

COMPLEMENTARY NPN/PNP PRE-BIASED SMALL SIGNAL SOT-363 DUAL SURFACE MOUNT TRANSISTOR

NEW PRODUCT

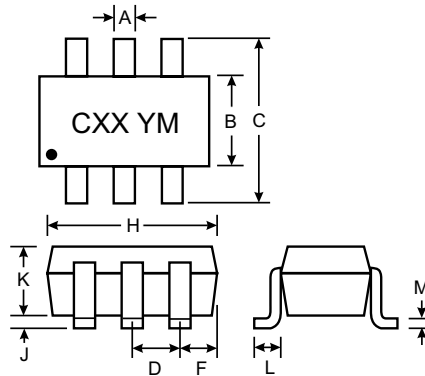
Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors

UNDER DEVELOPMENT

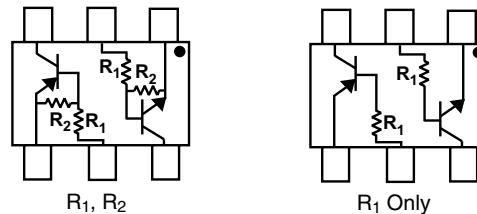
Mechanical Data

- Case: SOT-363, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approx.)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.80	2.20
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
All Dimensions in mm		

P/N	R1	R2	MARKING
DCX124EU	22K	22K	C17
DCX144EU	47K	47K	C20
DCX114YU	10K	47K	C14
DCX123JU	2.2K	47K	C06
DCX114EU	10K	10K	C13
DCX143TU	4.7K	-	C07
DCX114TU	10K	-	C12



SCHEMATIC DIAGRAM

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

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (1)	V _{CC}	50	V
Input Voltage, (2) to (1)	V _{IN}	-10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -5 V _{max} -5 V _{max}	V
Output Current	I _O	30 30 70 100 50 100 100	mA
Output Current	I _C (Max)	100	mA
Power Dissipation	P _d	200	mW
Operating and Storage and Temperature Range	T _j , T _{STG}	-55 to +150	°C

Maximum Ratings PNP Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (1)	V_{CC}	50	V
Input Voltage, (2) to (1) DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU DCX143TU DCX114TU	V_{IN}	+10 to -40 +10 to -40 +6 to -40 +5 to -12 +10 to -40 +5 V_{max} +5 V_{max}	V
Output Current DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU DCX143TU DCX114TU	I_O	-30 -30 -70 -100 -50 -100 -100	mA
Output Current All	I_C (Max)	-100	mA
Power Dissipation	P_d	200	mW
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics NPN Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic (DCX143TU & DCX114TU only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	$I_C = 50\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	50	—	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	$I_E = 50\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	—	0.5	μA	$V_{CB} = 50\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	0.5	μA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C/I_B = 2.5\text{mA} / 0.25\text{mA}$ DCX143TU $I_C/I_B = 1\text{mA} / 0.1\text{mA}$ DCX114TU
DC Current Transfer Ratio	h_{FE}	100	250	600	—	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$
Gain-Bandwidth Product*	f_T	—	250	—	MHz	$V_{CE} = 10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU	$V_{I(off)}$	0.5 0.5 0.3 0.5 0.5	1.1 1.1 — — 1.1	—	V	$V_{CC} = 5\text{V}, I_O = 100\mu\text{A}$
Input Voltage DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU	$V_{I(on)}$	—	1.9 1.9 — — 1.9	3.0 3.0 1.4 1.1 3.0	V	$V_O = 0.3, I_O = 5\text{mA}$ $V_O = 0.3, I_O = 2\text{mA}$ $V_O = 0.3, I_O = 1\text{mA}$ $V_O = 0.3, I_O = 5\text{mA}$ $V_O = 0.3, I_O = 10\text{mA}$
Output Voltage DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU	$V_{O(on)}$	—	0.1	0.3	V	$I_O/I_I = 10\text{mA} / 0.5\text{mA}$ $I_O/I_I = 10\text{mA} / 0.5\text{mA}$ $I_O/I_I = 5\text{mA} / 0.25\text{mA}$ $I_O/I_I = 5\text{mA} / 0.25\text{mA}$ $I_O/I_I = 10\text{mA} / 0.5\text{mA}$
Input Current DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU	I_I	—	—	0.36 0.18 0.88 3.6 0.88	mA	$V_I = 5\text{V}$
Output Current	$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50\text{V}, V_I = 0\text{V}$
DC Current Gain DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU	G_I	56 68 68 80 30	—	—	—	$V_O = 5\text{V}, I_O = 5\text{mA}$ $V_O = 5\text{V}, I_O = 5\text{mA}$ $V_O = 5\text{V}, I_O = 10\text{mA}$ $V_O = 5\text{V}, I_O = 10\text{mA}$ $V_O = 5\text{V}, I_O = 5\text{mA}$
Gain-Bandwidth Product*	f_T	—	250	—	MHz	$V_{CE} = 10\text{V}, I_E = 5\text{mA}, f = 100\text{MHz}$

* Transistor - For Reference Only

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Electrical Characteristics PNP Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic (DCX143TU & DCX114TU only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	$I_C = -50\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	-50	—	—	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	$I_E = -50\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	—	-0.5	μA	$V_{CB} = -50\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	-0.5	μA	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-0.3	V	$I_C/I_B = 2.5\text{mA} / 0.25\text{mA}$ DCX143TU $I_C/I_B = 1\text{mA} / 0.1\text{mA}$ DCX114TU
DC Current Transfer Ratio	h_{FE}	100	250	600	—	$I_C = -1\text{mA}$, $V_{CE} = -5\text{V}$
Gain-Bandwidth Product*	f_T	—	250	—	MHz	$V_{CE} = -10\text{V}$, $I_E = 5\text{mA}$, $f = 100\text{MHz}$

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Input Voltage	$V_{I(off)}$	DCX124EU	-0.5	-1.1	—	V	$V_{CC} = -5\text{V}$, $I_O = -100\mu\text{A}$
		DCX144EU	-0.5	-1.1			
	$V_{I(on)}$	DCX114YU	-0.3	—	—	V	$V_O = -0.3$, $I_O = -5\text{mA}$ $V_O = -0.3$, $I_O = -2\text{mA}$ $V_O = -0.3$, $I_O = -1\text{mA}$ $V_O = -0.3$, $I_O = -5\text{mA}$ $V_O = -0.3$, $I_O = -10\text{mA}$
		DCX123JU	-0.5	—			
		DCX114EU	-0.5	-1.1			
Output Voltage	$V_{O(on)}$	DCX124EU	—	-1.9	-3.0	V	$I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -5\text{mA} / -0.25\text{mA}$ $I_O/I_I = -5\text{mA} / -0.25\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$
		DCX144EU	—	-1.9	-3.0		
		DCX114YU	—	—	-1.4		
		DCX123JU	—	—	-1.1		
		DCX114EU	—	-1.9	-3.0		
Input Current	I_I	—	—	-0.36	mA	$V_I = -5\text{V}$	
		DCX144EU	—	-0.18			
		DCX114YU	—	-0.88			
		DCX123JU	—	-3.6			
		DCX114EU	—	-0.88			
Output Current	$I_{O(off)}$	—	—	-0.5	μA	$V_{CC} = 50\text{V}$, $V_I = 0\text{V}$	
DC Current Gain	G_I	DCX124EU	56	—	—	—	$V_O = -5\text{V}$, $I_O = -5\text{mA}$ $V_O = -5\text{V}$, $I_O = -5\text{mA}$ $V_O = -5\text{V}$, $I_O = -10\text{mA}$ $V_O = -5\text{V}$, $I_O = -10\text{mA}$ $V_O = -5\text{V}$, $I_O = -5\text{mA}$
		DCX144EU	68	—	—		
		DCX114YU	68	—	—		
		DCX123JU	80	—	—		
		DCX114EU	30	—	—		
Gain-Bandwidth Product*	f_T	—	250	—	MHz	$V_{CE} = -10\text{V}$, $I_E = -5\text{mA}$, $f = 100\text{MHz}$	

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