BAT54, BAT54A, BAT54C, BAT54S

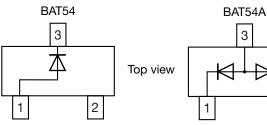
Vishay Semiconductors

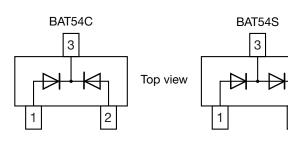
Small Signal Schottky Diodes, Single and Dual

2

2





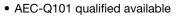


LINKS TO ADDITIONAL RESOURCES



FEATURES

- These diodes feature very low turn-on voltage and fast switching
- These devices are protected by a PN junction guardring against excessive voltage, such as electrostatic discharges



- Molding compound meets UL 94 V-0
 flammability rating
- Moisture Sensitivity Level (MSL) 1
- Base P/N-E3 RoHS-compliant, commercial grade
- Base P/N-HE3 RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

MECHANICAL DATA

Case: SOT-23

Weight: approx. 9.2 mg

Packaging codes / options:

18/10K per 13" reel (8 mm tape), 10K/box

08/3K per 7" reel (8 mm tape), 15K/box

PARTS TABLE							
PART	ORDERING CODE	AEC-Q101 QUALIFIED	TYPE MARKING	CIRCUIT CONFIGURATION	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY	
BAT54	BAT54-E3-08	no			3 000	15 000	
	BAT54-HE3_A-08	yes	L8	Single	(8 mm tape on 7" reel)		
	BAT54-E3-18	no	LO	Single	10 000	10 000	
	BAT54-HE3_A-18	yes			(8 mm tape on 13" reel)	10 000	
BAT54A	BAT54A-E3-08	no	L46	Common anode	3 000	15 000	
	BAT54A-HE3_A-08	yes			(8 mm tape on 7" reel)	15 000	
	BAT54A-E3-18	no			10 000	10 000	
	BAT54A-HE3_A-18	yes			(8 mm tape on 13" reel)	10 000	
	BAT54C-E3-08	no			3 000	15 000	
BAT54C	BAT54C-HE3_A-08	yes	L47	Common cathode	(8 mm tape on 7" reel)	15 000	
DA1340	BAT54C-E3-18	no	L47	Common calhode	10 000	10 000	
	BAT54C-HE3_A-18	yes			(8 mm tape on 13" reel)	10 000	
BAT54S	BAT54S-E3-08	no			3 000	15 000	
	BAT54S-HE3_A-08	yes	L48	Dual serial	(8 mm tape on 7" reel)	15 000	
	BAT54S-E3-18	no	L40		10 000	10.000	
	BAT54S-HE3_A-18	yes			(8 mm tape on 13" reel)	10 000	

Rev. 1.1, 21-Feb-2024

Document Number: 86410

For technical questions within your region: <u>DiodesAmericas@vishay.com</u>, <u>DiodesAsia@vishay.com</u>, <u>DiodesEurope@vishay.com</u> THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT <u>www.vishay.com/doc?91000</u>

1

AUTOMOTIVE GRADE Available Pb-free COMPLIANT





www.vishay.com

BAT54, BAT54A, BAT54C, BAT54S

Vishay Semiconductors

PACKAGE						
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS		
SOT-23	9.2 mg	UL 94 V-0	MSL 1 (according J-STD-020)	Peak temperature max. 260 °C		

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)					
PARAMETER TEST CONDITION		SYMBOL	VALUE	UNIT	
Repetitive peak reverse voltage		$V_{RRM} = V_{RWM} = V_{R}$	30	V	
Forward continuous current ⁽¹⁾		I _F	200	mA	
Repetitive peak forward current (1)		I _{FRM}	300	mA	
Surge forward current ⁽¹⁾	t _p < 1 s	I _{FSM}	600	mA	
Power dissipation	on FR-4 board with recommended soldering footprint	Р	230	mW	
Fower dissipation	Infinite heatsink	P _{tot}	330	mW	

Note

(1) Infinite heatsink

THERMAL CHARACTERISTICS ($T_{amb} = 25 \degree C$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Thermal resistance junction to ambient air	according to JEDEC [®] 51-3 on FR-4 board with recommended soldering footprint	R _{thJA}	430	K/W		
Thermal resistance junction lead	Infinite heatsink	R _{thJL}	300	K/W		
Junction temperature		Тj	125	°C		
Storage temperature range		T _{stg}	-65 to +150	°C		
Operating temperature range		T _{op}	-55 to +125	°C		

ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Reverse breakdown voltage	I _R = 100 μA (pulsed)	V _{BR}	30			V
Leakage current ⁽¹⁾	at V _R = 25 V	I _R			2	μA
	I _F = 0.1 mA	V _F			240	mV
	I _F = 1 mA	V _F			320	mV
Forward voltage ⁽¹⁾	I _F = 10 mA	V _F			400	mV
	I _F = 30 mA	V _F			500	mV
	I _F = 100 mA	V _F			800	mV
Diode capacitance	V _R = 1 V; f = 1 MHz	CD			10	pF
Reverse recovery time	I_F = I_R = 10 mA, i_R = 1 mA, R_L = 100 Ω	t _{rr}			5	ns

Note

 $^{(1)}$ Pulse test; $t_p \leq 300~\mu s,~duty~cycle~t_p/T < 0.02$

Rev. 1.1, 21-Feb-2024

2



BAT54, BAT54A, BAT54C, BAT54S

Vishay Semiconductors

TYPICAL CHARACTERISTICS ($T_{amb} = 25 \text{ °C}$, unless otherwise specified)

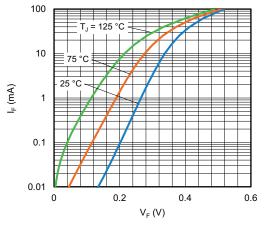


Fig. 1 - Typical Forward Current vs. Forward Voltage

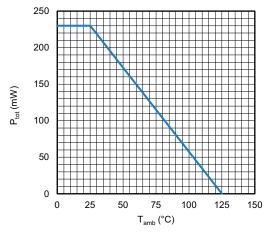


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

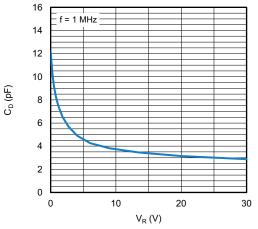


Fig. 3 - Typical Capacitance vs. Reverse Voltage

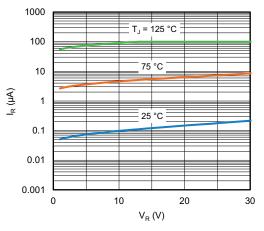
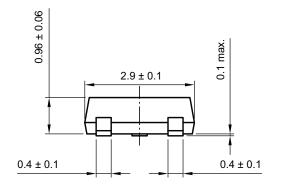


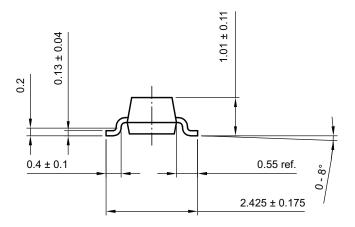
Fig. 4 - Typical Reverse Leakage Current vs. Reverse Voltage

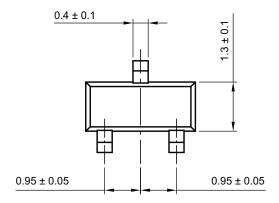


Vishay Semiconductors

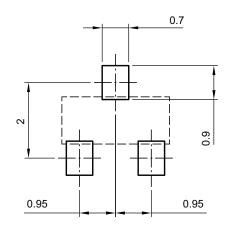
PACKAGE DIMENSIONS in millimeters: SOT-23







footprint recommendation:



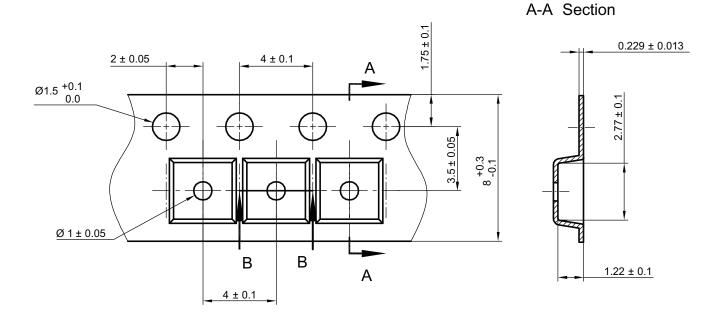
Created - Date: 18-Oct-2021 Rev. 01 - Date: 18-Jan-2022 S8-V-3929.01-009 (4)



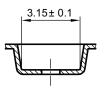
BAT54, BAT54A, BAT54C, BAT54S

Vishay Semiconductors

CARRIER TAPE SOT-23

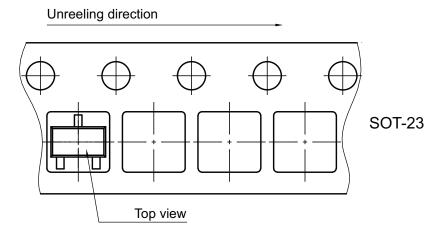


B-B Section



Created Date: 04-Feb-2010 Rev. Date: 07-Feb-2022

ORIENTATION IN CARRIER TAPE SOT-23



Created Date: 04-Feb-2010 Rev. Date: 07-Nov-2022

Rev. 1.1, 21-Feb-2024

Document Number: 86410

For technical questions within your region: <u>DiodesAmericas@vishay.com</u>, <u>DiodesAsia@vishay.com</u>, <u>DiodesEurope@vishay.com</u> THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT <u>www.vishay.com/doc?91000</u>



Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

© 2025 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED

Revision: 01-Jan-2025

1