

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

NEW PRODUCT

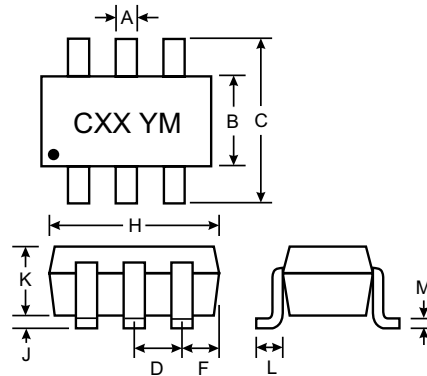
### Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors

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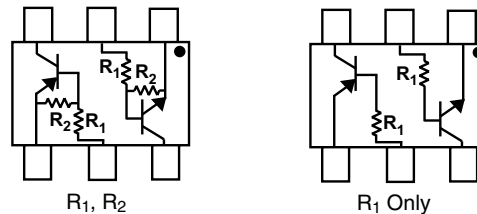
### Mechanical Data

- 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<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (1)	V <sub>CC</sub>	50	V
Input Voltage, (2) to (1)	V <sub>IN</sub>	-10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -5 V <sub>max</sub> -5 V <sub>max</sub>	V
Output Current	I <sub>O</sub>	30 30 70 100 50 100 100	mA
Output Current	I <sub>C</sub> (Max)	100	mA
Power Dissipation	P <sub>d</sub>	200	mW
Operating and Storage and Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-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	$\mu\text{A}$	$V_{CB} = 50\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	0.5	$\mu\text{A}$	$V_{EB} = 4\text{V}$
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	$\mu\text{A}$	$V_{CC} = 50\text{V}, V_I = 0\text{V}$
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	$\mu\text{A}$	$V_{CB} = -50\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-0.5	$\mu\text{A}$	$V_{EB} = -4\text{V}$
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	$V_{CC} = -5\text{V}, I_O = -100\mu\text{A}$
	DCX124EU DCX144EU DCX114YU DCX123JU DCX114EU	$V_{I(on)}$	—	-1.9 -1.9 — — -1.9	-3.0 -3.0 -1.4 -1.1 -3.0		
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	$\mu\text{A}$	$V_{CC} = 50\text{V}, V_I = 0\text{V}$
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	$V_{CE} = -10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

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