A Product Line of
Diodes Incorporated

Lead-free Green

ZXTN26020DMF

HIGH GAIN, LOW $V_{CE(SAT)}$ NPN BIPOLAR TRANSISTOR

Features

- High Gain Low Vcesat NPN transistor
- Very Low Rcesat
- High ICM capability
- 1.5A Continuous Current Rating
- Ultra-Small Surface mount Package
- **Qualified to AEC-Q101 Standards for High Reliability**
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**

Mechanical Data

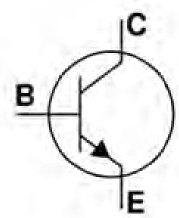
- Case: DFN1411-3
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.003 grams (approximate)

Applications

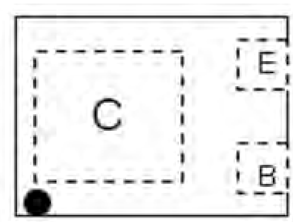
- MOSFET and IGBT gate driving
- DC-DC conversion
- Interface between low voltage IC and Load
- LED driving

Top view

Bottom view



Device Symbol



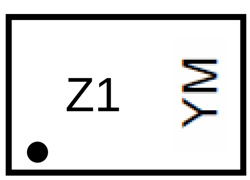
Pin-out Top view

Ordering Information

Product	Status	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN26020DMFTA	Active	Z1	7	8	3000

Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Diodes Inc’s “Green” Policy can be found on our website at http://www.diodes.com

Marking Information



Z1 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: W = 2009)
M = Month (ex: 9 = September)

Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015
Code	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

Maximum Ratings

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current (Note 4)	I_C	1.5	A
Peak Pulse Current	I_{CM}	4	A
Base Current	I_B	0.5	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P_D	1	W
Power Dissipation (Note 4)	P_D	380	mW
Thermal Resistance, Junction to Ambient (Note 3) @ T_A = 25°C	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Ambient (Note 3) @ T_A = 25°C	$R_{\theta JA}$	330	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 3. Device mounted on FR-4 PCB with 1inch square pads.
4. Device mounted on FR-4 PCB with minimum recommended pad layout

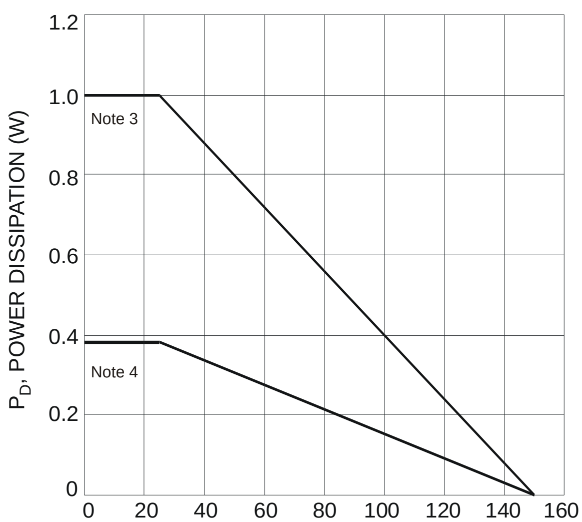


Fig. 1 Power Dissipation vs. Ambient Temperature

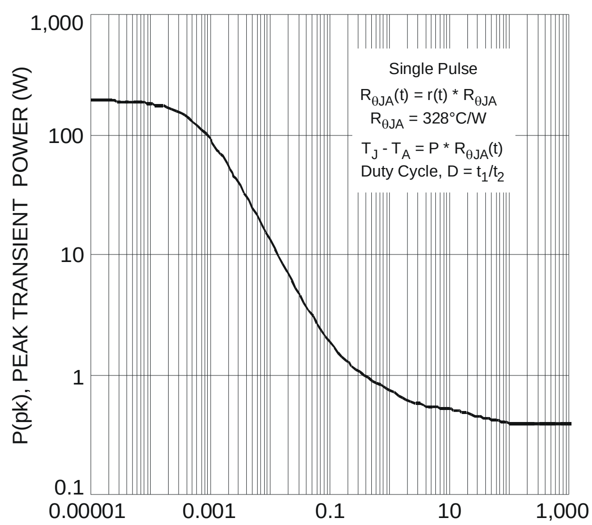


Fig. 2 Single Pulse Maximum Power Dissipation

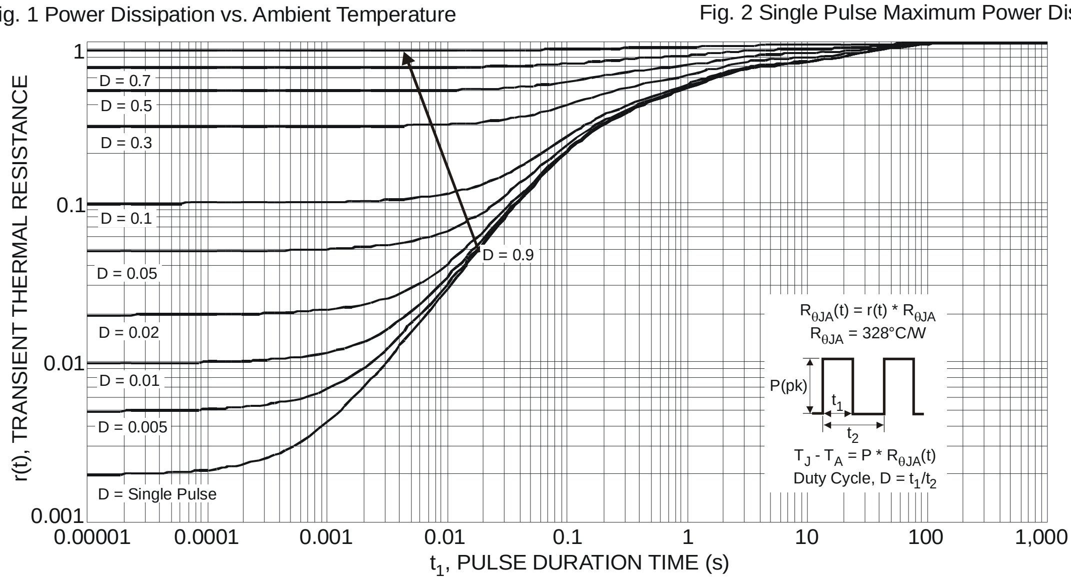


Fig. 3 Transient Thermal Response

Electrical Characteristics (at T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	20	—	—	V	I_C = 100μA, I_E = 0A
Collector-Emitter Breakdown Voltage (Note 5)	$V_{(BR)CEO}$	20	—	—	V	I_C = 10mA, I_B = 0A
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7	—	—	V	I_E = 100μA, I_C = 0A
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5	—	—	V	I_E = 100μA, I_B = 0A
Collector Cutoff Current	Icbo	—	—	100 0.5	nA μA	V_{CB} = 20V, I_E = 0A V_{CB} = 20V, I_E = 0, T_A = 125°C
Emitter Cutoff Current	Ices	—	—	100	nA	V_{CE} = 20V, V_{BE} = 0V
Base Cutoff Current	Iebo	—	—	100	nA	V_{BE} = 5.6V, I_C = 0A
DC Current Gain (Note 5)	h_{FE}	300 290 270 200	— — — —	1000 — — —	—	V_{CE} = 2V, I_C = 100mA V_{CE} = 2V, I_C = 0.5A V_{CE} = 2V, I_C = 1A V_{CE} = 2V, I_C = 2A
Collector-Emitter Saturation Voltage (Note 5)	$V_{CE(SAT)}$	— — — — — —	— — — — — —	45 70 125 225 225 290	mV mV mV mV mV mV	I_C = 100mA, I_B = 1mA I_C = 500mA, I_B = 25mA I_C = 1A, I_B = 50mA I_C = 1.5A, I_B = 30mA I_C = 2A, I_B = 100mA I_C = 2A, I_B = 40mA
Equivalent On-Resistance	$R_{CE(SAT)}$	—	90	—	mΩ	I_C = 1A, I_B = 50mA
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	1.2	V	V_{CE} = 2V, I_C = 2A
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1.1	V	I_C = 2A, I_B = 100mA
Output Capacitance (Note 5)	C_{obo}	—	—	20	pF	V_{CB} = 10V, f = 1.0MHz
Input Capacitance (Note 5)	C_{ibo}	—	—	150	pF	V_{EB} = 0.5V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	—	260	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
Turn-On Time	t_{on}	—	60	—	ns	V_{CC} = 10V, I_C = 1A I_{B2} = -I_{B1} = 50mA
Delay Time	t_d	—	20	—	ns	
Rise Time	t_r	—	40	—	ns	
Turn-Off Time	t_{off}	—	225	—	ns	
Storage Time	t_s	—	205	—	ns	
Fall Time	t_f	—	20	—	ns	

Notes: 5. Short duration pulse test used to minimize self-heating effect.

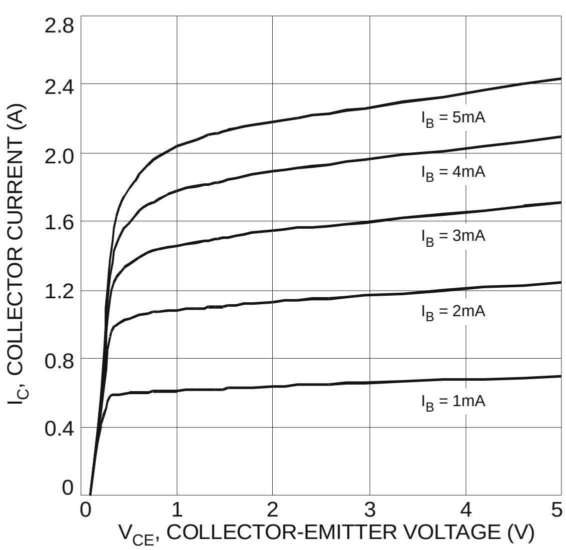


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

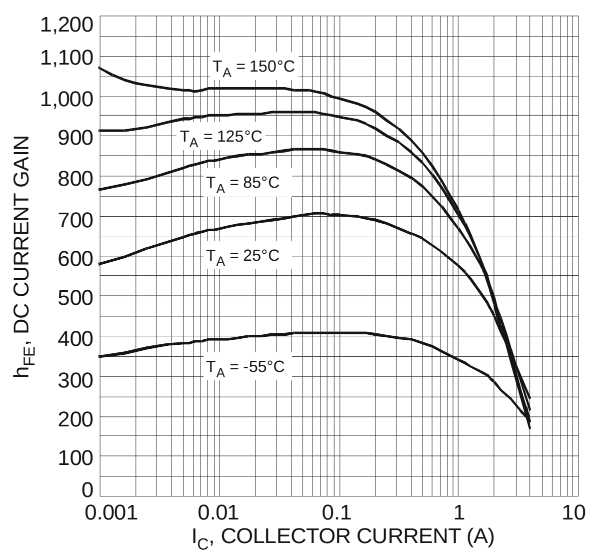


Fig. 5 Typical DC Current Gain vs. Collector Current

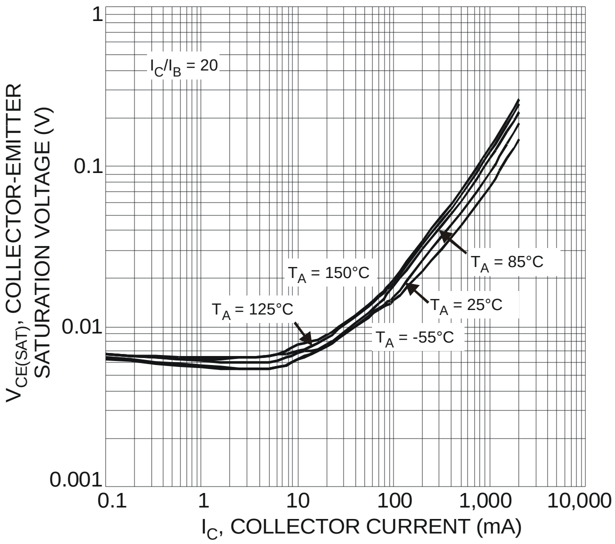


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

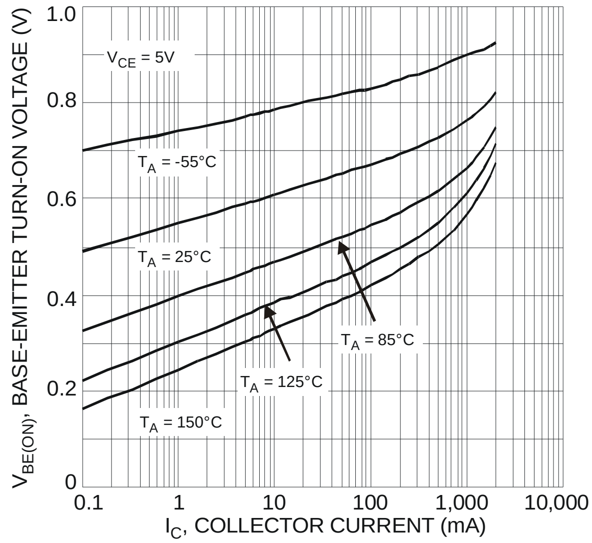


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

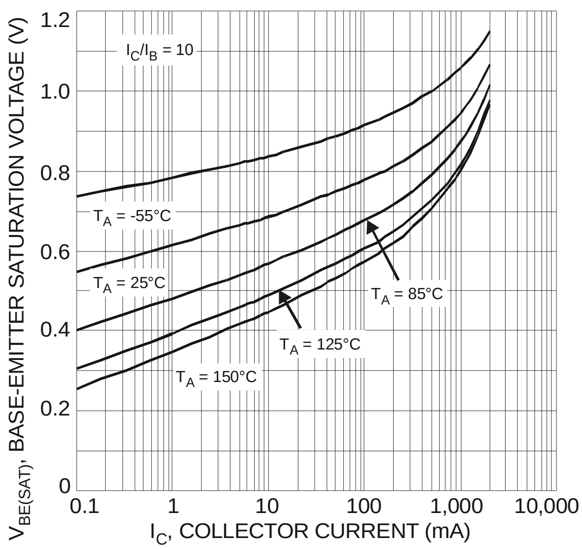


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

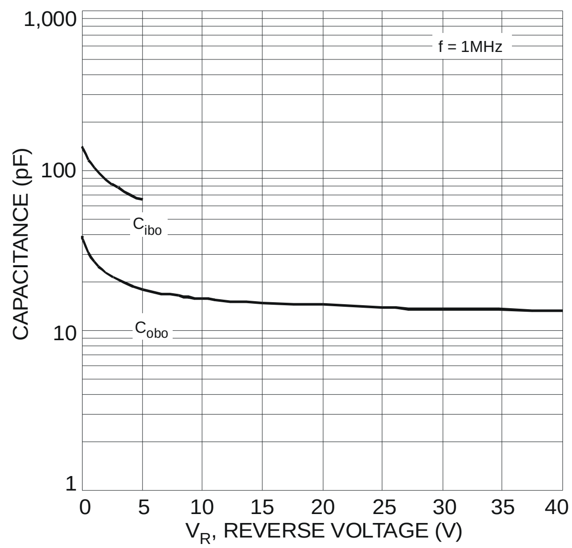


Fig. 9 Typical Capacitance Characteristics

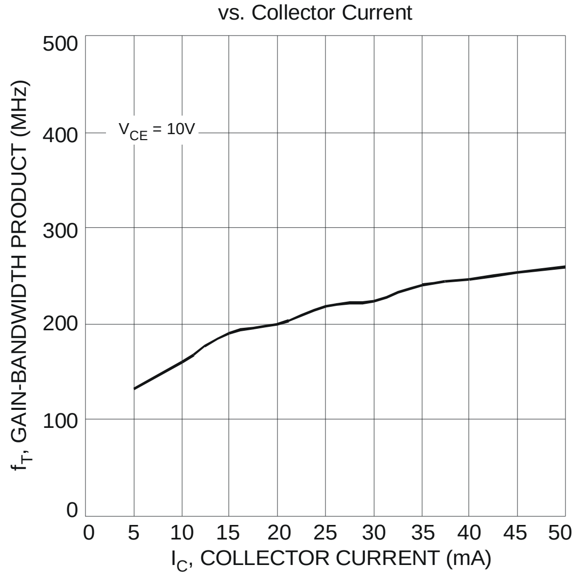


Fig. 10 Typical Gain-Bandwidth Product vs. Collector Current

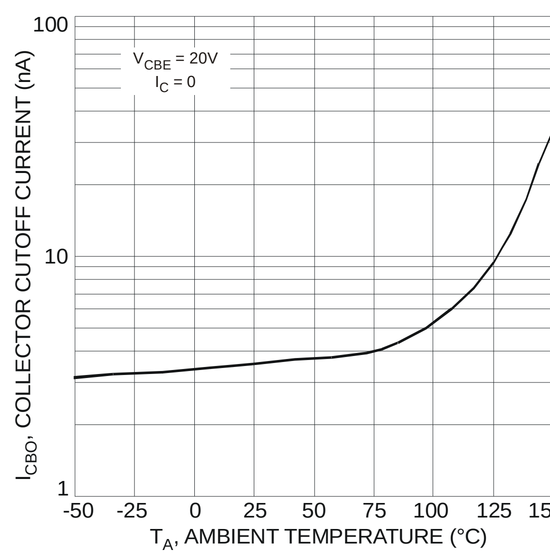
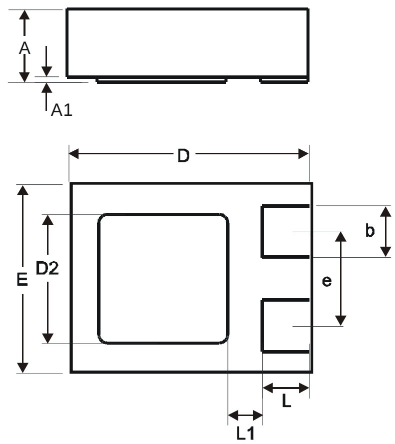


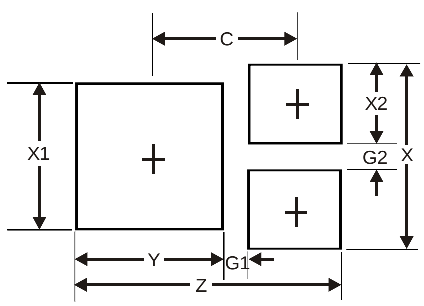
Fig. 11 Collector Cutoff Current vs. Ambient Temperature

Package Outline Dimensions



DFN1411-3			
Dim	**Min**	**Max**	**Typ**
A	0.47	0.53	0.50
A1	0	0.05	0.02
b	0.25	0.35	0.30
D	1.35	1.475	1.40
D2	0.65	0.85	0.75
E	1.05	1.18	1.10
e	—	—	0.55
L	0.225	0.325	0.275
L1	—	—	0.20
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	1.38
G1	0.15
G2	0.15
X	0.95
X1	0.75
X2	0.40
Y	0.75
C	0.76

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