

**Maximum Ratings NPN Section** (@T<sub>A</sub> = +25°C unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage		V <sub>CC</sub>	50	V
Input Voltage	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH DCX143TH DCX114TH	V <sub>IN</sub>	-10 to +40 -10 to +40 -10 to +30 -6 to +40 -5 to +12 -10 to +40 -5V max -5V max	V
Output Current	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH DCX143TH DCX114TH	I <sub>O</sub>	30 30 100 70 100 50 100 100	mA
Output Current	All	I <sub>C</sub> (Max)	100	mA
Power Dissipation	(Total)	P <sub>d</sub>	150	mW
Thermal Resistance, Junction to Ambient Air	(Note 5)	R <sub>θJA</sub>	833	°C/W
Operating and Storage Temperature Range		T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

Note: 5. Mounted on FR4 Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.

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Input Voltage	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH DCX143TH DCX114TH	V <sub>IN</sub>	+10 to -40 +10 to -40 +10 to -30 +6 to -40 +5 to -12 +10 to -40 +5V max +5V max	V
Output Current	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH DCX143TH DCX114TH	I <sub>O</sub>	-30 -30 -100 -70 -100 -50 -100 -100	mA
Output Current	All	I <sub>C</sub> (Max)	-100	mA
Power Dissipation (Total)		P <sub>d</sub>	150	mW
Operating and Storage Temperature Range		T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

# Electrical Characteristics NPN Section (@T<sub>A</sub> = +25°C unless otherwise specified.)

Characteristic (DDC143TH & DDC114TH only)		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV <sub>CBO</sub>	50	—	—	V	I <sub>C</sub> = 50μA
Collector-Emitter Breakdown Voltage		BV <sub>CEO</sub>	50	—	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage		BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> = 50μA
Collector Cut-Off Current		I <sub>CBO</sub>	—	—	0.5	μA	V <sub>CB</sub> = 50V
Emitter Cut-Off Current		I <sub>EBO</sub>	—	—	0.5	μA	V <sub>EB</sub> = 4V
Collector-Emitter Saturation Voltage		V <sub>CE(sat)</sub>	—	—	0.3	V	I <sub>C</sub> /I <sub>B</sub> = 2.5mA / 0.25mA DCX143TH I <sub>C</sub> /I <sub>B</sub> = 1mA / 0.1mA DCX114TH
DC Current Transfer Ratio		h <sub>FE</sub>	100	250	600	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V
Gain-Bandwidth Product*		f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX124EH	V <sub>I(off)</sub>	0.5	1.1	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
	DCX144EH		0.5	1.1			
	DCX143EH		0.5	1.1			
	DCX114YH		0.3	—			
	DCX123JH		0.5	—			
	DCX114EH		0.5	1.1			
	DCX124EH	V <sub>I(on)</sub>	—	1.9	3.0	—	V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA
	DCX144EH			1.9	3.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA
	DCX143EH			1.9	3.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA
	DCX114YH			—	1.4		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA
	DCX123JH			—	1.1		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA
	DCX114EH			1.9	3.0		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA
Output Voltage	DCX124EH	V <sub>O(on)</sub>	—	0.1	0.3	V	I <sub>O</sub> /I <sub>I</sub> = 10mA / 0.5mA
	DCX144EH						I <sub>O</sub> /I <sub>I</sub> = 10mA / 0.5mA
	DCX143EH						I <sub>O</sub> /I <sub>I</sub> = 10mA / 0.5mA
	DCX114YH						I <sub>O</sub> /I <sub>I</sub> = 5mA / 0.25mA
	DCX123JH						I <sub>O</sub> /I <sub>I</sub> = 5mA / 0.25mA
	DCX114EH						I <sub>O</sub> /I <sub>I</sub> = 10mA / 0.5mA
Input Current	DCX124EH	I <sub>I</sub>	—	—	0.36	mA	V <sub>I</sub> = 5V
	DCX144EH				0.18		
	DCX143EH				1.8		
	DCX114YH				0.88		
	DCX123JH				3.6		
	DCX114EH				0.88		
Output Current		I <sub>O(off)</sub>	—	—	0.5	μA	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V
DC Current Gain	DCX124EH	G <sub>I</sub>	56	—	—	—	V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
	DCX144EH		68				V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
	DCX143EH		20				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
	DCX114YH		68				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
	DCX123JH		80				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
	DCX114EH		30				V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA
	DCX114EH		30				V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA

\* Transistor - For Reference Only

**Electrical Characteristics PNP Section** (@T<sub>A</sub> = +25°C unless otherwise specified.)

Characteristic (DCX143TH & DCX114TH only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-50	—	—	V	I <sub>C</sub> = -50μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-50	—	—	V	I <sub>C</sub> = -1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	—	—	V	I <sub>E</sub> = -50μA
Collector Cut-Off Current	I <sub>CBO</sub>	—	—	-0.5	μA	V <sub>CB</sub> = -50V
Emitter Cut-Off Current	I <sub>EBO</sub>	—	—	-0.5	μA	V <sub>EB</sub> = -4V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	-0.3	V	I <sub>C</sub> /I <sub>B</sub> = 2.5mA / 0.25mA DCX143TH I <sub>C</sub> /I <sub>B</sub> = 1mA / 0.1mA DCX114TH
DC Current Transfer Ratio	h <sub>FE</sub>	100	250	600	—	I <sub>C</sub> = -1mA, V <sub>CE</sub> = -5V
Gain-Bandwidth Product*	f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH	-0.5 -0.5 -0.5 -0.3 -0.5 -0.5	-1.1 -1.1 -1.1 — — -1.1	—	V	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA
	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH	—	-1.9 -1.9 -1.9 — — -1.9	-3.0 -3.0 -3.0 -1.4 -1.1 -3.0		V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -2mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -1mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA V <sub>O</sub> = -0.3V, I <sub>O</sub> = -10mA
Output Voltage	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH	—	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA
Input Current	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH	—	—	-0.36 -0.18 -1.8 -0.88 -3.6 -0.88	mA	V <sub>I</sub> = -5V
Output Current	I <sub>O(off)</sub>	—	—	-0.5	μA	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V
DC Current Gain	DCX124EH DCX144EH DCX143EH DCX114YH DCX123JH DCX114EH	56 68 20 68 80 30	—	—	—	V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA
Gain-Bandwidth Product*	f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = -5mA, f = 100MHz

\* Transistor - For Reference Only

Typical Curves – DCX143EH NPN Section

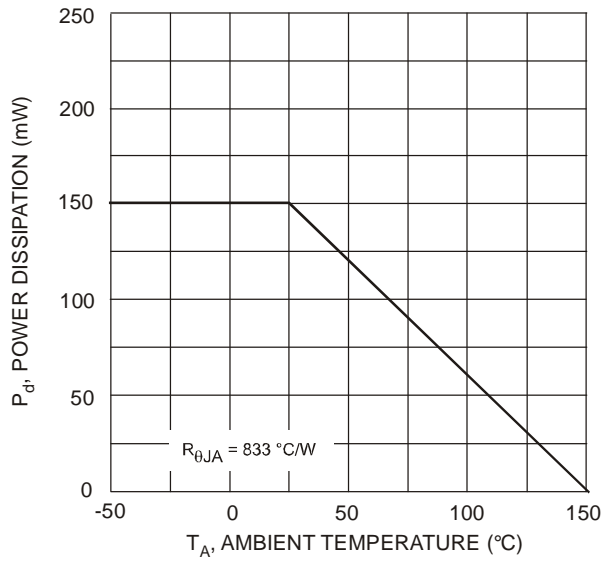


Fig. 1 Derating Curve - Total

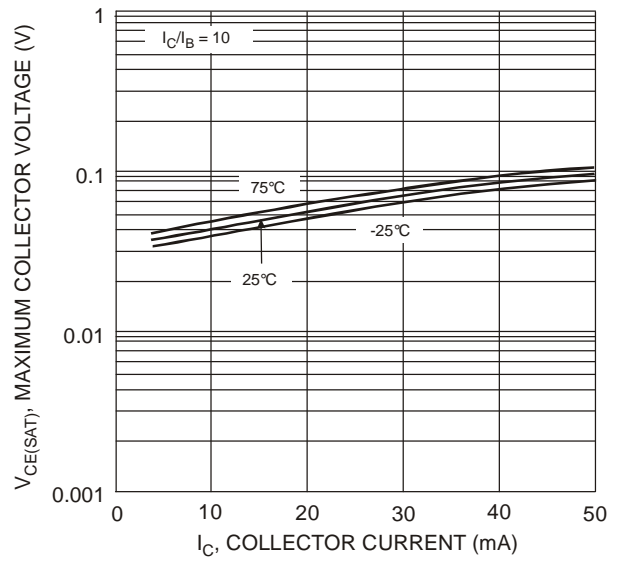


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

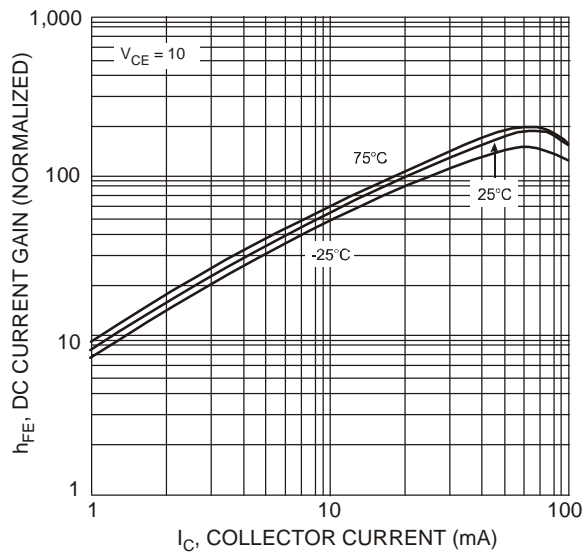


Fig. 3 DC Current Gain

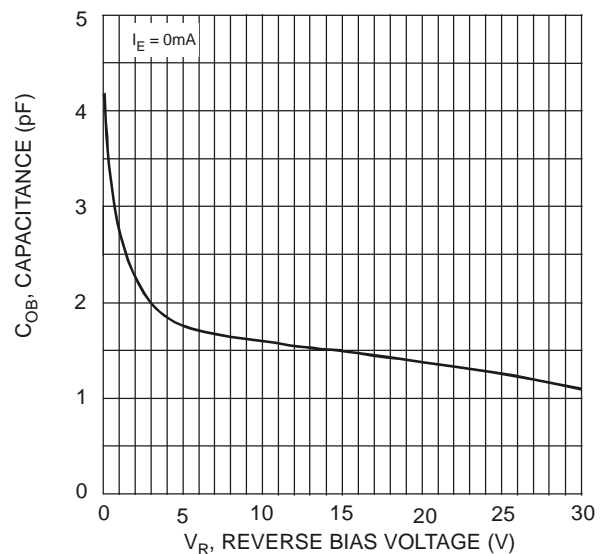


Fig. 4 Output Capacitance

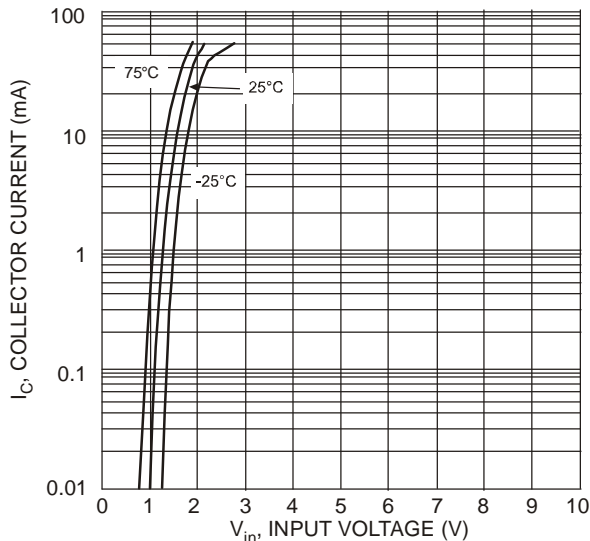


Fig. 5 Collector Current vs. Input Voltage

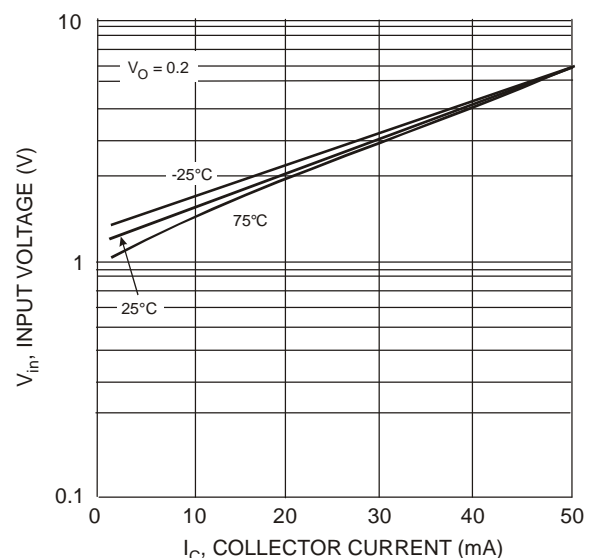


Fig. 6 Input Voltage vs. Collector Current

# Typical Curves – DCX143EH PNP Section

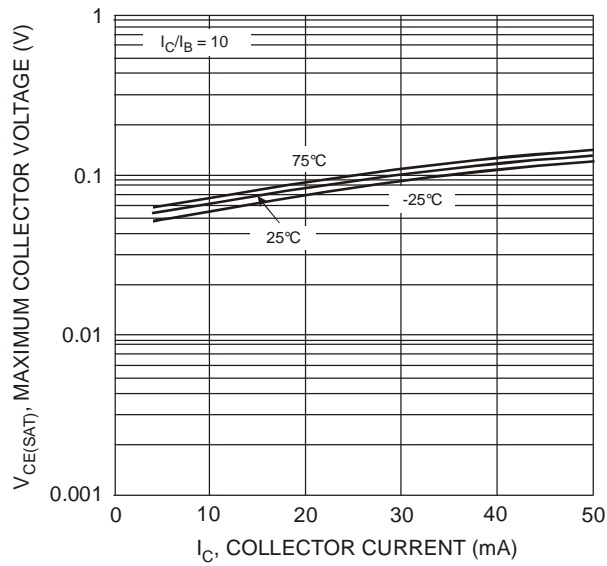


Fig. 7  $V_{CE(SAT)}$  vs.  $I_C$

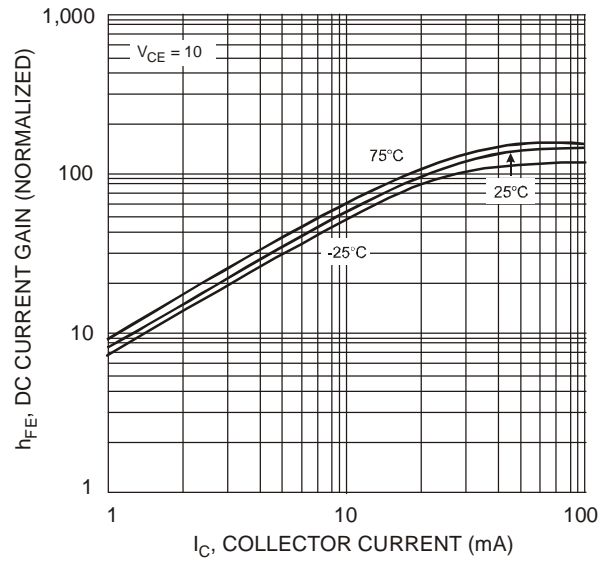


Fig. 8 DC Current Gain

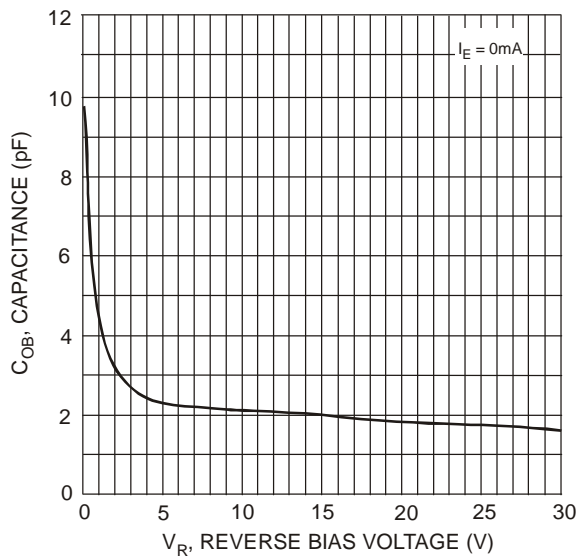


Fig. 9 Output Capacitance

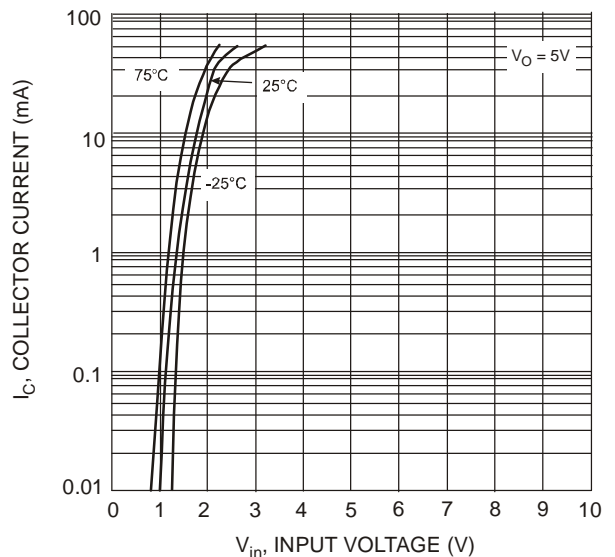


Fig. 10 Collector Current vs. Input Voltage

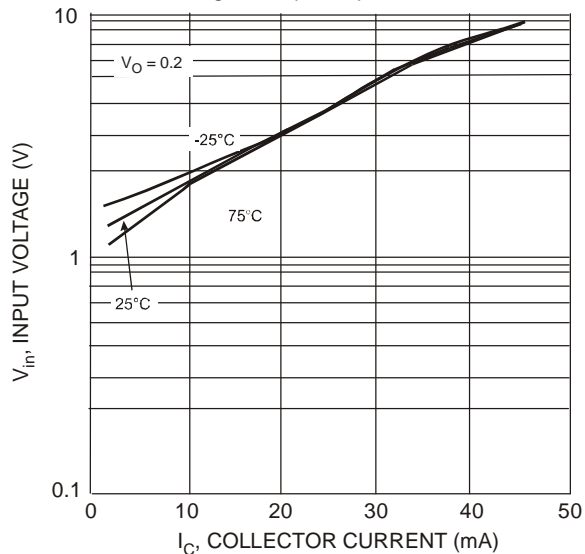
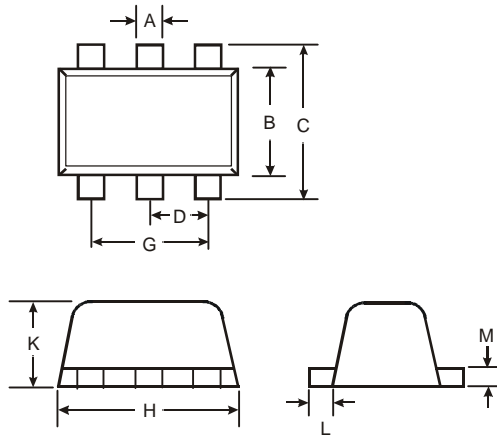


Fig. 11 Input Voltage vs. Collector Current

## Package Outline Dimensions

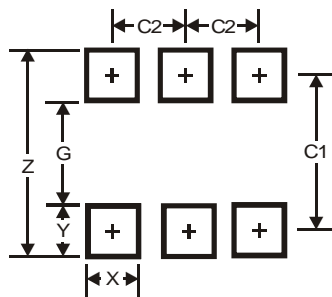
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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