DUAL COMPLEMENTARY PRE-BIASED TRANSISTOR

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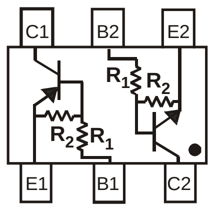
Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- **Available in Lead Free/RoHS Compliant Version (Note 1)**
- **"Green" Device (Note 2)**

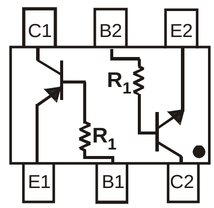
Part Number	R1	R2	Marking
DCX124EK	22KΩ	22KΩ	C17
DCX144EK	47KΩ	47KΩ	C20
DCX114YK	10KΩ	47KΩ	C14
DCX123JK	2.2KΩ	47KΩ	C06
DCX114EK	10KΩ	10KΩ	C13
DCX115EK	100KΩ	100KΩ	C15
DCX143TK	4.7KΩ	-	C07
DCX114TK	10KΩ	-	C12

Mechanical Data

- Case: SC-74R (Note 3)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Matte Tin Finish annealed over Copper leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Table and Page 11
- Ordering Information: See Page 11
- Weight: 0.015 grams (approximate)



R1, R2 Device Schematic



R1 only Device Schematic

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

Characteristic		Symbol	Value	Unit
Supply Voltage		V_{CC}	50	V
Input Voltage	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK DCX143TK DCX114TK	V_{IN}	-10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -10 to +40 -5V max -5V max	V
Output Current	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK DCX143TK DCX114TK	I_O	30 30 70 100 50 20 100 100	mA
Output Current	All	$I_{C(MAX)}$	100	mA

Thermal Characteristics NPN Section

Characteristic	Symbol	Value	Unit
Power Dissipation (Total) (Note 4)	P_D	300	mW
Thermal Resistance, Junction to Ambient Air (Note 4)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
3. SC-74R and SOT-26 have identical dimensions and the only difference is the location of the pin one indicator. Please see the individual device datasheets for exact details regarding the location of the pin one indicator.
4. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com/datasheets/ap02001.pdf. 200mW per element must not be exceeded.

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

Characteristic		Symbol	Value	Unit
Supply Voltage		V_{CC}	50	V
Input Voltage	DCX124EK	V_{IN}	+10 to –40	V
	DCX144EK		+10 to –40	
	DCX114YK		+6 to –40	
	DCX123JK		+5 to –12	
	DCX114EK		+10 to –40	
	DCX115EK		+10 to –40	
	DCX143TK		+5V max	
	DCX114TK		+5V max	
Output Current	DCX124EK	I_O	-30	mA
	DCX144EK		-30	
	DCX114YK		-70	
	DCX123JK		-100	
	DCX114EK		-50	
	DCX115EK		-20	
	DCX143TK		-100	
	DCX114TK		-100	
Output Current	All	$I_{C(MAX)}$	-100	mA

Thermal Characteristics PNP Section

Characteristic		Symbol	Value	Unit
Power Dissipation (Total)	(Note 4)	P_D	300	mW
Thermal Resistance, Junction to Ambient Air	(Note 4)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Characteristic (DDC143TK & DDC114TK only)	Symbol	Min	Typ	Max	Unit	Test Condition
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 – DCX143TK I_C/I_B = 1mA / 0.1mA – DCX114TK
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

* Transistor - For Reference Only

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK	$V_{I(OFF)}$	0.5 0.5 0.3 0.5 0.5 0.5	1.1 1.1 — — 1.1 1.1	—	V	V_{CC} = 5V, I_O = 100µA
	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK	$V_{I(ON)}$	—	1.65 1.9 — — 1.9 1.9	3.0 3.0 1.4 1.1 3.0 3.0	V	V_O = 0.3V, I_O = 5mA V_O = 0.3V, I_O = 2mA V_O = 0.3V, I_O = 1mA V_O = 0.3V, I_O = 5mA V_O = 0.3V, I_O = 10mA V_O = 0.3V, I_O = 1mA
Output Voltage	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK	$V_{O(ON)}$	—	0.1	0.3	V	I_O/I_I = 10mA / 0.5mA I_O/I_I = 10mA / 0.5mA I_O/I_I = 5mA / 0.25mA I_O/I_I = 5mA / 0.25mA I_O/I_I = 10mA / 0.5mA I_O/I_I = 5mA / 0.25mA
Input Current	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK	I_I	—	—	0.36 0.18 0.88 3.6 0.88 0.15	mA	V_I = 5V
Output Current		$I_{O(OFF)}$	—	—	0.5	µA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DCX124EK DCX144EK DCX114YK DCX123JK DCX114EK DCX115EK	G_I	80 68 68 80 30 82	—	—	—	V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA
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

* Transistor - For Reference Only

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

Characteristic (DCX143TK & DCX114TK only)	Symbol	Min	Typ	Max	Unit	Test Condition
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 - DCX143TK I_C/I_B = -1mA / -0.1mA - DCX114TK
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

* Transistor - For Reference Only

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX124EK	$V_{I(OFF)}$	-0.5	-1.1	—	V	V_{CC} = -5V, I_O = -100µA
	DCX144EK		-0.5	-1.1			
	DCX114YK		-0.3	—			
	DCX123JK		-0.5	—			
	DCX114EK		-0.5	–1.1			
	DCX115EK		-0.5	–1.1			
	DCX124EK	$V_{I(ON)}$	—	-1.9	-3.0	V	V_O = -0.3V, I_O = -5mA
	DCX144EK			-1.9	-3.0		V_O = -0.3V, I_O = -2mA
	DCX114YK			—	-1.4		V_O = -0.3V, I_O = -1mA
	DCX123JK			—	-1.1		V_O = -0.3V, I_O = -5mA
	DCX114EK			-1.9	-3.0		V_O = -0.3V, I_O = -10mA
	DCX115EK			-1.9	-3.0		V_O = -0.3V, I_O = -1mA
Output Voltage	DCX124EK	$V_{O(ON)}$	—	-0.1	-0.3	V	I_O/I_I = -10mA /-0.5mA
	DCX144EK						I_O/I_I = -10mA /-0.5mA
	DCX114YK						I_O/I_I = -5mA /-0.25mA
	DCX123JK						I_O/I_I = -5mA /-0.25mA
	DCX114EK						I_O/I_I = -10mA/-0.5mA
	DCX115EK						I_O/I_I = -5mA/-0.25mA
Input Current	DCX124EK	I_I	—	—	-0.36	mA	V_I = -5V
	DCX144EK				-0.18		
	DCX114YK				-0.88		
	DCX123JK				-3.6		
	DCX114EK				-0.88		
	DCX115EK				-0.15		
Output Current		$I_{O(OFF)}$	—	—	-0.5	µA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DCX124EK	G_I	80	—	—	—	V_O = -5V, I_O = -5mA
	DCX144EK		68				V_O = -5V, I_O = -5mA
	DCX114YK		68				V_O = -5V, I_O = -10mA
	DCX123JK		80				V_O = -5V, I_O = -10mA
	DCX114EK		30				V_O = -5V, I_O = -5mA
	DCX115EK		82				V_O = -5V, I_O = -5mA
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

*Transistor - For Reference Only

Typical Curves – Total Device

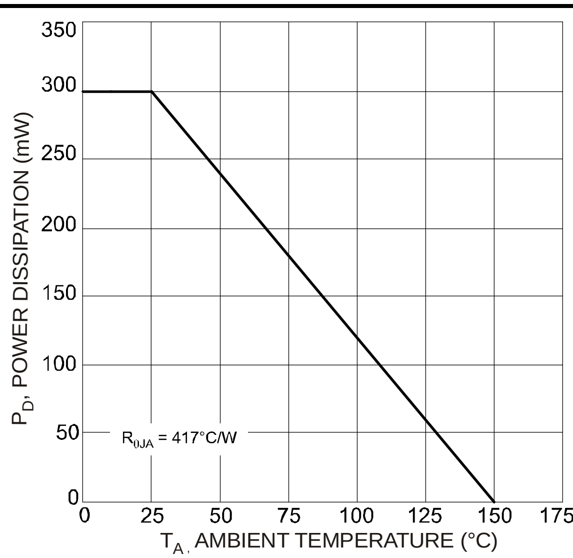


Fig. 1 Power Dissipation vs. Ambient Temperature

Typical Curves – DCX124EK PNP Section

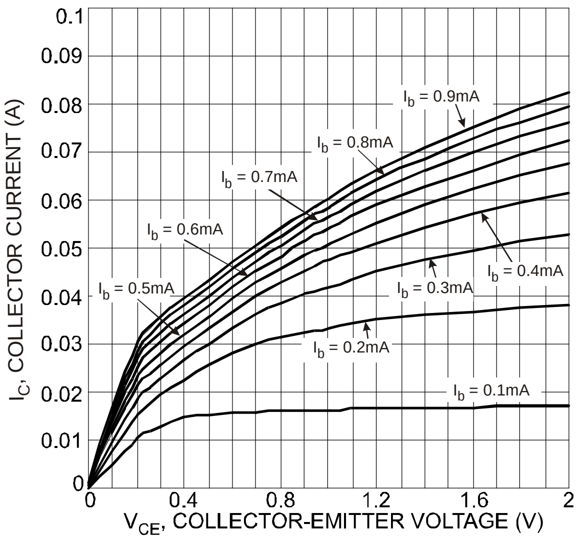


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

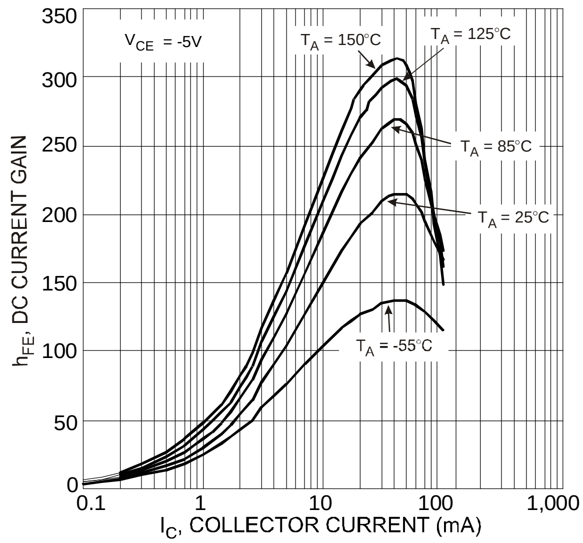


Fig. 3 Typical DC Current Gain vs. Collector Current

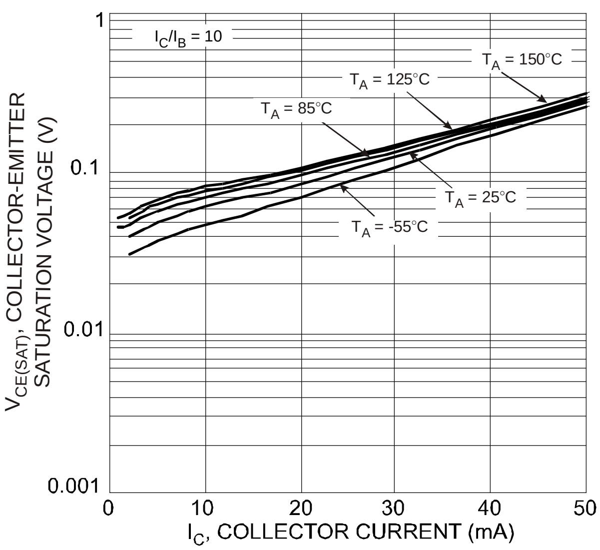


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

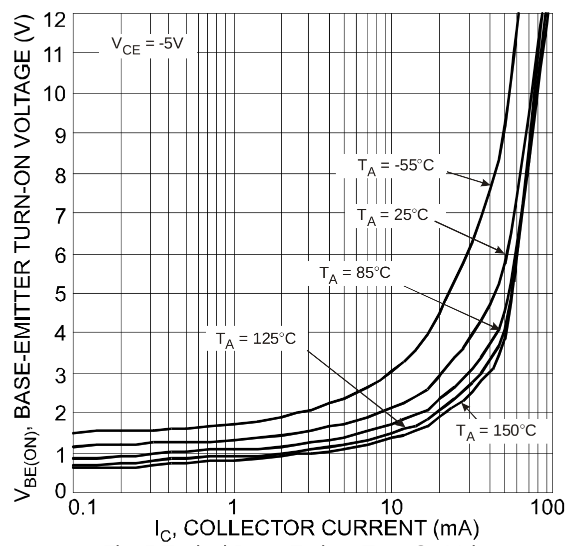


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

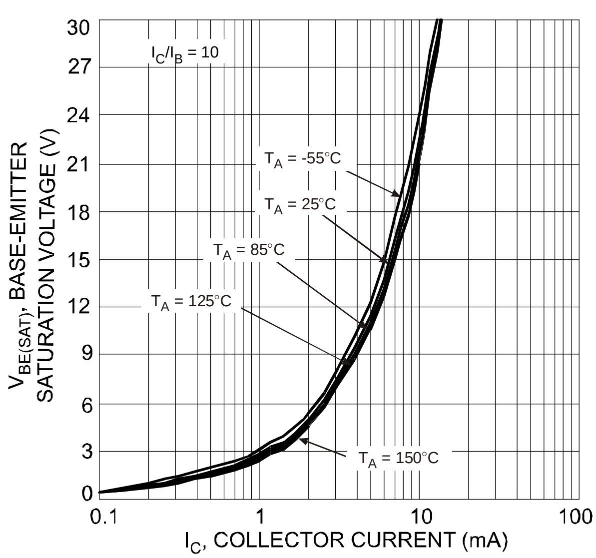


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

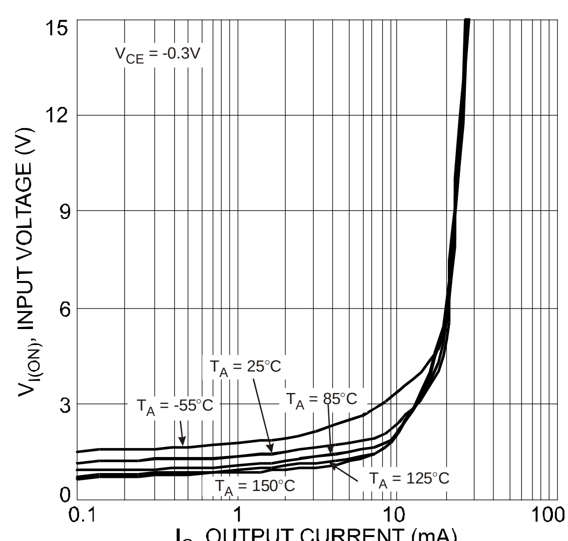


Fig. 7 $V_{I(ON)}$ vs. I_C

Typical Curves – DCX124EK NPN Section

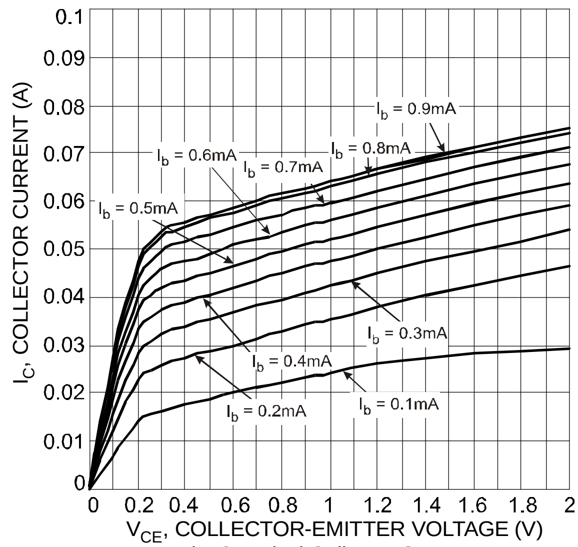


Fig. 8 Typical Collector Current vs. Collector-Emitter Voltage

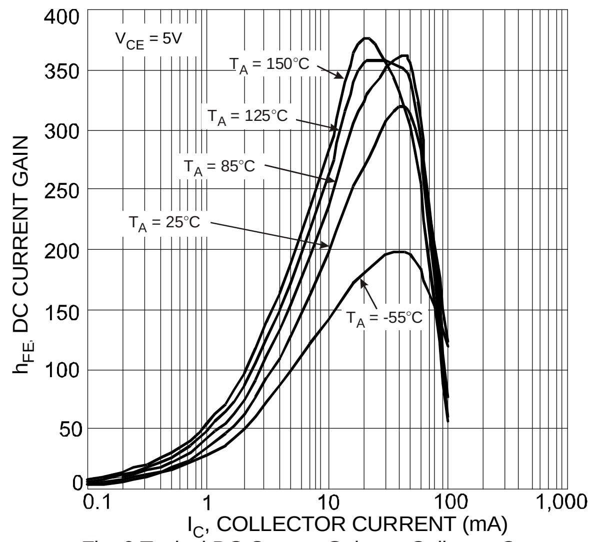


Fig. 9 Typical DC Current Gain vs. Collector Current

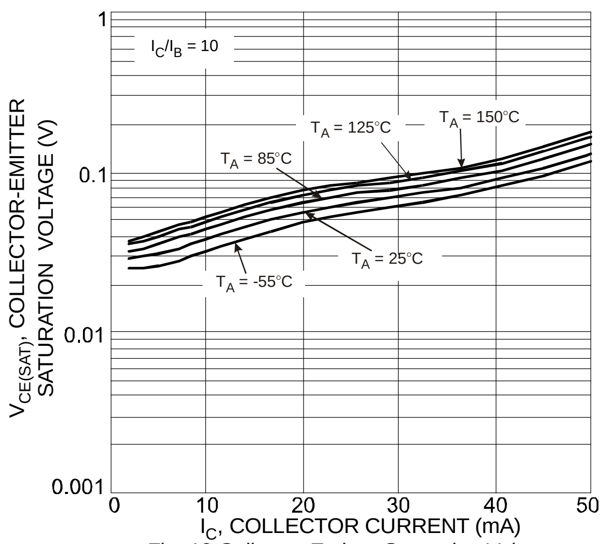


Fig. 10 Collector-Emitter Saturation Voltage vs. Collector Current

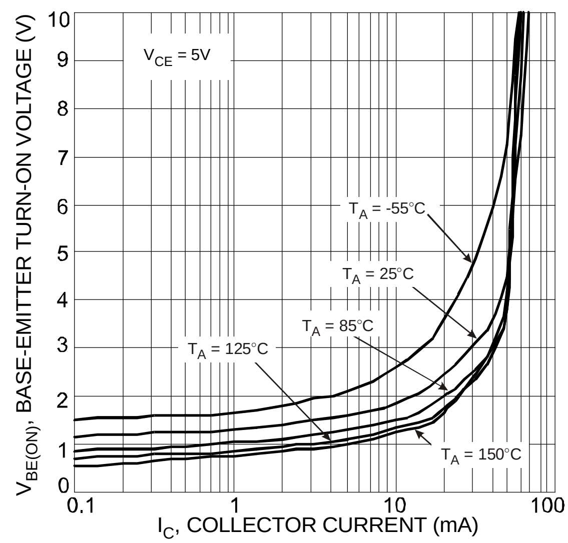


Fig. 11 Base-Emitter Turn-On Voltage vs. Collector Current

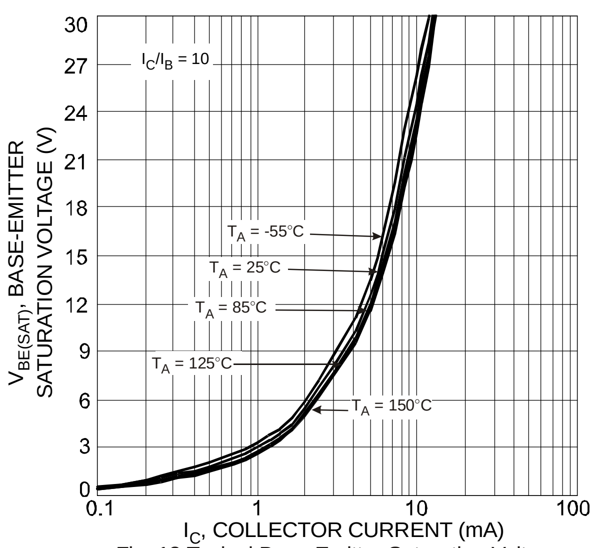


Fig. 12 Typical Base-Emitter Saturation Voltage vs. Collector Current

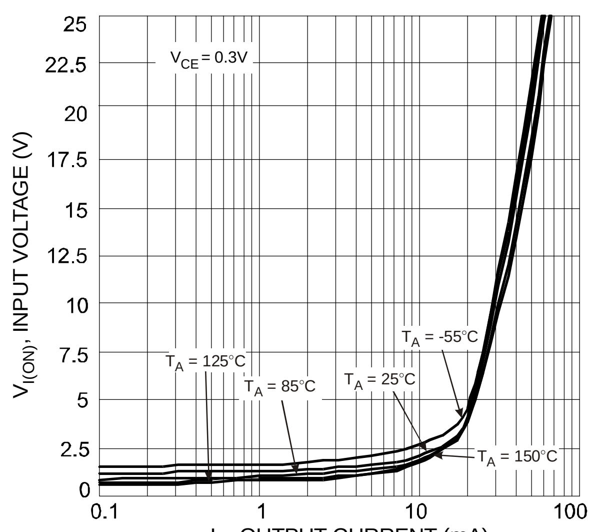


Fig. 13 $V_{I(ON)}$ vs. I_C

Typical Curves – DCX123JK   PNP Section

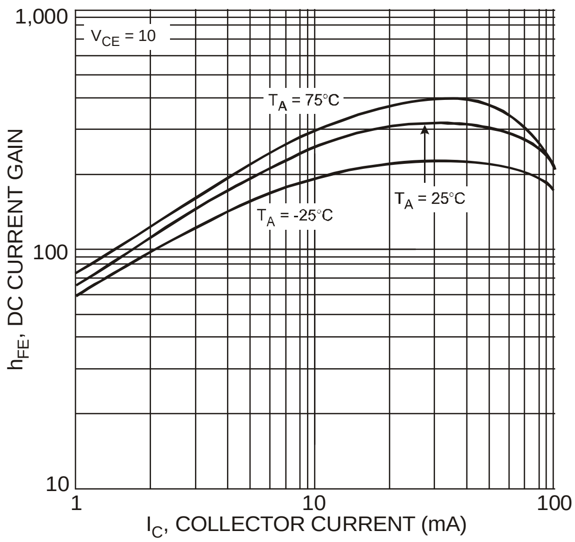


Fig. 14 Typical DC Current Gain vs. Collector Current

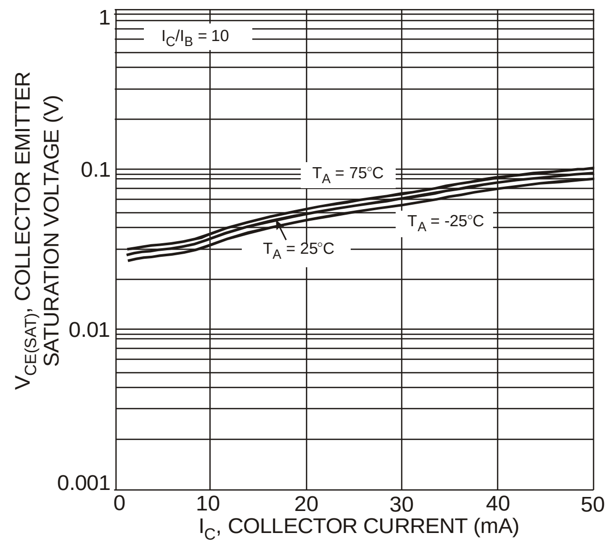


Fig. 15 Typical Collector Emitter Saturation Voltage vs. Collector Current

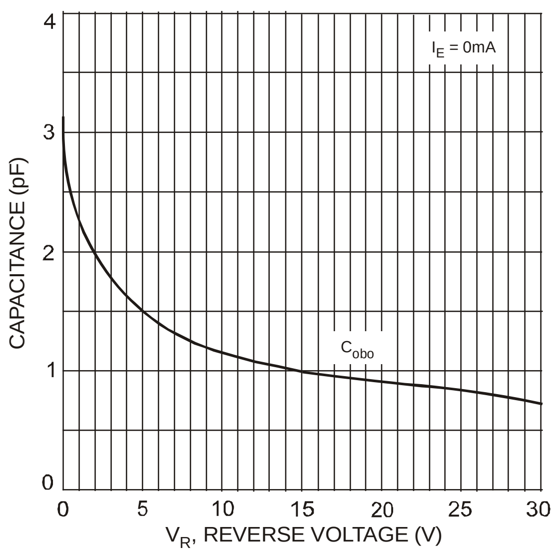


Fig. 16 Typical Capacitance Characteristics

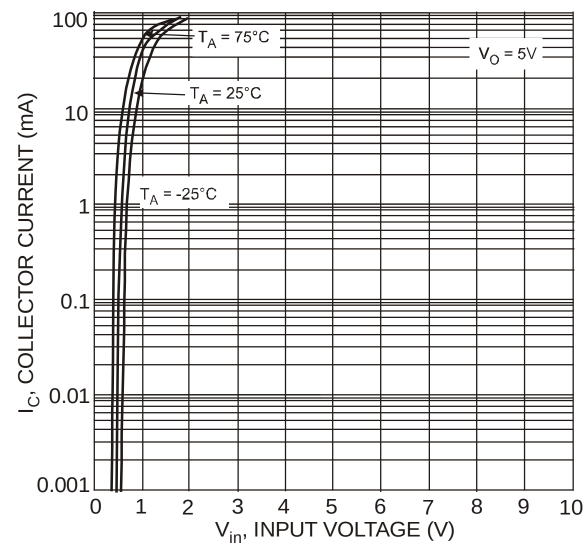


Fig. 17 Collector Current vs. Input Voltage

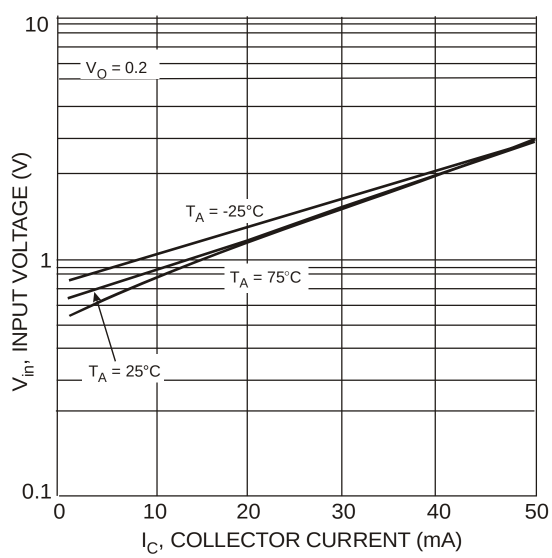


Fig. 18 Input Voltage vs. Collector Current

Typical Curves – DCX123JK NPN Section

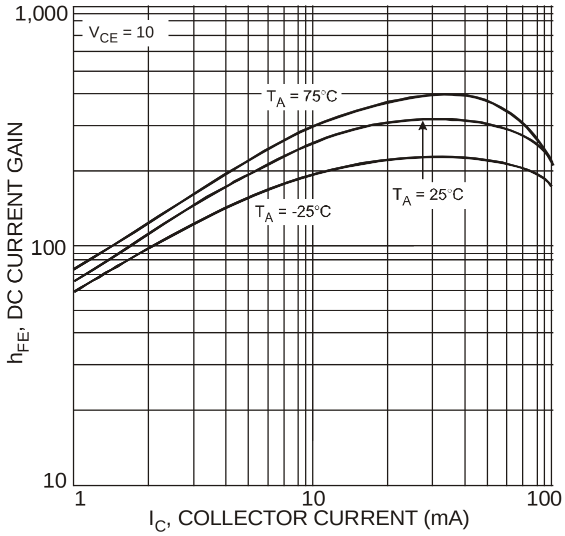


Fig. 19 Typical DC Current Gain vs. Collector Current

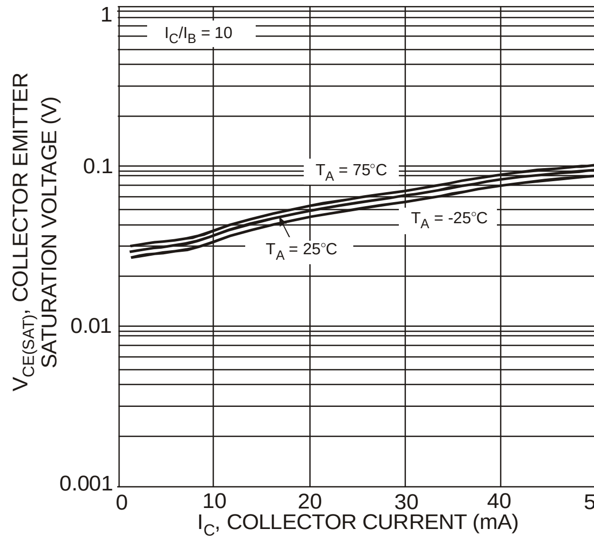


Fig. 20 Collector Emitter Saturation Voltage vs. Collector Current

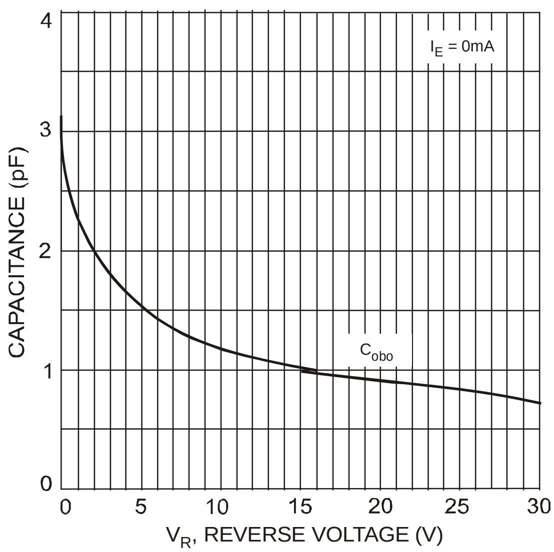


Fig. 21 Typical Capacitance Characteristics

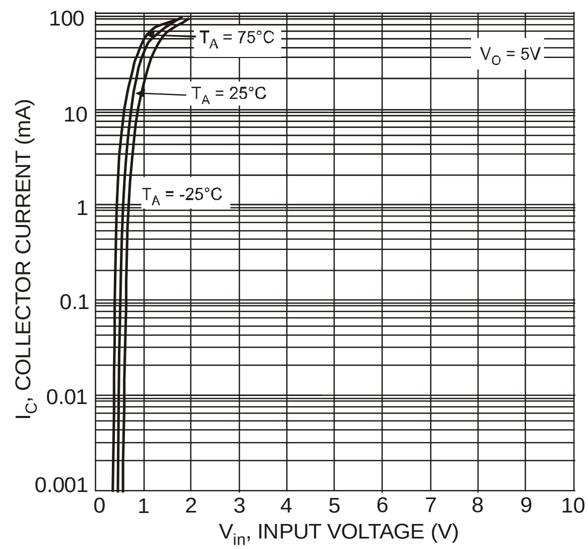


Fig. 22 Collector Current vs. Input Voltage

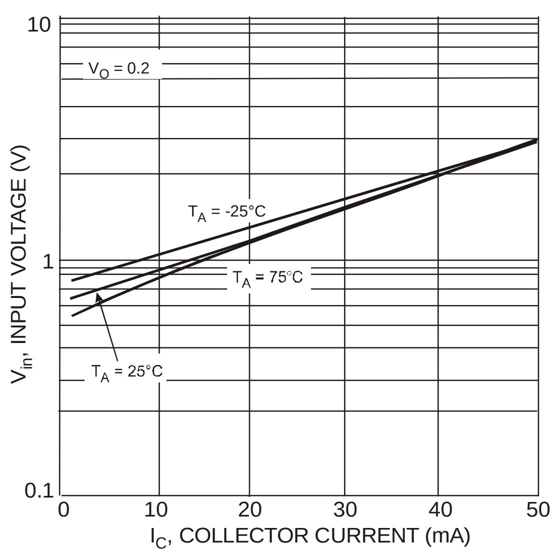


Fig. 23 Input Voltage vs. Collector Current

Typical Curves – DCX114TK PNP Section

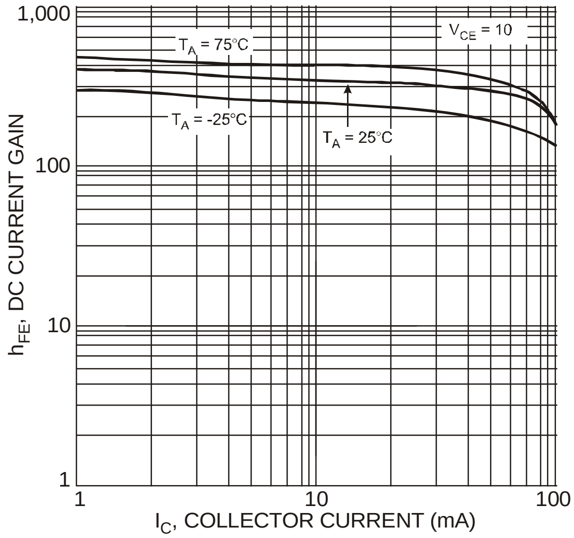


Fig. 24 Typical DC Current Gain vs. Collector Current

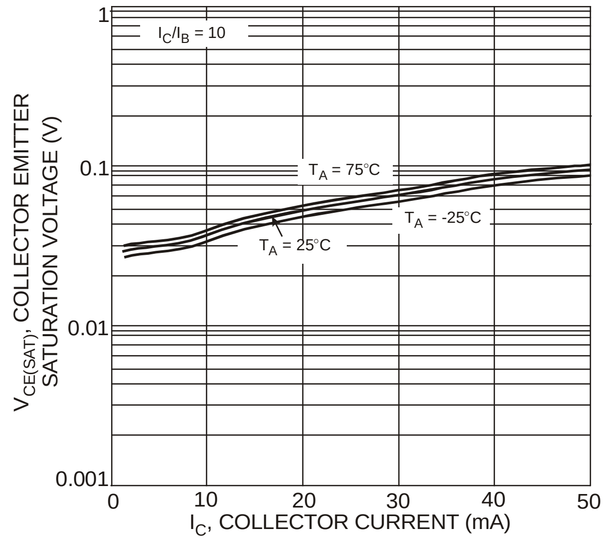


Fig. 25 Typical Collector Emitter Saturation Voltage vs. Collector Current

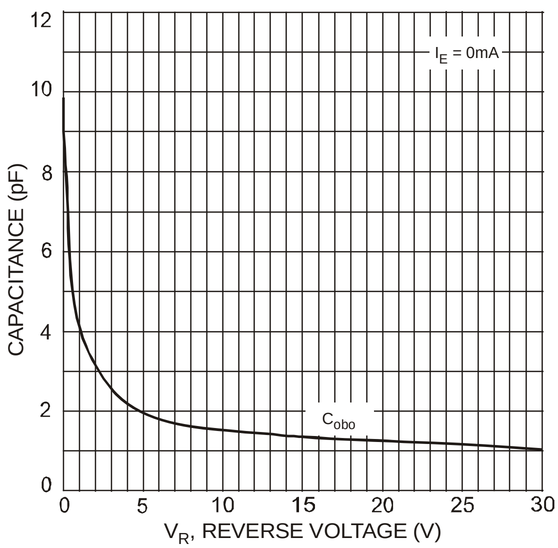


Fig. 26 Typical Capacitance Characteristics

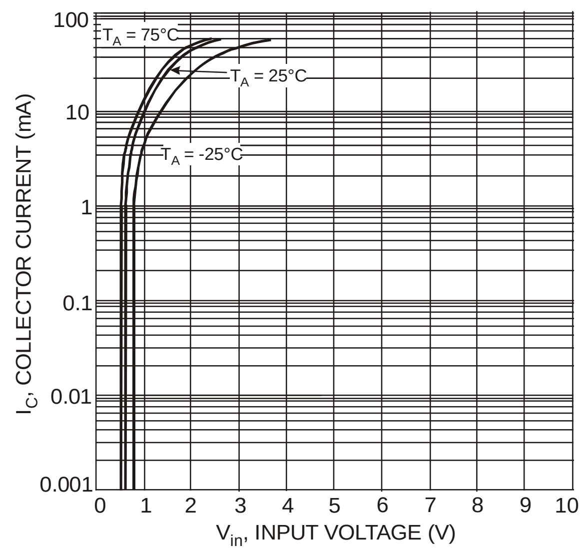


Fig. 27 Collector Current vs. Input Voltage

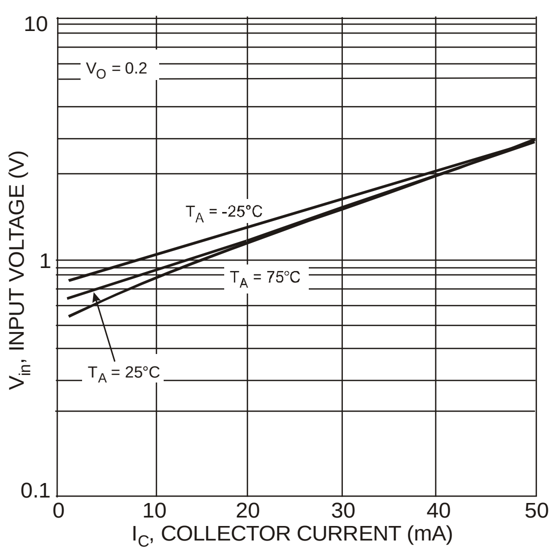


Fig. 28 Input Voltage vs. Collector Current

Typical Curves- DCX114TK NPN Section

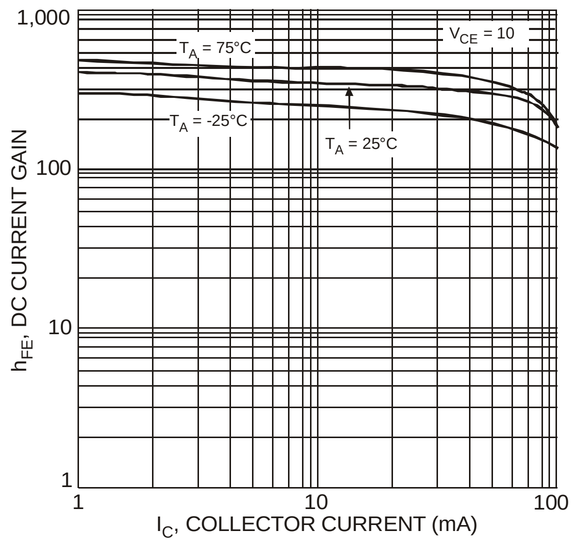


Fig. 29 Typical DC Current Gain vs. Collector Current

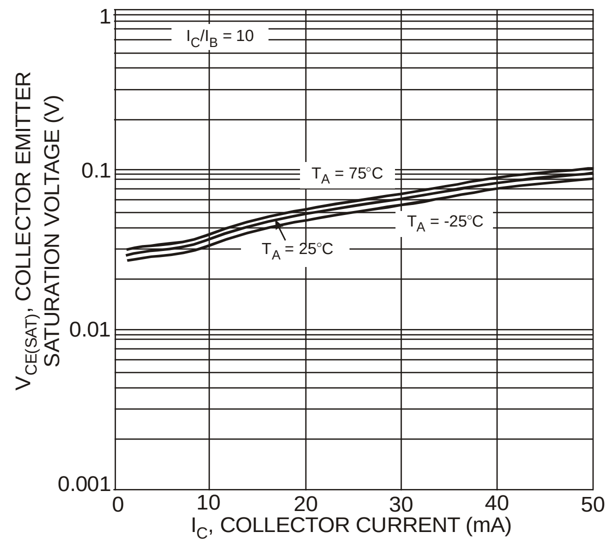


Fig. 30 Typical Collector Emitter Saturation Voltage vs. Collector Current

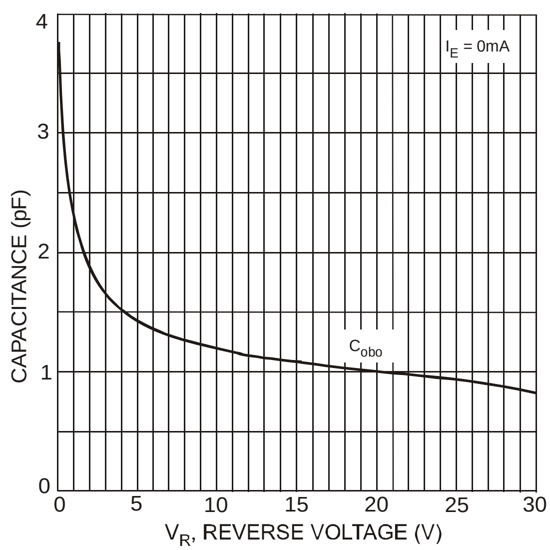


Fig. 31 Typical Capacitance Characteristics

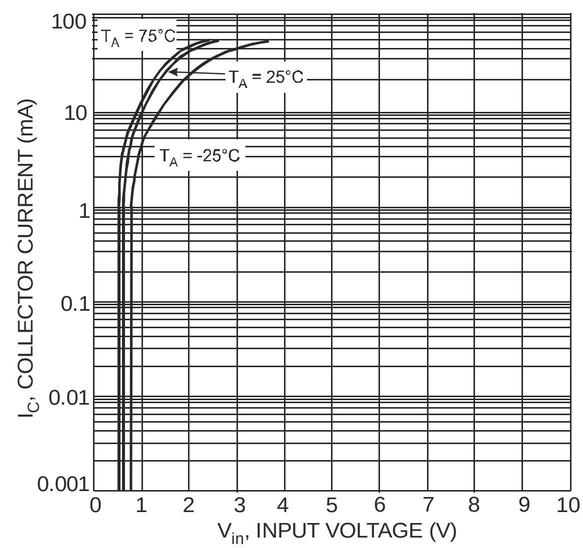


Fig. 32 Collector Current vs. Input Voltage

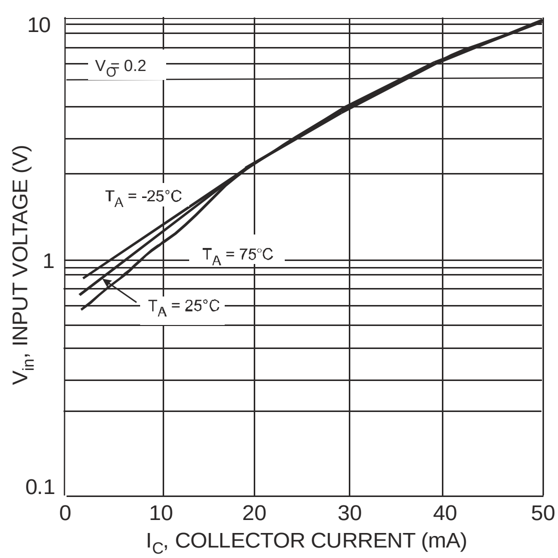


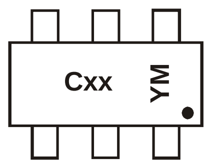
Fig. 33 Input Voltage vs. Collector Current

Ordering Information (Notes 5 & 6)

Part Number	Case	Packaging
DCX124EK-7	SC-74R	3000/Tape & Reel
DCX144EK-7	SC-74R	3000/Tape & Reel
DCX114YK-7	SC-74R	3000/Tape & Reel
DCX123JK-7	SC-74R	3000/Tape & Reel
DCX114EK-7	SC-74R	3000/Tape & Reel
DCX115EK-7	SC-74R	3000/Tape & Reel
DCX143TK-7	SC-74R	3000/Tape & Reel
DCX114TK-7	SC-74R	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.
6. For Lead Free/RoHS Compliant version part numbers, please add "-F" suffix to the part numbers above. Example: DCX114TK-7-F.

Marking Information



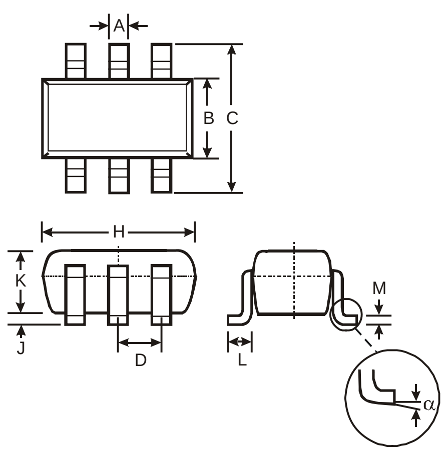
Cxx = Product Type Marking Code (See Page 1)
YM = Date Code Marking
Y = Year (ex: T = 2006)
M = Month (ex: 9 = September)

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	T	U	V	W	X	Y	Z	A	B	C

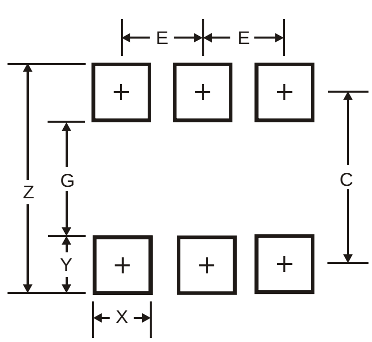
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Package Outline Dimensions



SC-74R			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C	2.40
E	0.95

OCEAN CHIPS
Океан Электроники
Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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