

Features

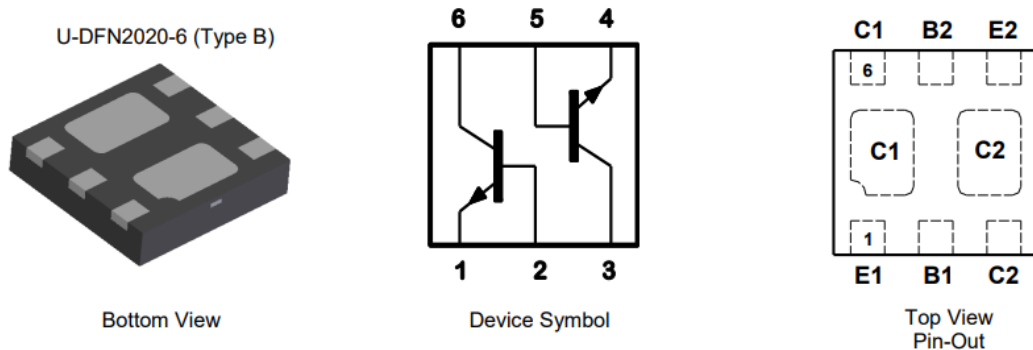
- $BV_{CEO} > 120V$
- Continuous Current up to 1A
- 1% Matched Tolerance: $V_{BE(sat)}$ & $V_{BE(on)}$
- 2% Matched Tolerance: h_{FE}
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Package: U-DFN2020-6
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - NiPdAu, Solderable per MIL-STD-202, Method 208 **(e4)**
- Weight: 0.007 grams (Approximate)

Applications

- Oring gate drivers
- Voltage monitoring circuits
- Power switches
- Load switches
- Motor controls



Ordering Information (Note 4)

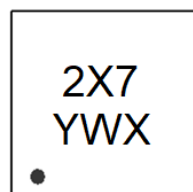
Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DXTN81120DFDB-7	U-DFN2020-6 (Type B)	2X7	7	8	3000	Reel

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

U-DFN2020-6 (Type B)



2X7 = Product Type Marking Code
Y = Year: 0 to 9
W = Week: A to Z: 1 to 26 Week;
a to z: 27 to 52 Week;
z Represents 52 and 53 Week
X = A to Z: Internal Code

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	120	V
Collector-Emitter Voltage	V _{CEO}	120	V
Emitter-Base Voltage	V _{EBO}	8	V
Continuous Collector Current	I _C	1	A
Peak Collector Current	I _{CM}	1.5	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	0.42	W
		0.53	
		0.66	
		0.88	
		0.85	
		1.2	
Thermal Resistance, Junction to Ambient	R _{θJA}	295	°C/W
		235	
		190	
		142	
		147	
		104	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 11)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the exposed collector pad mounted on MRP 1oz copper single sided FR4 PCB, device is measured under still air conditions whilst operating in the steady state. Tested with one active die running.
 6. Same as Note 5 but with two active die running.
 7. For a device with each exposed collector pad mounted on 5mm × 5mm 1oz copper single sided FR4 PCB, device is measured under still air conditions whilst operating in the steady state. Tested with one active die running.
 8. Same as Note 7 but with two active die running.
 9. For a device with each exposed collector pad mounted on 10mm × 10mm 1oz copper single sided FR4 PCB, device is measured under still air conditions whilst operating in the steady state. Tested with one active die running.
 10. Same as Note 9 but with two active die running.
 11. Refer to JEDEC specifications JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

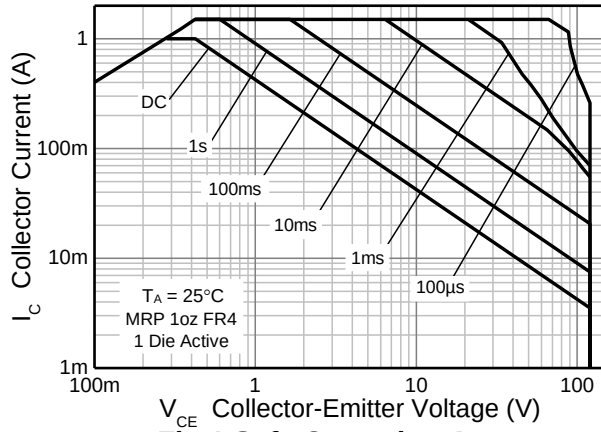


Fig.1 Safe Operating Area

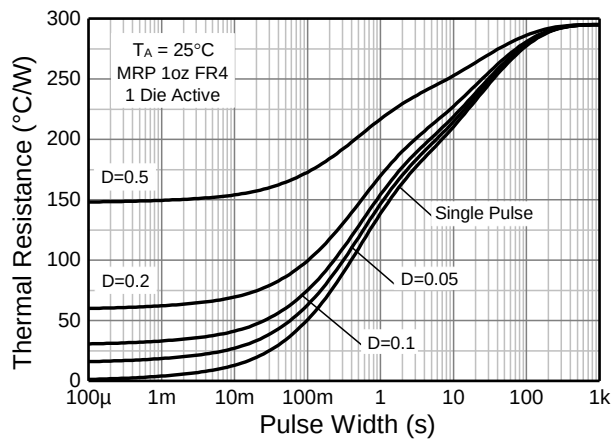


Fig.2 Transient Thermal Impedance

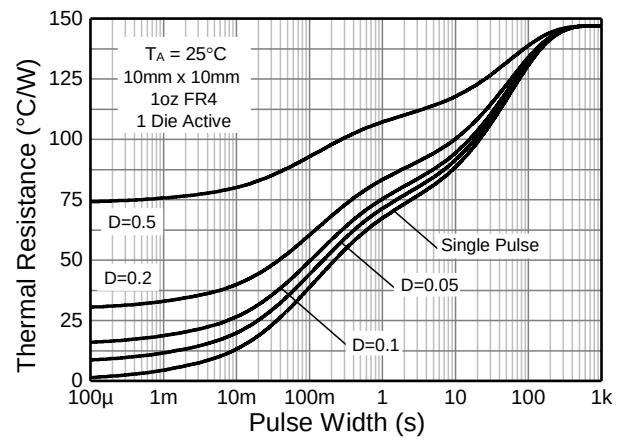


Fig.3 Transient Thermal Impedance

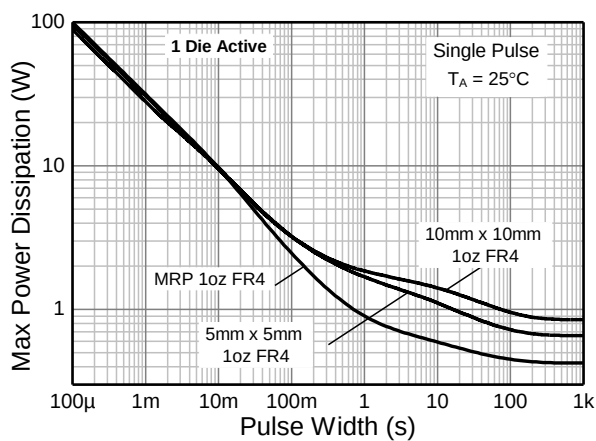


Fig.4 Pulse Power Dissipation

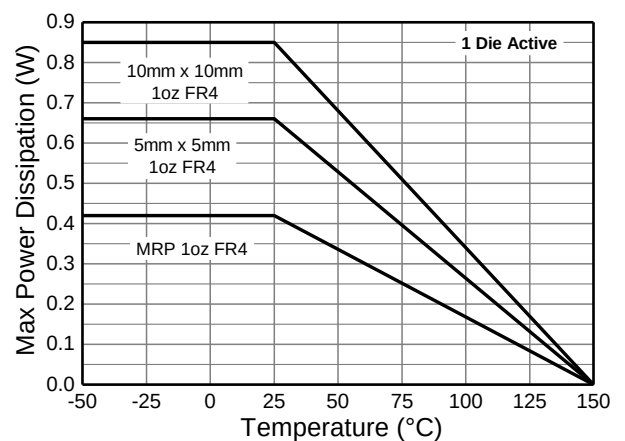


Fig.5 Derating Curve

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 12)						
Collector-Base Breakdown Voltage	BV _{CBO}	150	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage	BV _{CEO}	120	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EB0}	8	—	—	V	I _E = 100μA
Collector-Base Cutoff Current	I _{CBO}	—	3 0.03	100 10	nA μA	V _{CB} = 120V, I _E = 0 V _{CB} = 120V, I _E = 0, T _J = +150°C
Emitter Cutoff Current	I _{EB0}	—	3	50	nA	V _{EB} = 7V
Collector Emitter Cutoff Current	I _{CES}	—	-5	-100	nA	V _{CES} = -96V
ON CHARACTERISTICS (Note 12)						
DC Current Gain	h _{FE}	240 80 30	290 165 65	420 — —	—	I _C = 100mA, V _{CE} = 2V I _C = 500mA, V _{CE} = 2V I _C = 1A, V _{CE} = 2V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	55 130 95	100 240 180	mV	I _C = 500mA, I _B = 50mA I _C = 1A, I _B = 50mA I _C = 1A, I _B = 100mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	—	0.82 0.84 0.86	0.9 0.95 1	V	I _C = 500mA, I _B = 50mA I _C = 1A, I _B = 50mA I _C = 1A, I _B = 100mA
Base-Emitter Turn-On Voltage	V _{BE(on)}	—	0.75	0.85	V	I _C = 500mA, V _{CE} = 2V
MATCHING CHARACTERISTICS						
DC Current Gain Matching	h _{FE1} /h _{FE2}	-2%	—	+2%	—	I _C = 100mA, V _{CE} = 2V
Base-Emitter Turn-On Voltage Matching	V _{BE(on)1} / V _{BE(on)2}	-1%	—	+1%	—	I _C = 500mA, V _{CE} = 2V
Collector-Emitter Saturation Voltage Matching	V _{CE(sat)1} / V _{CE(sat)2}	-4%	—	+4%	—	I _C = 1A, I _B = 50mA
Base-Emitter Saturation Voltage Matching	V _{BE(sat)1} / V _{BE(sat)2}	-1%	—	+1%	—	I _C = 500mA, I _B = 50mA
SMALL-SIGNAL CHARACTERISTICS						
Input Capacitance	C _{ibo}	—	190	—	pF	V _{EB} = 0.5V, f = 1MHz
Output Capacitance	C _{obo}	—	11	—	pF	V _{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f _T	100	—	—	MHz	V _{CE} = 10V, I _C = 10mA, f = 100MHz
Delay Time	t _d	—	18	—	ns	V _{CC} = -9V, I _C = -2A, I _{B1} = -I _{B2} = -0.1A
Rise Time	t _r	—	345	—		
Storage Time	t _s	—	188	—		
Fall Time	t _f	—	166	—		

Note: 12. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

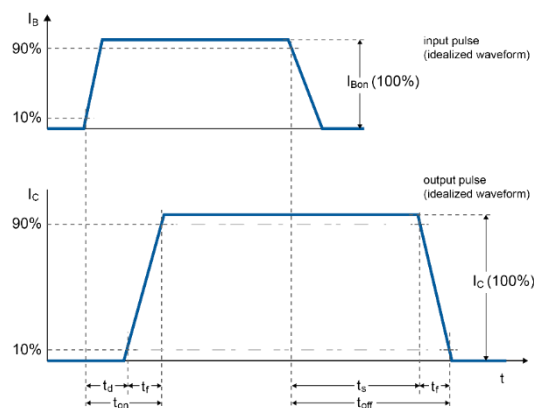
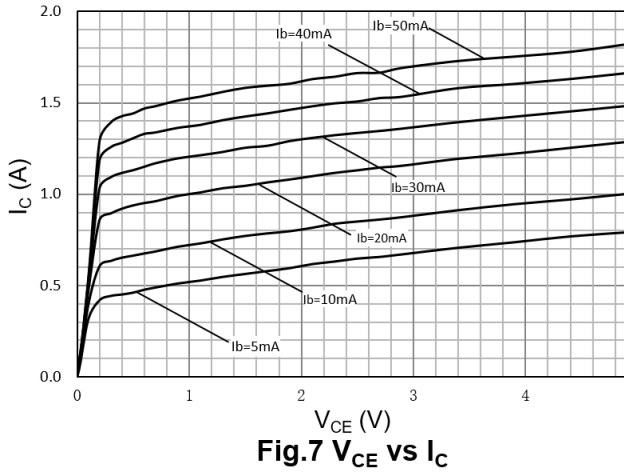
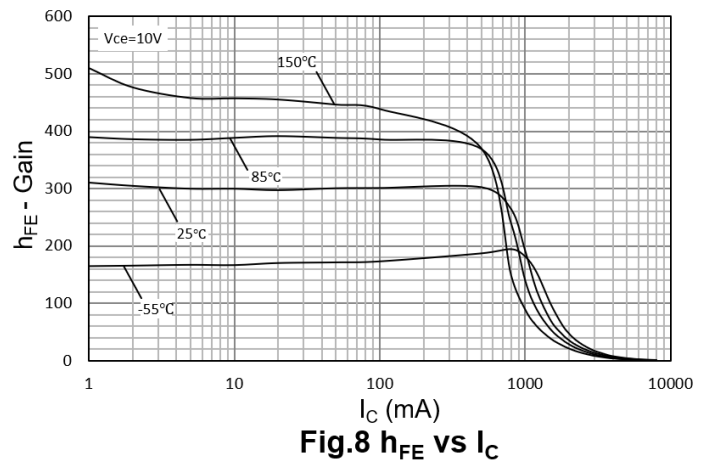
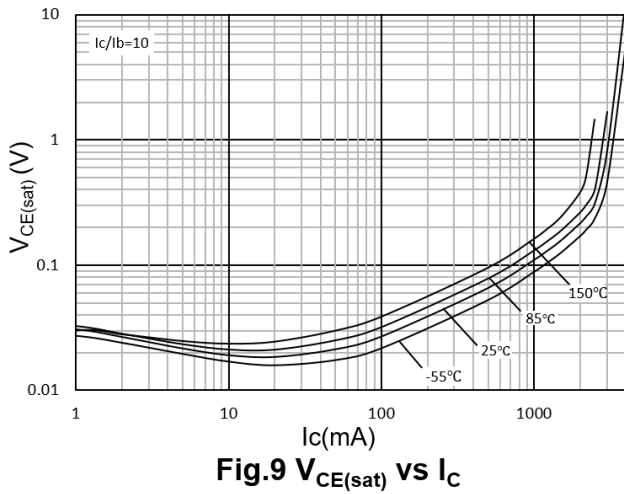
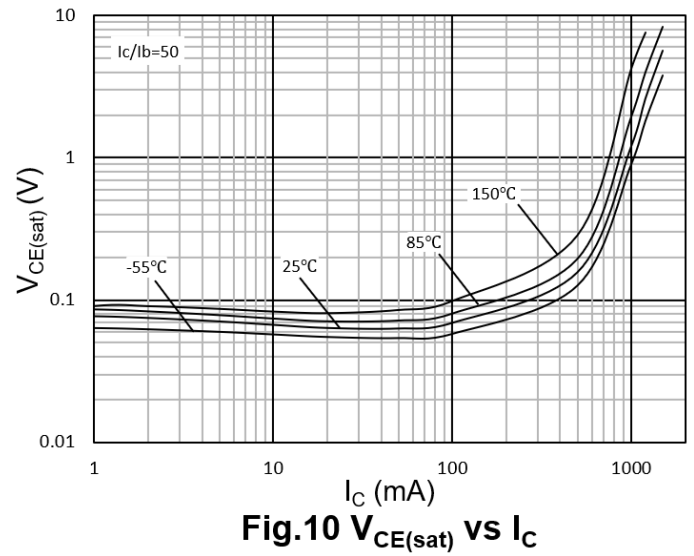
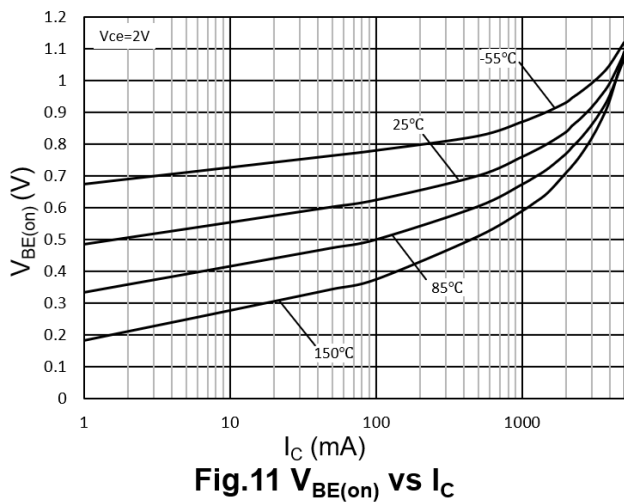
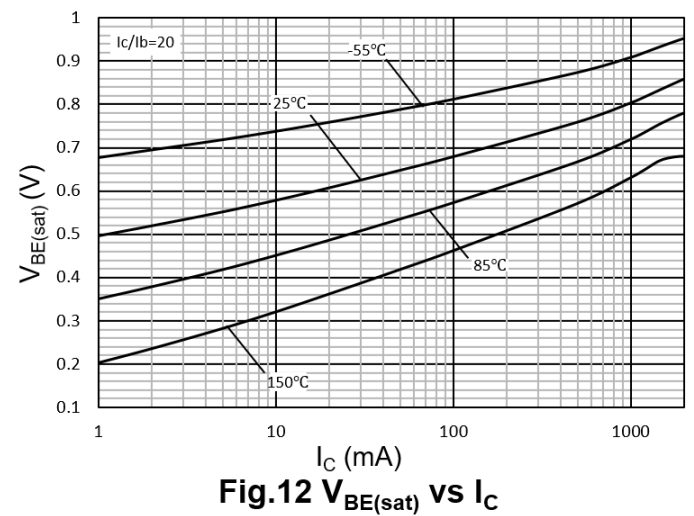
Timing Waveform


Fig.6 Timing Waveform

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.) (continued)

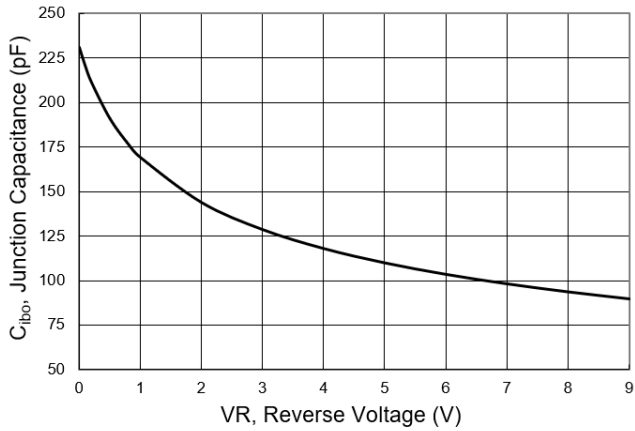


Fig.13 Typical Input Junction Capacitance

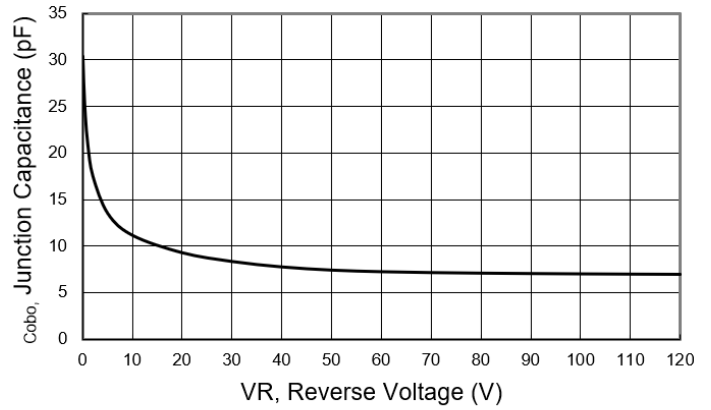
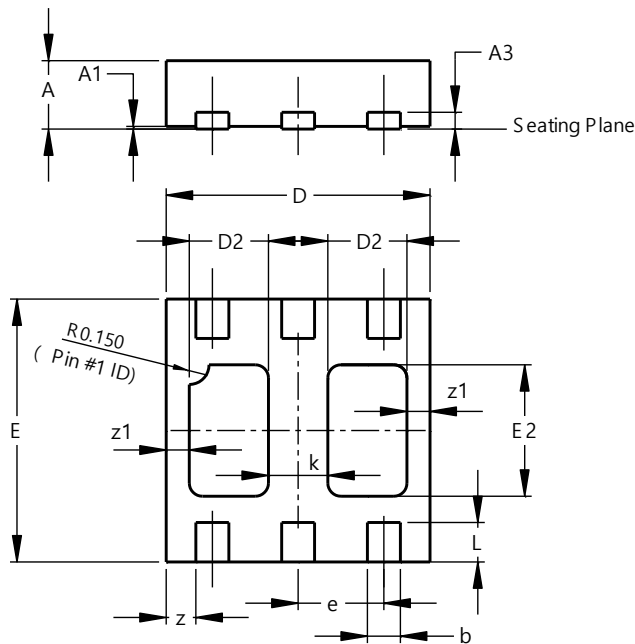


Fig.14 Typical Output Junction Capacitance

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

U-DFN2020-6 (Type B)

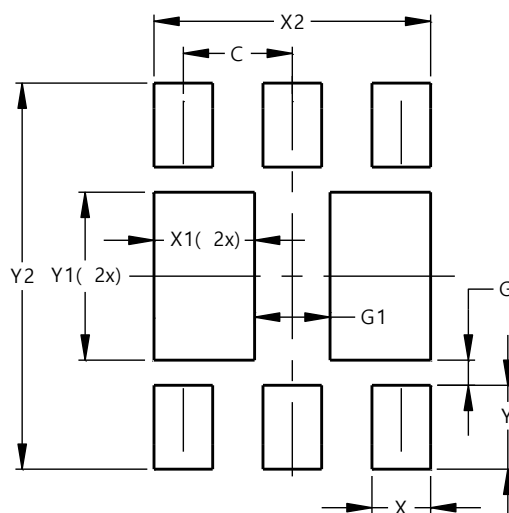


U-DFN2020-6 (Type B)			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.02
A3	-	-	0.13
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	0.50	0.70	0.60
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.90	1.10	1.00
k	-	-	0.45
L	0.25	0.35	0.30
z	-	-	0.225
z1	-	-	0.175
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

U-DFN2020-6 (Type B)



Dimensions	Value (in mm)
C	0.650
G	0.150
G1	0.450
X	0.350
X1	0.600
X2	1.650
Y	0.500
Y1	1.000
Y2	2.300

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