU		+5V max	
Output Current	DCX124EU	I_O	-30	mA
	DCX144EU		-30	
	DCX114YU		-70	
	DCX123JU		-100	
	DCX114EU		-50	
	DCX143TU		-100	
	DCX143EU		-100	
	DCX114TU		-100	
Output Current		I_C (Max)	-100	mA

© Diodes Incorporated

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5 & 6)	P_D	100	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout
6. 150mW per element must not be exceeded.

Electrical Characteristics NPN Section @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
R1 Only (DCX143TU & DCX114TU)							
Collector-Base Breakdown Voltage		BV_{CBO}	50	—	—	V	I_C = 50µA
Collector-Emitter Breakdown Voltage		BV_{CEO}	50	—	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage		BV_{EBO}	5	—	—	V	I_E = 50µA
Collector Cutoff Current		I_{CBO}	—	—	0.5	µA	V_{CB} = 50V
Emitter Cutoff Current		I_{EBO}	—	—	0.5	µA	V_{EB} = 4V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.3	V	I_C/I_B = 2.5mA / 0.25mA DCX143TU I_C/I_B = 1mA / 0.1mA DCX114TU
DC Current Transfer Ratio		h_{FE}	100	250	600	—	I_C = 1mA, V_{CE} = 5V
Input Resistor (R_1) Tolerance		ΔR_1	-30	—	+30	%	—
Gain-Bandwidth Product		f_T	—	250	—	MHz	V_{CE} = 10V, I_E = -5mA, f = 100MHz
R1/R2 Only							
Input Voltage	DCX124EU	$V_{I(off)}$	0.5	1.1	—	V	V_{CC} = 5V, I_O = 100µA
	DCX144EU		0.5	1.1			
	DCX114YU		0.3	-			
	DCX123JU		0.5	-			
	DCX114EU		0.5	1.1			
	DCX143EU		0.5	1.16			
	DCX124EU	$V_{I(on)}$	—	1.9	3.0		V_O = 0.3, I_O = 5mA
	DCX144EU			1.9	3.0		V_O = 0.3, I_O = 2mA
	DCX114YU			-	1.4		V_O = 0.3, I_O = 1mA
	DCX123JU			-	1.1		V_O = 0.3, I_O = 5mA
	DCX114EU			1.9	3.0		V_O = 0.3, I_O = 10mA
	DCX143EU			1.99	3.0		V_O = 0.3, I_O = 20mA
Output Voltage	DCX124EU	$V_{O(on)}$	—	0.1	0.3	V	I_O/I_I = 10mA / 0.5mA
	DCX144EU						I_O/I_I = 10mA / 0.5mA
	DCX114YU						I_O/I_I = 5mA / 0.25mA
	DCX123JU						I_O/I_I = 5mA / 0.25mA
	DCX114EU						I_O/I_I = 10mA / 0.5mA
	DCX143EU						I_O/I_I = 10mA / 0.5mA
Input Current	DCX124EU	I_I	—	—	0.36	mA	V_I = 5V
	DCX144EU				0.18		
	DCX114YU				0.88		
	DCX123JU				3.6		
	DCX114EU				0.88		
	DCX143EU				0.88		
Output Current		$I_{O(off)}$	—	—	0.5	µA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DCX124EU	G_I	56	—	—	—	V_O = 5V, I_O = 5mA
	DCX124EUQ		60				V_O = 5V, I_O = 5mA
	DCX144EU		68				V_O = 5V, I_O = 5mA
	DCX114YU		68				V_O = 5V, I_O = 10mA
	DCX114YUQ		80				V_O = 5V, I_O = 10mA
	DCX123JU		80				V_O = 5V, I_O = 10mA
	DCX114EU		30				V_O = 5V, I_O = 5mA
	DCX143EU		50				V_O = 5V, I_O = 10mA
Input Resistor (R_1) Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		R_2/R_1	-20	—	+20	%	—
Gain-Bandwidth Product		f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

© Diodes Incorporated

Electrical Characteristics PNP Section @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
R1 Only (DCX143TU & DCX114TU)							
Collector-Base Breakdown Voltage		BV_{CBO}	-50	—	—	V	I_C = -50µA
Collector-Emitter Breakdown Voltage		BV_{CEO}	-50	—	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	—	—	V	I_E = -50µA
Collector Cutoff Current		I_{CBO}	—	—	-0.5	µA	V_{CB} = -50V
Emitter Cutoff Current		I_{EBO}	—	—	-0.5	µA	V_{EB} = -4V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	-0.3	V	I_C/I_B = 2.5mA / 0.25mA DCX143TU I_C/I_B = 1mA / 0.1mA DCX114TU
DC Current Transfer Ratio		h_{FE}	100	250	600	—	I_C = -1mA, V_{CE} = -5V
Input Resistor (R_1) Tolerance		ΔR_1	-30	—	+30	%	—
Gain-Bandwidth Product		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz
R1/R2 Only							
Input Voltage	DCX124EU	$V_{I(off)}$	-0.5	-1.1	—	V	V_{CC} = -5V, I_O = -100µA
	DCX144EU		-0.5	-1.1			
	DCX114YU		-0.3	-			
	DCX123JU		-0.5	-			
	DCX114EU		-0.5	-1.1			
	DCX143EU		-0.5	-1.16			
	DCX124EU	$V_{I(on)}$	—	-1.9	-3.0		V_O = -0.3, I_O = -5mA
	DCX144EU			-1.9	-3.0		V_O = -0.3, I_O = -2mA
	DCX114YU			-	-1.4		V_O = -0.3, I_O = -1mA
	DCX123JU			-	-1.1		V_O = -0.3, I_O = -5mA
	DCX114EU			-1.9	-3.0		V_O = -0.3, I_O = -10mA
	DCX143EU			-2.5	-3.0		V_O = -0.3, I_O = -20mA
Output Voltage	DCX124EU	$V_{O(on)}$	—	-0.1	-0.3	V	I_O/I_I = -10mA / -0.5mA
	DCX144EU						I_O/I_I = -10mA / -0.5mA
	DCX114YU						I_O/I_I = -5mA / -0.25mA
	DCX123JU						I_O/I_I = -5mA / -0.25mA
	DCX114EU						I_O/I_I = -10mA / -0.5mA
	DCX143EU						I_O/I_I = -10mA / -0.5mA
Input Current	DCX124EU	I_I	—	—	-0.36	mA	V_I = -5V
	DCX144EU				-0.18		
	DCX114YU				-0.88		
	DCX123JU				-3.6		
	DCX114EU				-0.88		
	DCX143EU				-0.88		
Output Current		$I_{O(off)}$	—	—	-0.5	µA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DCX124EU	G_I	56	—	—	—	V_O = -5V, I_O = -5mA
	DCX124EUQ		60				V_O = -5V, I_O = -5mA
	DCX144EU		68				V_O = -5V, I_O = -5mA
	DCX114YU		68				V_O = -5V, I_O = -10mA
	DCX114YUQ		80				V_O = -5V, I_O = -10mA
	DCX123JU		80				V_O = -5V, I_O = -10mA
	DCX114EU		30				V_O = -5V, I_O = -5mA
	DCX143EU		40				V_O = -5V, I_O = -10mA
Input Resistor (R_1) Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		R_2/R_1	-20	—	+20	%	—
Gain-Bandwidth Product		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = -5mA, f = 100MHz

© Diodes Incorporated

Typical Curves – Total Device

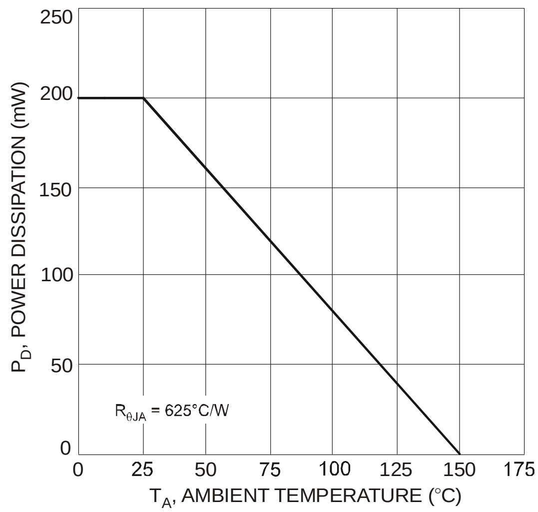


Fig. 1 Power Derating Curve

Typical Curves – DCX123JU PNP Section

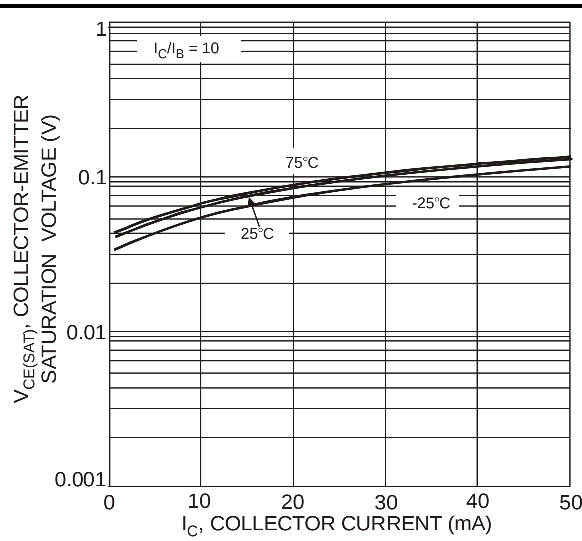


Fig. 2 Typical $V_{CE(SAT)}$ vs. I_C

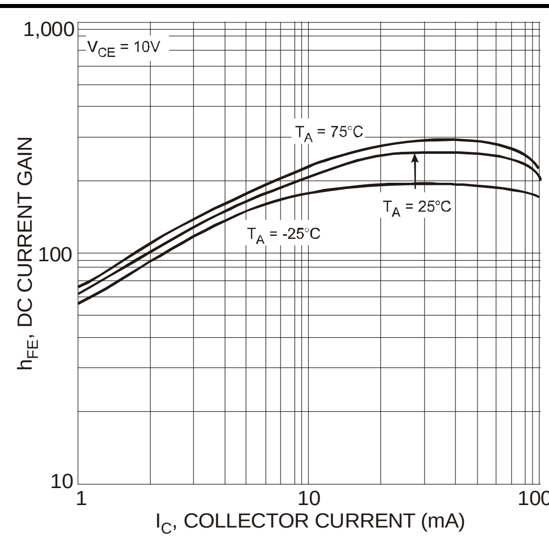


Fig. 3 Typical DC Current Gain

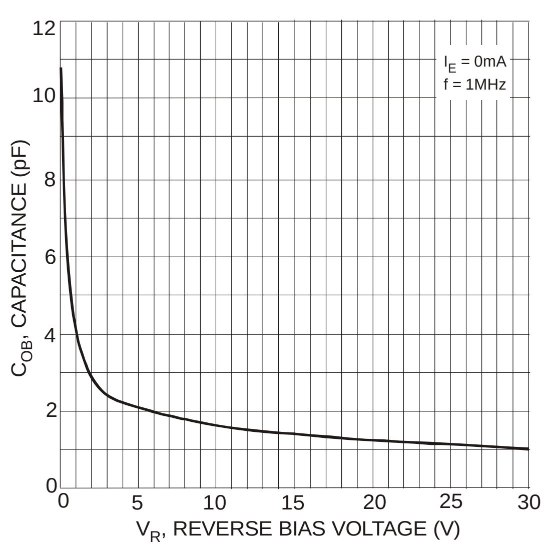


Fig. 4 Typical Output Capacitance

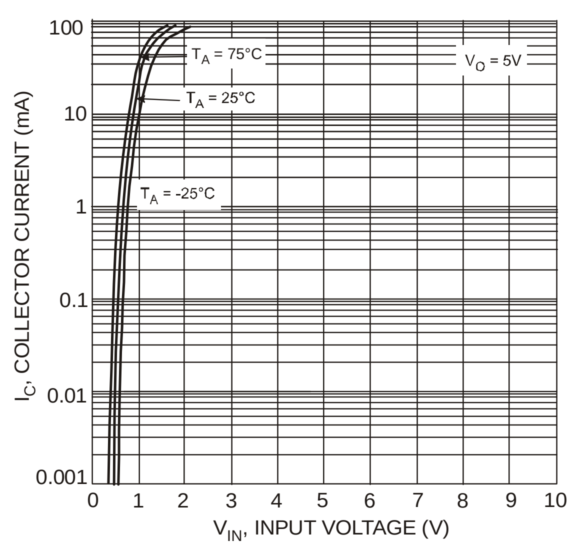


Fig. 5 Typical Collector Current vs. Input Voltage

© Diodes Incorporated

Typical Curves – DCX123JU PNP Section (cont.)

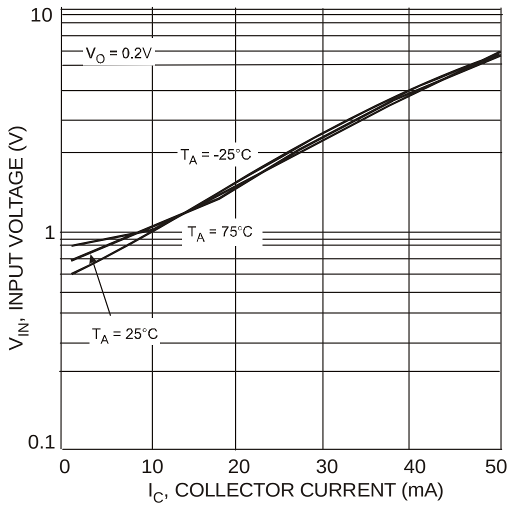


Fig. 6 Typical Input Voltage vs. Collector Current

Typical Curves – DCX123JU NPN Section

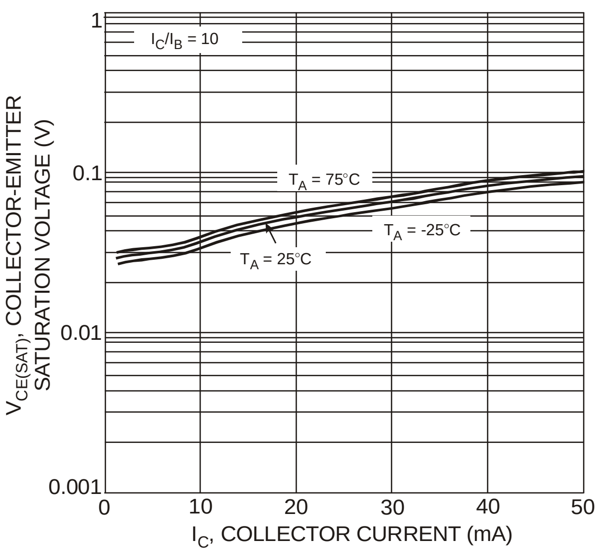


Fig. 7 Typical $V_{CE(SAT)}$ vs. I_C

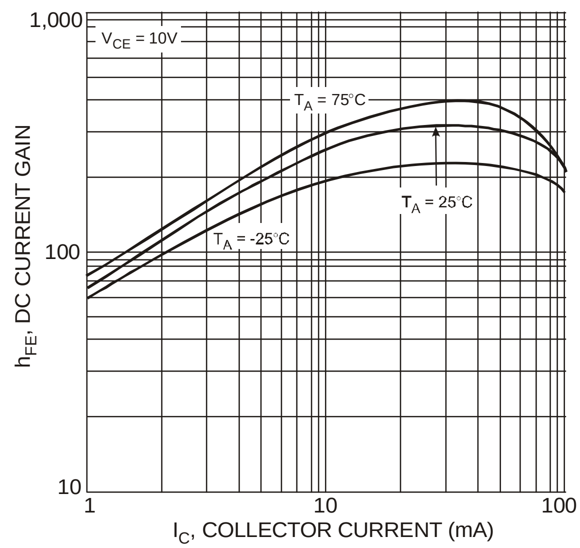


Fig. 8 Typical DC Current Gain

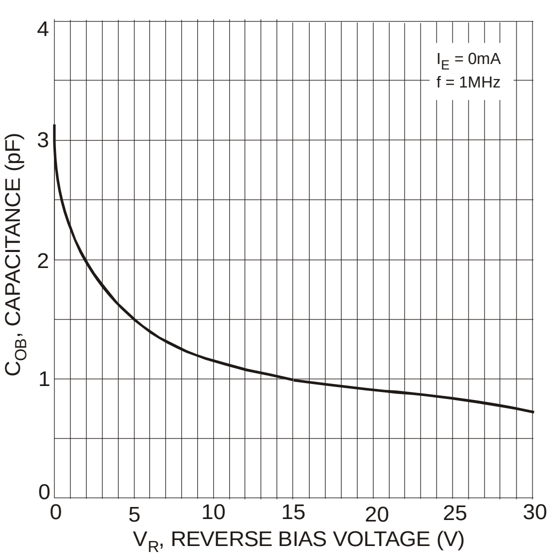


Fig. 9 Typical Output Capacitance

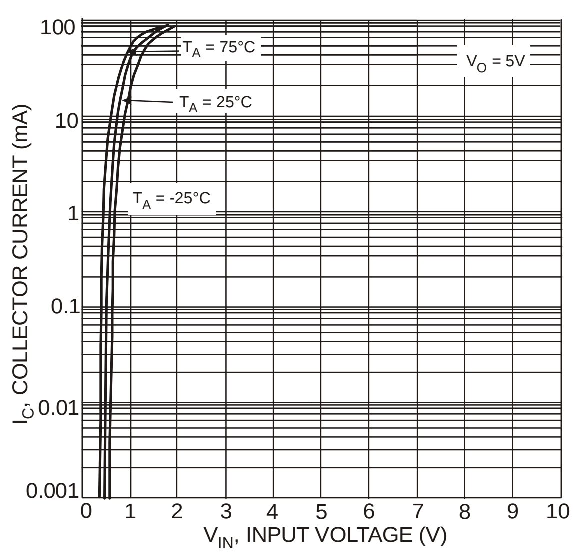


Fig. 10 Typical Collector Current vs. Input Voltage

© Diodes Incorporated

Typical Curves – DCX123JU NPN Section (cont.)

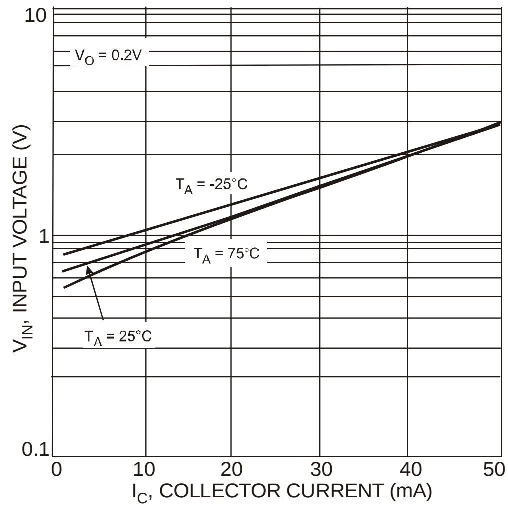


Fig. 11 Typical Input Voltage vs. Collector Current

Typical Curves – DCX143EU PNP Section

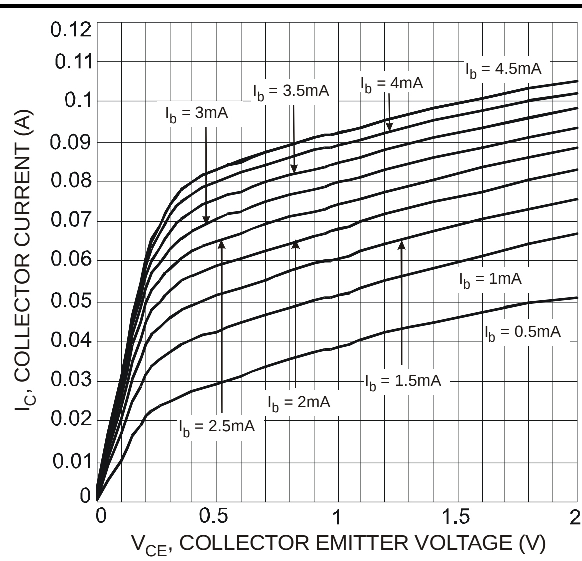


Fig. 12 Typical V_{CE} vs. I_C

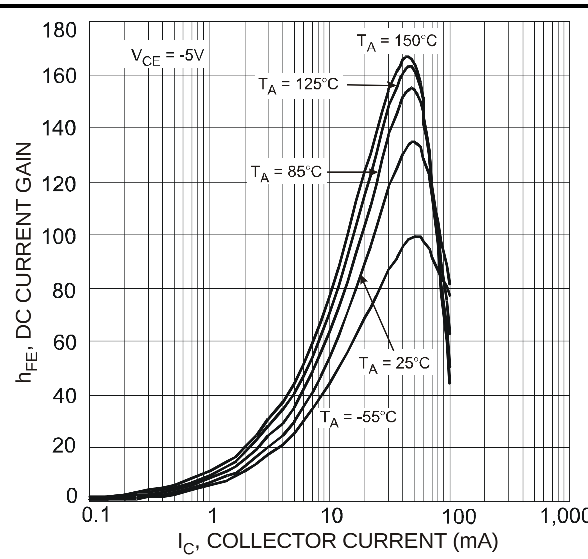


Fig. 13 Typical DC Current Gain

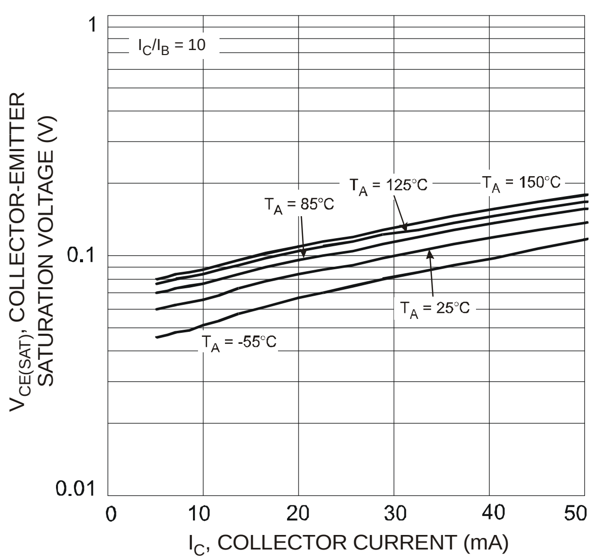


Fig. 14 Typical $V_{CE(SAT)}$ vs. I_C

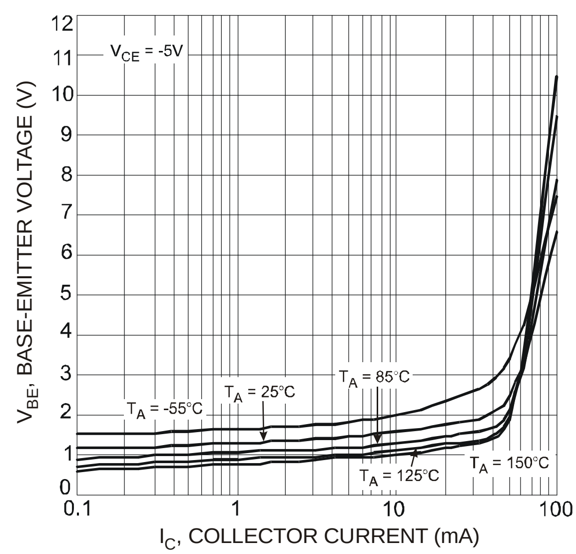


Fig. 15 Typical V_{BE} vs. I_C

© Diodes Incorporated

Typical Curves – DCX143EU PNP Section (cont.)

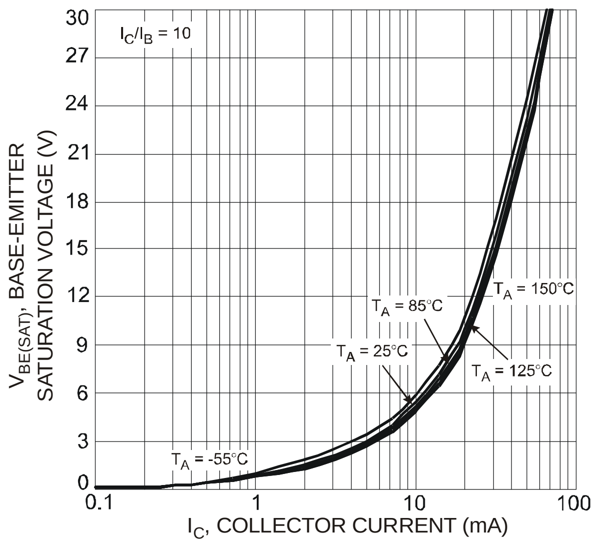


Fig. 16 Typical $V_{BE(SAT)}$ vs. I_C

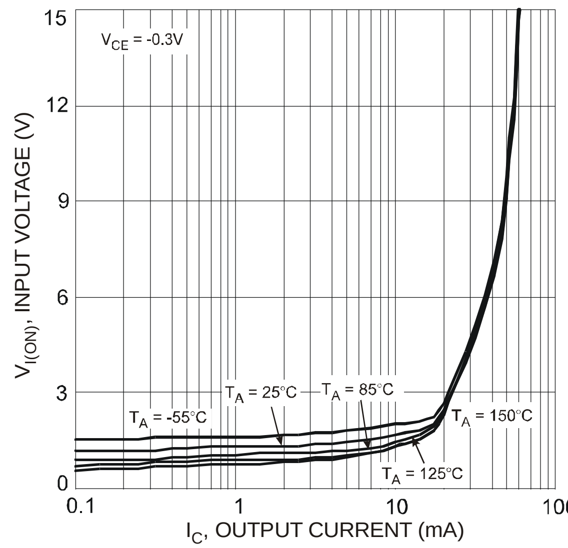


Fig. 17 Typical $V_{I(ON)}$ vs. I_C

Typical Curves – DCX143EU NPN Section

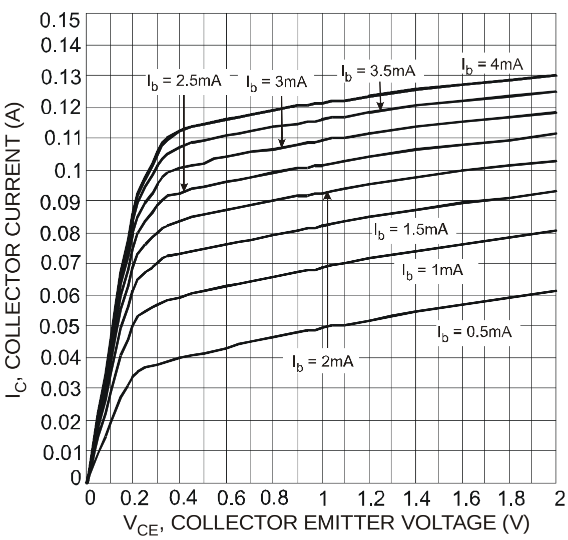


Fig. 18 Typical V_{CE} vs. I_C

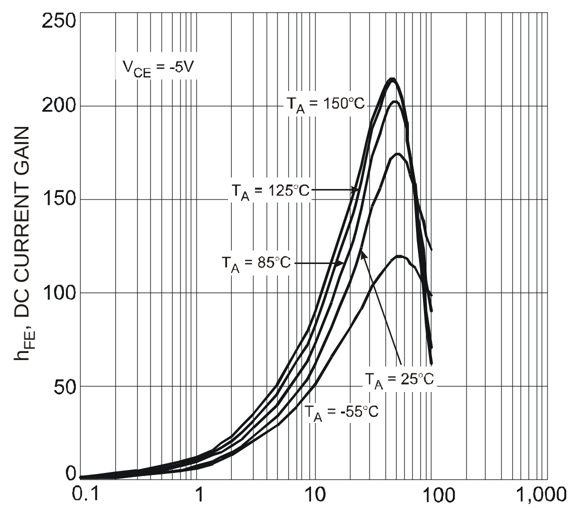


Fig. 19 Typical DC Current Gain

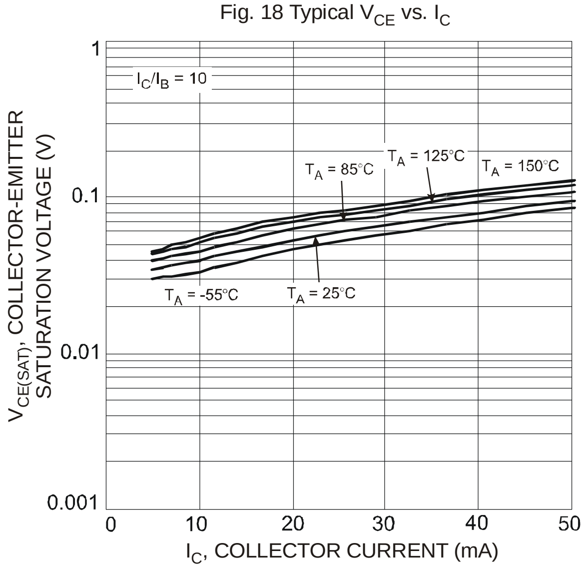


Fig. 20 Typical $V_{CE(SAT)}$ vs. I_C

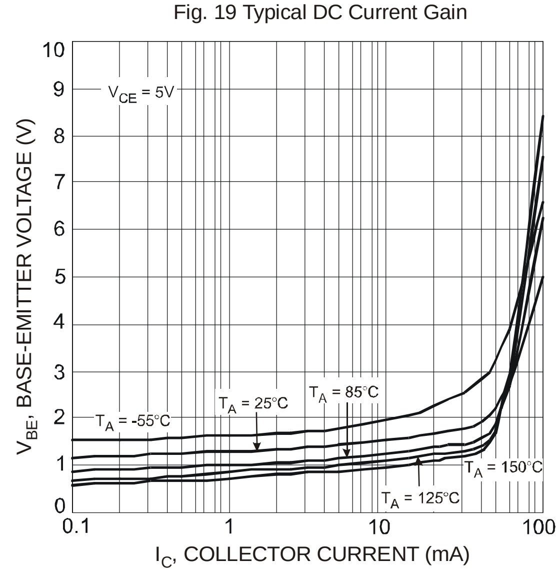


Fig. 21 Typical V_{BE} vs. I_C

© Diodes Incorporated

Typical Curves – DCX143EU NPN Section (cont.)

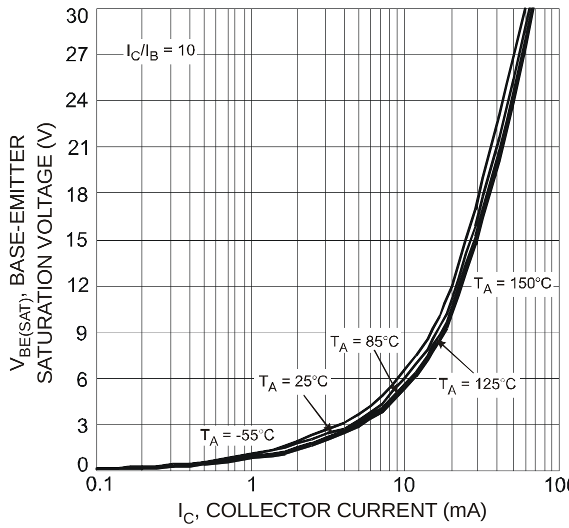


Fig. 22 Typical $V_{BE(SAT)}$ vs. I_C

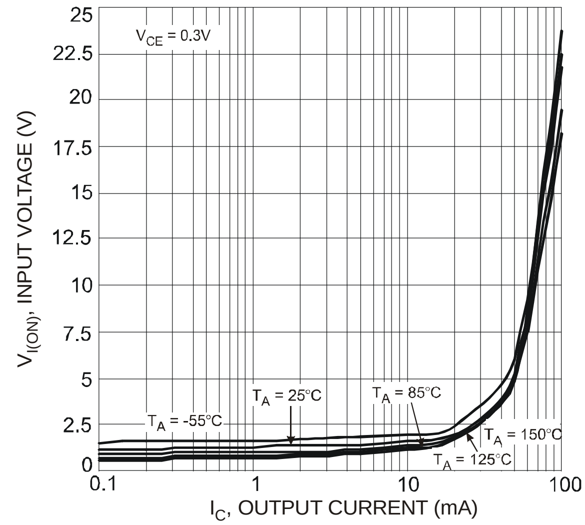


Fig. 23 Typical $V_{I(ON)}$ vs. I_C

Typical Curves – DCX114TU PNP Section

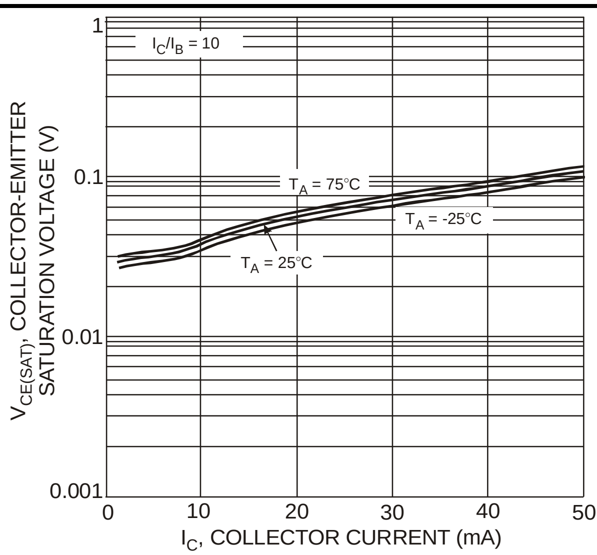


Fig. 24 Typical $V_{CE(SAT)}$ vs. I_C

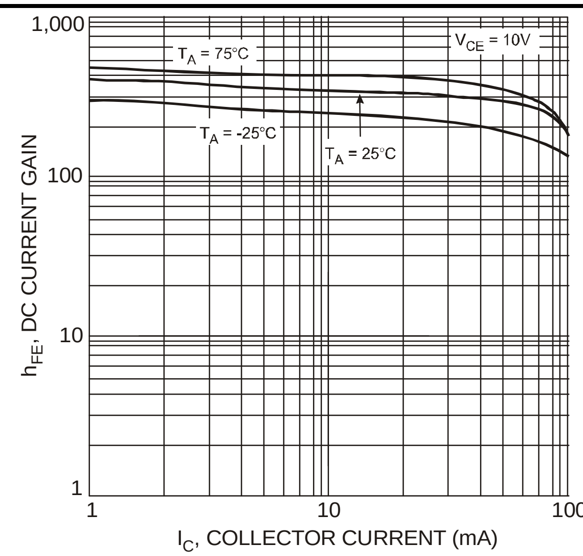


Fig. 25 Typical DC Current Gain

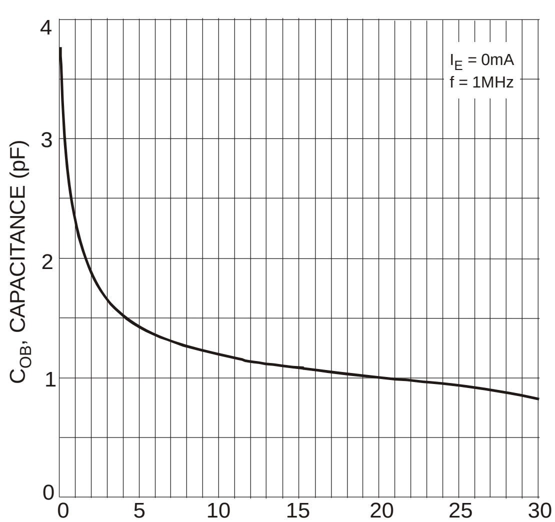


Fig. 26 Typical Output Capacitance

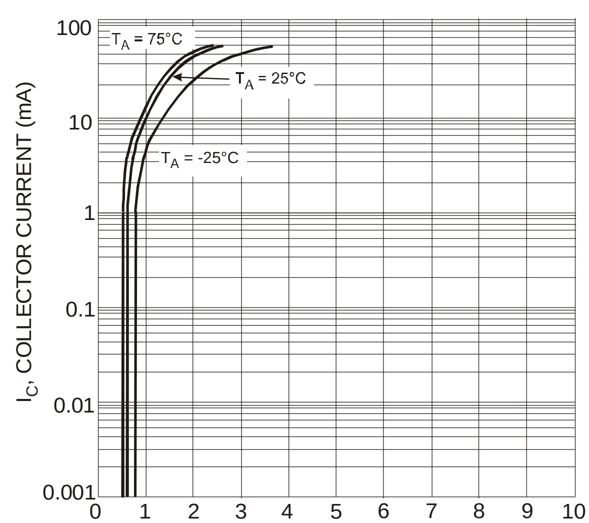


Fig. 27 Typical Collector Current vs. Input Voltage

© Diodes Incorporated

Typical Curves – DCX114TU PNP Section (cont.)

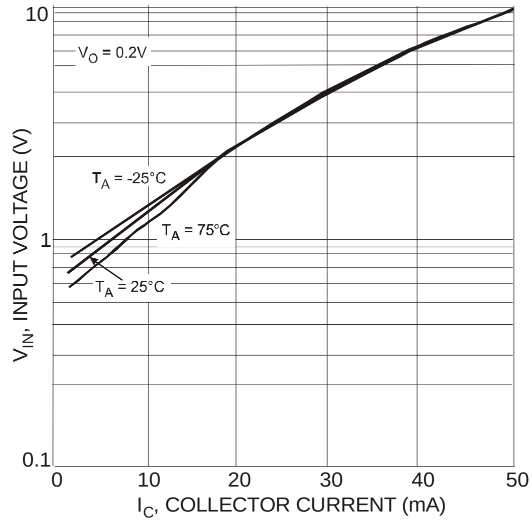


Fig. 28 Typical Input Voltage vs. Collector Current

Typical Curves – DCX114TU NPN Section

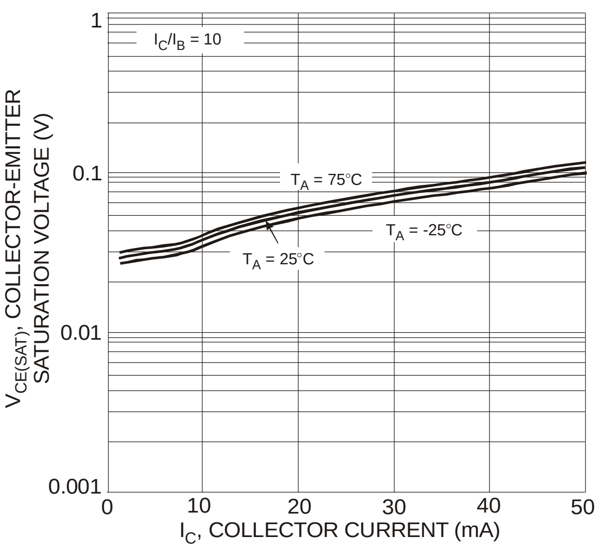


Fig. 29 Typical $V_{CE(SAT)}$ vs. I_C

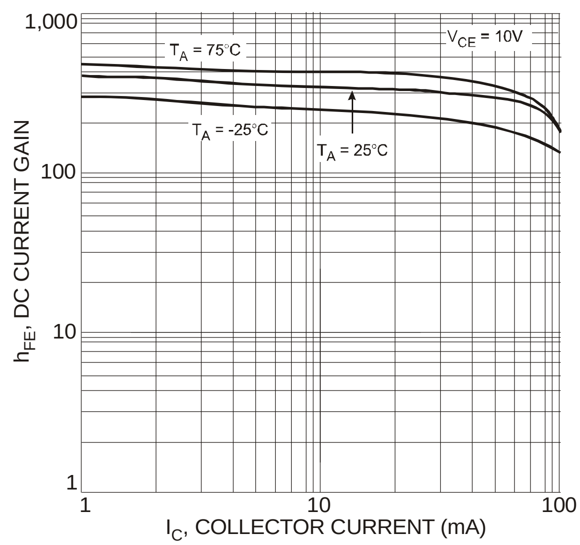


Fig. 30 Typical DC Current Gain

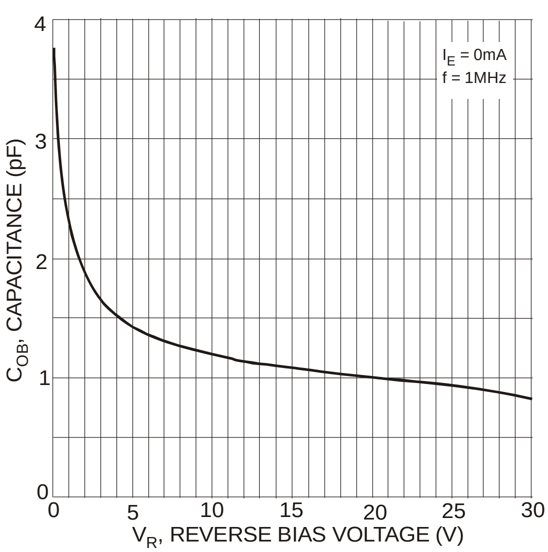


Fig. 31 Typical Output Capacitance

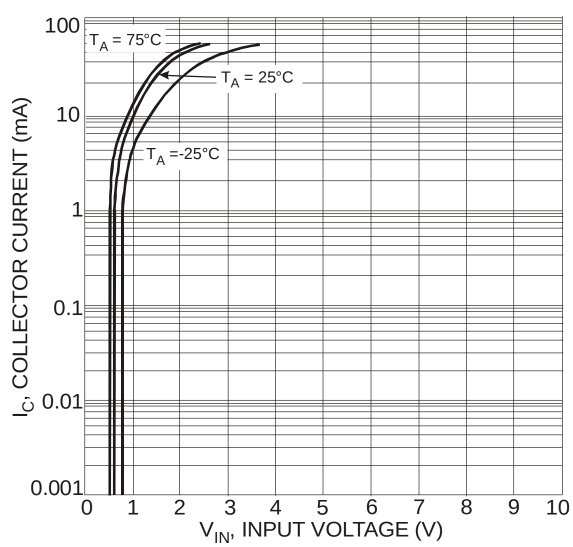


Fig. 32 Typical Collector Current vs. Input Voltage

© Diodes Incorporated

Typical Curves – DCX114TU NPN Section (cont.)

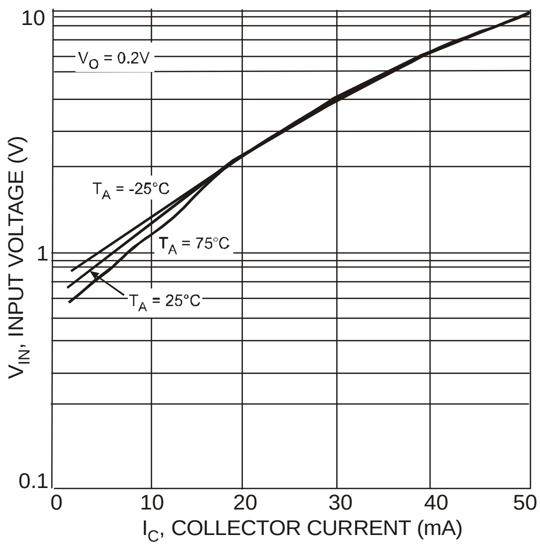
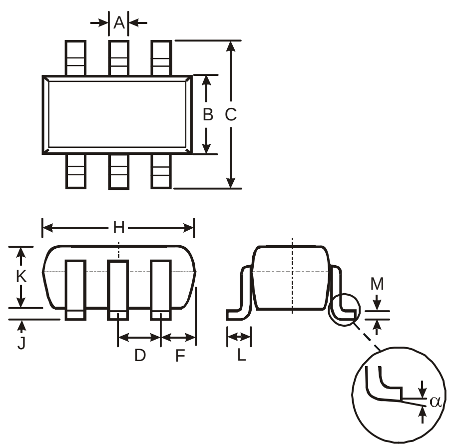


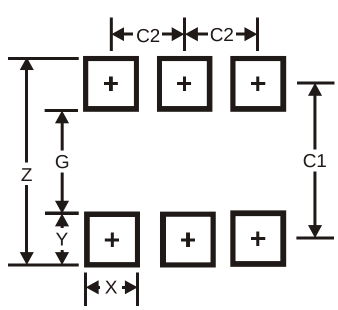
Fig. 33 Typical Input Voltage vs. Collector Current

Package Outline Dimensions



SOT363		
Dim	**Min**	**Max**
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

© Diodes Incorporated

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or

2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2012, Diodes Incorporated

www.diodes.com

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» — "LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru