





HIGH GAIN, LOW $V_{\text{CE(SAT)}}$ 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

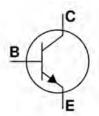
- Case: DFN1411-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.003 grams (approximate)

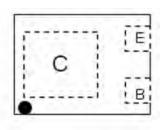
Applications

- 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

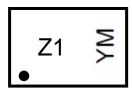
Ordering Information

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	200	9	2010		2011	20	12	2013		2014	- 2	2015
Code	W		Х		Υ		Z	Α		В		С
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	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)	Ic	1.5	Α
Peak Pulse Current	I _{CM}	4	Α
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	$R_{ heta JA}$	125	°C/W
Thermal Resistance, Junction to Ambient (Note 3) @ T _A = 25°C	$R_{ heta JA}$	330	°C/W
Operating and Storage Temperature Range	$T_{J_i}T_{STG}$	-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

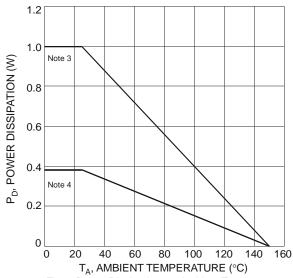


Fig. 1 Power Dissipation vs. Ambient Temperature

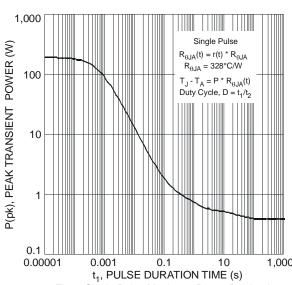


Fig. 2 Single Pulse Maximum Power Dissipation

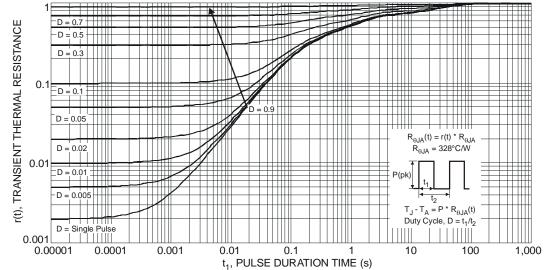


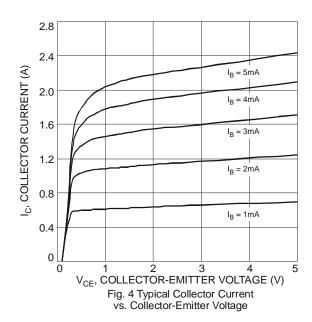
Fig. 3 Transient Thermal Response

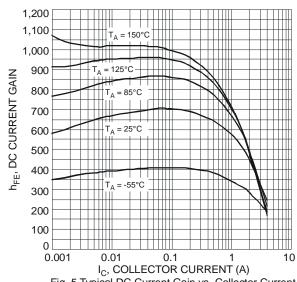


Electrical Characteristics (at T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V _{(BR)CBO}	20	_	_	V	$I_C = 100 \mu A, I_E = 0A$
Collector-Emitter Breakdown Voltage (Note 5)	V _{(BR)CEO}	20	_	_	V	$I_{C} = 10 \text{mA}, I_{B} = 0 \text{A}$
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	7	_	_	V	$I_E = 100 \mu A, I_C = 0A$
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5	_	_	V	$I_E = 100 \mu A, I_B = 0 A$
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	lebo	_	_	100	nA	$V_{BE} = 5.6V, I_{C} = 0A$
DC Current Gain (Note 5)	h _{FE}	300 290 270	_	1000 —	_	V _{CE} = 2V, I _C = 100mA V _{CE} = 2V, I _C = 0.5A
		200		_		$V_{CE} = 2V$, $I_C = 1A$ $V_{CE} = 2V$, $I_C = 2A$
	V _{CE(SAT)}	_	_	45	mV	$I_C = 100 \text{mA}, I_B = 1 \text{mA}$
		_	_	70	mV	$I_C = 500 \text{mA}, I_B = 25 \text{mA}$
Collector-Emitter Saturation Voltage (Note 5)		_	_	125	mV	$I_C = 1A, I_B = 50mA$
Concetor Emitter Saturation Voltage (Note 5)		_	_	225	mV	$I_C = 1.5A$, $I_B = 30mA$
		_	_	225	mV	$I_C = 2A$, $I_B = 100mA$
		_	_	290	mV	$I_C = 2A$, $I_B = 40mA$
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	
Delay Time	t _d	_	20	_	ns]
Rise Time	t _r	_	40	_	ns	$V_{CC} = 10V, I_{C} = 1A$
Turn-Off Time	t _{off}	_	225	_	ns	$I_{B2} = -I_{B1} = 50 \text{mA}$
Storage Time	ts	_	205	_	ns]
Fall Time	t _f		20	_	ns	

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







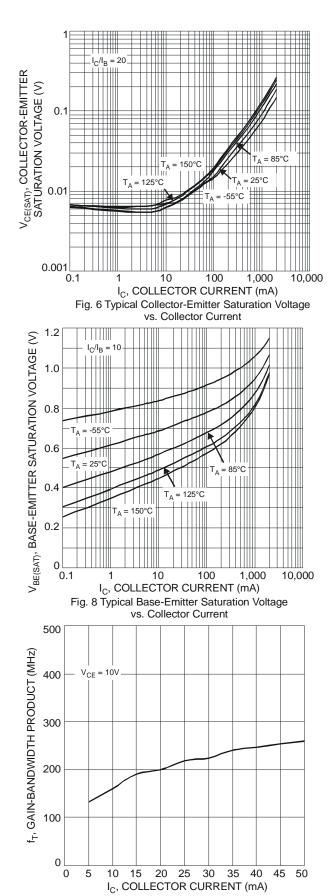
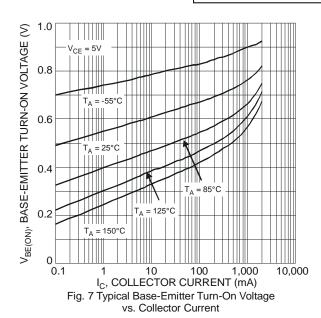
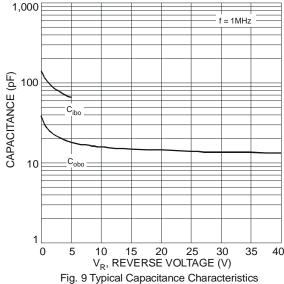


Fig. 10 Typical Gain-Bandwidth Product vs. Collector Current





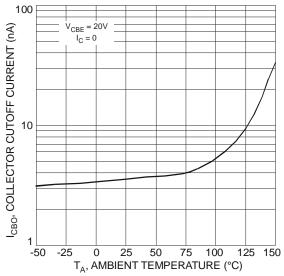
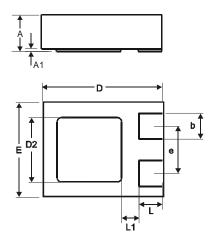


Fig. 11 Collector Cutoff Current vs. Ambient Temperature

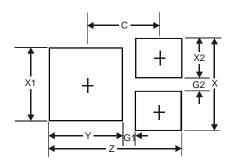


Package Outline Dimensions



DFN1411-3						
Dim	Min	Max	Тур			
Α	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			
Е	1.05	1.18	1.10			
е		_	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
Х	0.95
X1	0.75
X2	0.40
Y	0.75
C	0.76





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