

### 12V LOW V<sub>CE(sat)</sub> PNP SURFACE MOUNT TRANSISTOR

#### **Features**

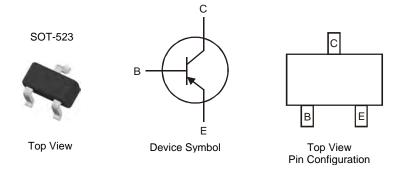
- Low Collector-Emitter Saturation Voltage, VCE(sat)
- Ultra-Small Surface Mount Package
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- ESD rating: 400V-MM, 8KV-HBM

#### **Applications**

- DC-DC converter
- Portable equipments
- Power management units

### **Mechanical Data**

- Case: SOT-523
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.002 grams (approximate)



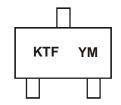
## **Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
2DA2018-7	KTF	7	8mm	3,000

Notes:

- 1. No purposefully added lead.
- 2. Diodes Inc's "Śreen" Policy can be found on our website at http://www.diodes.com
- 3. For packaging details, go to our website at http://www.diodes.com

# **Marking Information**



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

www Date Code Keyon

Year	2009		2010	2011		2012	2013		2014	2015		2015
Code	W		Χ	Υ		Z	Α		В	С		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 @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-15	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-12	V
Emitter-Base Voltage	V <sub>EBO</sub>	-6	V
Collector Current - Continuous	Ic	-500	mA
Peak Pulse Collector Current	I <sub>CM</sub>	-1	A

#### **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ T <sub>A</sub> = 25°C	P <sub>D</sub>	150	mW
Thermal Resistance, Junction to Ambient (Note 4) @ T <sub>A</sub> = 25°C	$R_{ hetaJA}$	833	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 4. Device mounted on FR-4 PCB with minimum recommended pad layout.

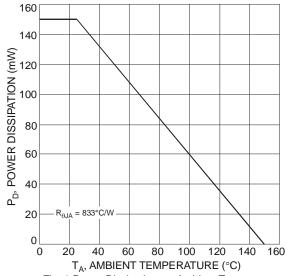


Fig. 1 Power Dissipation vs. Ambient Temperature

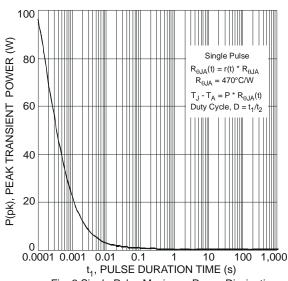


Fig. 2 Single Pulse Maximum Power Dissipation

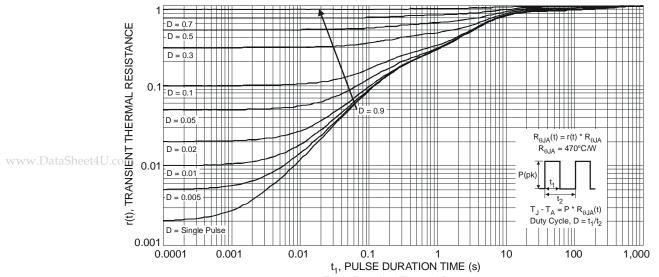


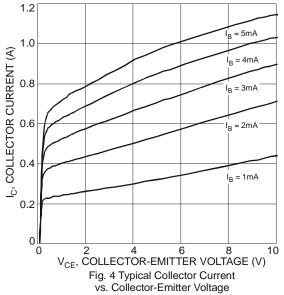
Fig. 3 Transient Thermal Response

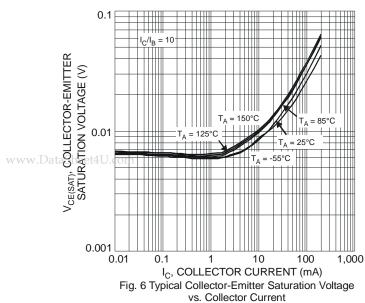


# Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-15	_	_	V	$I_C = -10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage (Note 5)	BV <sub>CEO</sub>	-12	_	_	V	$I_C = -1 \text{ mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-6			V	$I_E = -10\mu A, I_C = 0$
Collector Cutoff Current	I <sub>CBO</sub>		_	-100 -50		$V_{CB} = -15V, I_E = 0$ $V_{CB} = -15V, I_E = 0, T_A = 150$ °C
Emitter Cutoff Current	I <sub>EBO</sub>	_	_	-100	nA	$V_{EB} = -6V, I_C = 0$
DC Current Gain (Note 5)	h <sub>FE</sub>	270		680		$V_{CE} = -2V, I_{C} = -10mA$
Collector-Emitter Saturation Voltage (Note 5)	V <sub>CE(sat)</sub>			-250	mV	$I_C = -200 \text{mA}, I_B = -10 \text{mA}$
Output Capacitance	$C_{obo}$		7.4		рF	$V_{CB} = -10V, f = 1.0MHz$
Current Gain-Bandwidth Product	f <sub>T</sub>		260		MHz	$V_{CE} = -2V$ , $I_{C} = -10mA$ , $f = 100MHz$
Turn-On Time	t <sub>on</sub>		40		ns	
Delay Time	t <sub>d</sub>		18		ns	
Rise Time	t <sub>r</sub>		22		ns	$V_{CC} = -6V$
Turn-Off Time	t <sub>off</sub>		106		ns	$I_C = -200 \text{mA}, I_{B1} = I_{B2} = -10 \text{mA}$
Storage Time	ts		87		ns	
Fall Time	t <sub>f</sub>		19		ns	

Notes: 5. Measured under pulsed conditions. Pulse width =  $300\mu$ s. Duty cycle  $\leq 2\%$ .





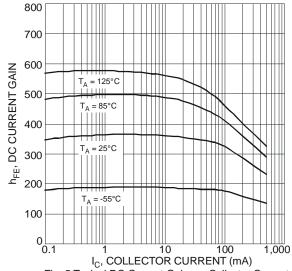
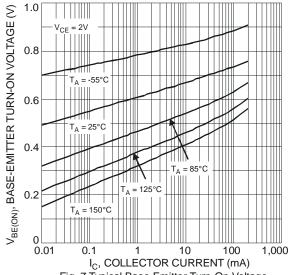
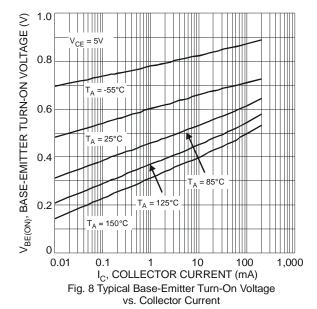
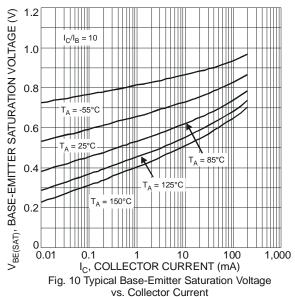


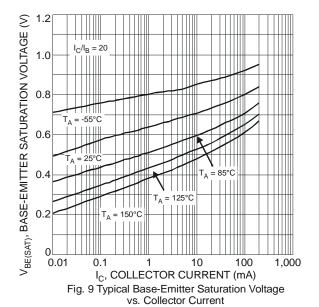
Fig. 5 Typical DC Current Gain vs. Collector Current











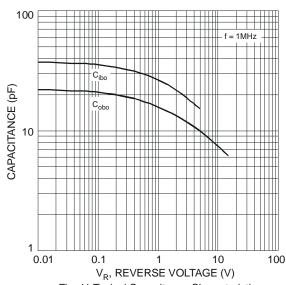
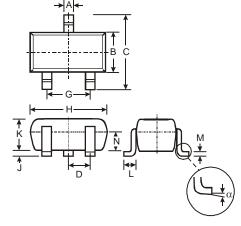


Fig. 11 Typical Capacitance Characteristics

# **Package Outline Dimensions**

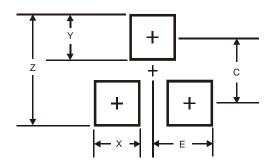




SOT-523						
Dim	Min	Max	Тур			
Α	0.15	0.30	0.22			
В	0.75	0.85	0.80			
С	1.45	1.75	1.60			
D	_	_	0.50			
G	0.90	1.10	1.00			
Н	1.50	1.70	1.60			
J	0.00	0.10	0.05			
K	0.60	0.80	0.75			
L	0.10	0.30	0.22			
M	0.10	0.20	0.12			
N	0.45	0.65	0.50			
α	0°	8°	_			
All Dimensions in mm						



#### **Suggested Pad Layout**



Dimensions	Value (in mm)
Z	1.8
Х	0.4
Υ	0.51
С	1.3
E	0.7

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