



# **MMBT6427**

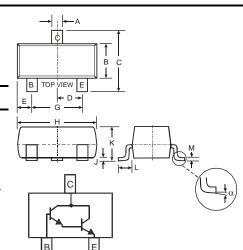
#### NPN SURFACE MOUNT DARLINGTON TRANSISTOR

### **Features**

- **Epitaxial Planar Die Construction**
- Ideal for Low Power Amplification and Switching
- High Current Gain
- Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 1 and 4)

### **Mechanical Data**

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking (See Page 3): K1D
- Ordering & Date Code Information: See Page 3
- Weight: 0.008 grams (approximate)



	SOT-23			
Dim	Min	Max		
Α	0.37	0.51		
В	1.20	1.40		
С	2.30	2.50		
D	0.89	1.03		
Е	0.45	0.60		
G	1.78	2.05		
Н	2.80	3.00		
J	0.013	0.10		
K	0.903	1.10		
L	0.45	0.61		
M	0.085	0.180		
α	0°	8°		
All Din	nensions	in mm		

### **Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	40	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	12	V
Collector Current - Continuous	Ic	500	mA

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 2) @ T <sub>A</sub> = 25°C	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient (Note 2)@ T <sub>A</sub> = 25°C	$R_{ heta JA}$	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## Electrical Characteristics @TA = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 3)					
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	40	_	V	$I_C = 100 \mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	40	_	V	$I_C = 10 \text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	12	_	V	$I_E = 10\mu A, I_C = 0$
Collector Cutoff Current	I <sub>CBO</sub>	_	50	nA	$V_{CB} = 30V, I_{E} = 0$
Collector Cutoff Current	ICEO	_	1.0	μΑ	$V_{CE} = 25V, I_B = 0$
Emitter Cutoff Current	I <sub>EBO</sub>		50	nA	$V_{EB} = 10V, I_C = 0$
ON CHARACTERISTICS (Note 3)					
DC Current Gain	h <sub>FE</sub>	10,000 20,000 14,000	100,000 200,000 140,000	_	$I_C = 10mA, V_{CE} = 5.0V$ $I_C = 100mA, V_{CE} = 5.0V$ $I_C = 500mA, V_{CE} = 5.0V$
Collector-Emitter Saturation Voltage		_	1.2 1.5	V	$I_C = 50$ mA, $I_B = 0.5$ mA $I_C = 500$ mA, $I_B = 0.5$ mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	_	2.0	V	$I_C = 500 \text{mA}, I_B = 0.5 \text{mA}$
Base-Emitter On Voltage	V <sub>BE(ON)</sub>	_	1.75	V	$I_C = 50 \text{mA}, V_{CE} = 5.0 \text{V}$
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	Cobo	8.0 Typical		pF	$V_{CB} = 10V, f = 1.0MHz, I_{E} = 0$
Input Capacitance	C <sub>ibo</sub>	15 T	ypical	pF	$V_{EB} = 0.5V$ , $f = 1.0MHz$ , $I_{C} = 0$

Notes:

- 1. No purposefully added lead. Halogen and Antimony Free.
- Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
- Short duration pulse test used to minimize self-heating effect.
- Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.



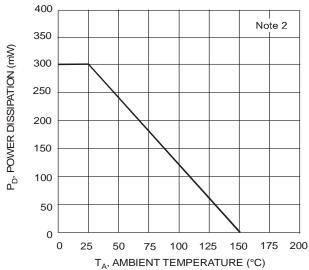
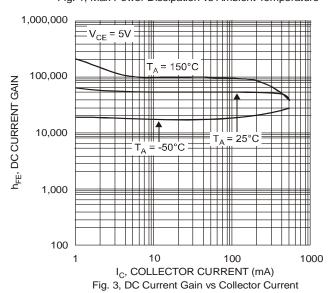


Fig. 1, Max Power Dissipation vs Ambient Temperature



1000  $V_{CE} = 5V$ f<sub>T</sub>, GAIN BANDWIDTH PRODUCT (MHz) 100 10 1 10 100 I<sub>C</sub>, COLLECTOR CURRENT (mA) Fig. 5, Gain Bandwidth Product vs Collector Current

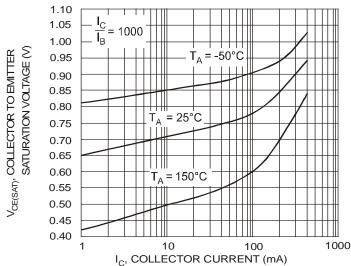


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

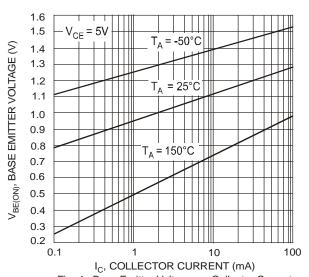


Fig. 4, Base Emitter Voltage vs. Collector Current

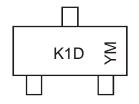


#### Ordering Information (Note 5)

Device	Packaging	Shipping
MMBT6427-7-F	SOT-23	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

### **Marking Information**



K1D = Product Type Marking Code YM = Date Code Marking Y = Year ex: N = 2002 M = Month ex: 9 = September

Date Code Kev

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	Г	М	Ν	Р	R	S	Т	U	V	W	Х	Υ	Z

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

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