

CERTIFICATE OF COMPLIANCE

Certificate Number UL-US-2020303-0
Report Reference E230531-20210323
Date 12-Apr-2021

Issued to: LITTELFUSE INC
8755 W Higgins Rd, Suite 500 Chicago, IL
United States 60631

This is to certify that representative samples of QVGQ2 - Isolated Loop Circuit Protectors - Component
See Addendum Page for Product Designation(s).

Have been investigated by UL in accordance with the component requirements in the Standard(s) indicated on this Certificate. UL Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for installation in complete equipment submitted for investigation to UL LLC.

Standard(s) for Safety: UL 497B, 4th Ed., Issue Date: 2004-06-14, Revision Date: 2017-02-10

Additional Information: See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information

This *Certificate of Compliance* does not provide authorization to apply the UL Recognized Component Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Recognized Component Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Recognized Component Mark on the product.



Bruce Mahrenholz, Director North American Certification Program

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



CERTIFICATE OF COMPLIANCE

Certificate Number UL-US-2020303-0
Report Reference E230531-20210323
Date 12-Apr-2021

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Model	Category Description
TVS Diode, Asymmetric Series, TPSMB2616CA	Telecom Protectors



Bruce Mahrenholz, Director North American Certification Program

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LOCATION

1030643 (Party Site)
Littelfuse Semiconductor (Wuxi) Co Ltd
3# Zhen Fa 6 Road
Shuo Fang New District
Wuxi Jiangsu 214142 CN
Factory ID: (none)
UL Contracting Party for above site is: UL GmbH

(939149-001) 130643 (Party Site)
SUZHOU GOOD-ARK ELECTRONICS CO LTD
TONGAN ECONOMIC DEVELOPMENT ZONE
31 TONG XI RD
SUZHOU JIANGSU 215153 CN
Factory ID: xx6xx
UL Contracting Party for above site is: UL GmbH

(100235-467) 612602 (Party Site)
TAK CHEONG
Tak Cheong Industrial Zone
Bubian
Shanwei Guangdong 516600 CN
Factory ID: xxTxx
UL Contracting Party for above site is: UL GmbH

2732366 (Party Site)
Wuhu Dynamic Semiconductor Co Ltd
No. 3 Workshop, No. 12, Ouyanghu Road, Wuhu Economic Technology Development
Zonejiujiang District
Wuhu City ANHUI PROVINCE 241000 CN
Factory ID: xx8xx
UL Contracting Party for above site is: UL GmbH

(100593-090) 656414 (Party Site)
JINAN E-TECH SEMICONDUCTOR LTD
#6 Taixing St.
Jiyang County
Jinan Shandong 251400 CN
Factory ID: xx1xx
UL Contracting Party for above site is: UL GmbH



ML FILE NO. E223026

Issued: 2003-06-23
 Revised: 2018-04-16

MULTIPLE RECOGNITION
 of
 ISOLATED LOOP CIRCUIT PROTECTORS - COMPONENT
 (QVGQ2)

for
 [645530] MDE SEMICONDUCTOR INC

Basically Recognized for

[352640] LITTELFUSE INC (NBK)

Basically Recognized products covered by Procedure and/or Reports under File No. E230531, Volume 1

Products Covered	Report Date	Basic Applicant's (Supplier's) Product Designations	Multiple Listee's Product Designations
Transient voltage suppressors (surface mount)		3T064 through 3T350	P0640 through P3500
		SMAJ5.0 through SMAJ170	SMAJ5.0 through SMAJ170
		SMBJ5.0 through SMBJ170	SMBJ5.0 through SMBJ170
		SMCJ5.0 through SMCJ170	SMCJ5.0 through SMCJ170
Transient voltage suppressors (axial leads)		SMDJ5.0 through SMDJ170	SMDJ5.0 through SMDJ170
		P4KE6.8 - P4KE440	P4KE6.8 - P4KE440
		P6KE6.8 - P6KE440	P6KE6.8 - P6KE440
		1.5KE6.8 - 1.5KE440	1.5KE6.8 - 1.5KE440
		20KPA20 - 20-KPA300	20KPA20 - 20KPA300
		30KPA30 - 30KPA288	30KPA30 - 30KPA288
		3KP5.0 - 3KP180	3KP5.0 - 3KP180
		5KP5.0 - 5KP180	5KP5.0 - 5KP180
		15KPA17 - 15KPA280	15KPA17 - 15KPA280
		LCE6.5 - LCE28	LCE6.5 - LCE28
	SA5.0 - SA180	SA5.0 - SA180	
	SAC5.0 - SAC50	SAC5.0 - SAC50	
	3T064 - 3T350	P0640 through P3500	
	Transink 25 - 200	Max25 - Max200	

MARKING: Same as that described in Follow-Up Service Procedure and/or Report except for Multiple Listee's name, file number, Trademark / Tradename, when applicable, and product designation.

LITERATURE: If literature is packaged with the Multiple Listed product(s) it shall be in compliance with the requirements outlined in the appropriate UL Standard(s).



Multiple Recognition Correlation Sheet

ML FILE NO. E315008

Issued: 2007-07-30

Revised: 2018-04-16

MULTIPLE RECOGNITION
of
ISOLATED LOOP CIRCUIT PROTECTORS - COMPONENT
(QVGQ2)
for

[660274] TAITRON COMPONENTS INC

Basically Recognized for:

[352640] LITTELFUSE INC (NBK)

Basically Recognized products covered by Procedure and/or Reports under File No. E230531, Volume 1

Products Covered	Report Date	Basic Applicant's (Supplier's) Product Designation	Multiple Listee's Product Designations		
Transient voltage suppressor (axial leads)	2003-01-18	Series P4KE	Series P4KE		
		Series P6KE	Series P6KE		
		Series 1.5KE	Series 1.5KE		
		Series 5KP	Series 5KP		
		Series SA	Series SA		
		Series 1.5SMC	Series 1.5SMCJ		
		Series SAC	Series SAC		
		Series LCE	Series LCE		
		Series 3KP	Series 3KP		
		Series 15KPA	Series 15KPA		
		Series 20KPA	Series 20KPA		
		Series 30KPA	Series 30KPA		
		Transient voltage surge suppressors	2003-01-17	Series SMAJ	Series SMAJ
				Series P4SMA	Series P4SMA
Series SMBJ	Series SMBJ				
Series P6SMB	Series P6SMB				
Series SMCJ	Series SMCJ				
Series SMDJ	Series 3.0SMCJ				
Series 5.0SMDJ	Series 5.0SMCJ				
	2007-08-20	Series SACB	Series SACB		

MARKING: Same as that described in Follow-Up Service Procedure and/or Report except for Multiple Listee's name, file number, Trademark / Tradename, when applicable, and product designation.

LITERATURE: If literature is packaged with the Multiple Listed product(s) it shall be in compliance with the requirements outlined in the appropriate UL Standard(s).

File E230531
Project 4789700746

March 23, 2021

REPORT

on

COMPONENT - ISOLATED LOOP CIRCUIT PROTECTORS

Littelfuse, Inc.
Chicago, IL

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UL LLC authorizes the above named company to reproduce the latest pages of that portion of this Report consisting of this Cover Page through Page 3.

DESCRIPTION

PRODUCT COVERED:

USR TVS Diode, Asymmetric Series, Part No. TPSMB2616CA.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

General - The TVS Diode described in this Report are low capacitance TVS protection for telecommunication or data loop circuits. They have a different voltage ratings depending on the polarity of the component. They prevent possible damage to integrated circuits, voltage sensitive semi-conductors and components from surges caused by lightning, electrostatic discharges, inductive switching, etc. They are made using an industry known DO-214AA physical package.

USR indicates evaluation to UL 497B, UL 497B, The Standard for Protectors for Data Communications and Fire-Alarm Circuits, 4th Edition, dated June 14th, 2004 including revisions through February 10th, 2017.

RATINGS:

Part No.	Strike Voltage, Vdc @ 100 V/s		Impulse Voltage, Vdc @ 100 V/ μ S
	Forward Bias	Reverse Bias	
TPSMB2616CA	17.8-19.7	28.9-31.9	<1000

CONDITIONS OF ACCEPTABILITY:

This device was tested under ordinary indoor locations and the acceptability of the combination for use in complete equipment is determined by Underwriters Laboratories Inc. Such conditions as circuit heating and circuit operating voltage should be taken into consideration when these devices are employed in the circuit. This device is intended for use on printed wiring boards which have a dielectric and temperature rating exceeding that of the device employed. The Overvoltage Test per UL 60950-1, or Limited Short Circuit Current Test per UL 497 have not been conducted on this device.

Installation - The surge suppressor covered by this Report is normally connected in parallel with the equipment it is intended to protect.

PRODUCT LITERATURE:

Sales literature and/or specification documents that accompany product shipment shall have Breakdown Voltage ranges as seen in ILL. 1.

INSTALLATION:

The arrays covered by this Report are normally connected in parallel with the equipment it is intended to protect. Under nonsurge conditions they exhibit a high impedance such that normal operation of the equipment is unaffected. In the presence of surges, however, they enter a clamping mode of operation so as to shunt the destructive energy of the surge away from the sensitive equipment. They are intended to be installed in accordance with the applicable requirements of the National Electrical Code and the local authorities having jurisdiction.

CONSTRUCTION DETAILS:

General - The details of the construction are shown in the following photographs, associated descriptive pages, and drawings. The general design, and arrangement shall be as shown unless otherwise indicated.

Spacing - A minimum spacing of 1/8 in. (3.17 mm) through air and over surface shall be maintained between current carrying parts, such as the leads of the transient voltage surge suppressor.

MARKING:

General - Recognized Company name (or logo), Component Recognition Mark, and part number designation shall be on the component or smallest shipping container.

TVS Diode, Asymmetric Series, Part No. TPSMB2616CA - ILL. 1

General - See ILL. 1 for details and dimensions of the TPSMB2616CA component, including ratings.

1. Body - R/C (QMFZ2) Epoxy or plastic material, rated V-0 minimum.
2. Leads - Tin plated copper alloy.

INDEX

Product and Model No.	Section	Report Date
Model Series 3T, SMAJ, SMBJ, SMCJ, SMCJ-HR, 3.0SMCJ, SMDJ or TPSMD, SMDJ-1000, 4.0SMDJ, TP5KSMD, 5.0SMDJ, SMA6J, SMCJ, 1KSMB, 1.5SMB, SMBLCE, SMCLCE, SMDLCE, 8.0SMDJ, 8.0SMDJ38CA-ZT, SMA6L, TPSMA6L.	1	2003-01-17
Model Series BZW04P, P4SMA, TP4SMA, TP4KE, P4KE, P6SMB, P6KE, TP6KE, TPSMB, TPSMC, 1.5, TP1.5KE (or 1.5KE), 1.5SMC, , TP3KP, 5KP, TP5KP, 15KPA, TP15KPA, 20KPA, TP20KPA, 30KPA, TP30KA, LCE, SA, TPSA, SAC, SLD, TLP, TLPA, SLD5S, SLD6S, SLD8S, SMTOAK2	2	2003-01-18
Model Series SACB.	3	2007-08-20
Part No. TPSMB2616CA	4	2021-03-23
TVS Diodes (surface mount), Series SMF4L, TVS Diode (surface mount), Part No. HSMF4L5.5A	5	2015-10-07
TVS Diode, Part No. SMF3.3 TVS Diode, Part No. SMF4.0	6	2016-08-22
TVS Diode, SMF Series	7	2022-12-16

FOLLOW-UP SERVICE PROCEDURE
(TYPE R)ISOLATED LOOP CIRCUIT PROTECTORS - COMPONENT
(QVGQ2)

Manufacturer:	SEE ADDENDUM FOR MANUFACTURER LOCATIONS
Applicant: (491993-001)	352640 (Party Site) LITTELFUSE INC 8755 W Higgins Rd, Suite 500 Chicago IL 60631 US
Recognized Company: (491993-001)	352640 (Party Site) SAME AS APPLICANT

Use of the Mark

This Follow-Up Service Procedure authorizes the above Manufacturer(s) to use the marking specified by UL LLC, or any authorized licensee of UL LLC, including the UL Contracting Party, only on products when constructed, tested and found to be in compliance with the requirements of this Follow-Up Service Procedure and in accordance with the terms of the applicable service agreement with UL Contracting Party. The UL Contracting Party for Follow-Up Services is listed in the addendum to this Follow-Up Service Procedure ("UL Contracting Party"). UL Contracting Party and UL LLC are referred to jointly herein as "UL."

It is the responsibility of the Applicant, Manufacturer(s), and Recognized Company to make sure that only the products meeting the aforementioned requirements bear the authorized Marks of UL LLC, or any authorized licensee of UL LLC.

Additional Responsibilities

Additional responsibilities, duties and requirements for the Applicant and Manufacturers are defined under Additional Resources at the following website: <https://www.ul.com/fus>. Manufacturers without Internet access may obtain the current version of these documents from their local UL customer service representative or UL field representative. For assistance, or to obtain a paper copy of these documents or the Follow-Up Service Terms referenced below, please contact UL's Customer Service at <https://www.ul.com/aboutul/locations/>, select a location and enter your request, or call the number listed for that location.

Acceptance of Follow-Up Services

The Applicant and the specified Manufacturer(s) and any Recognized Company in this Follow-Up Service Procedure must agree to receive Follow-Up Services from UL Contracting Party. If your applicable service agreement is a Global Services Agreement ("GSA"), the Applicant, the specified Manufacturer(s), and any Recognized Company will be bound to a Service Agreement for Follow-Up Services upon the earliest by any Subscriber of a) use of the prescribed UL Mark, b) acceptance of the factory inspection, or c) payment of the Follow-Up Service fees. The Service Agreement incorporates such GSA, this Follow-Up Service Procedure and the Follow-Up Service Terms which can be accessed by clicking the following link: <https://www.ul.com/resources/contracts/follow-up-service-terms>. In all other events, Follow-Up Services will be governed by and incorporate the terms of your applicable service agreement and this Follow-Up Service Procedure.

Use and Ownership of the Follow-Up Service Procedure

This Follow-Up Service Procedure, and any subsequent revisions, is the property of UL and is not transferable. This Follow-Up Service Procedure contains confidential information for use only by the Applicant, the specified Manufacturer(s), and representatives of UL and is not to be used for any other purpose. It is provided to the Subscribers with the understanding

that it is not to be copied, either wholly or in part unless specifically allowed, and that it will be returned to UL, upon request.

Definition of Terms

Capitalized terms used but not defined herein have the meanings set forth in the GSA and the applicable Service Terms or any other applicable UL service agreement.

No Third Party Liability

UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages arising out of or in connection with the use or reliance upon this Follow-Up Service Procedure to anyone other than the above Manufacturer(s) as provided in the agreement between UL LLC or an authorized licensee of UL LLC, including UL Contracting Party, and the Manufacturer(s).

Certification Body

UL LLC has signed below solely in its capacity as the certification body to indicate that this Follow-Up Service Procedure fulfills the requirements for certification documentation issued by the certification body. The certification body's accreditation status for the applicable certification scheme and identification of the accreditation body can be found at <https://www.ul.com/resources/accreditation>.

Deborah Jennings-Conner
VP Regulatory Services
UL LLC