

TISP4A265H3BJ

ASYMMETRICAL BIDIRECTIONAL THYRISTOR SPD

TISP4A265H3BJ LCAS R_{LINE} Protector

RING Line Protection for:
-LCAS (Line Card Access Switch)
-ADSL Interfaces

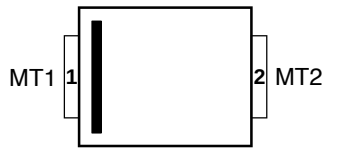
Voltages Optimized for:
-Battery-Backed Ringing Circuits
Maximum Ringing a.c.....90 V rms
Maximum Battery Voltage ..... -52 V
-ADSL Voltage..... ±23 V peak
-Minimum Ambient Temperature.....0 °C

Device	V_{DRM} V	$V_{(BO)}$ V
'4A265	+100	+125
	-200	-265

Rated for International Surge Wave Shapes

Wave Shape	Standard	I_{PPSM} A
2/10 µs	GR-1089-CORE	500
8/20 µs	IEC 61000-4-5	300
10/160 µs	TIA/EIA-IS-968	250
10/700 µs	ITU-T K.20/45/21	200
10/560 µs	TIA/EIA-IS-968	160
10/1000 µs	GR-1089-CORE	100

SMB Package (Top View)



MD4A265

Device Symbol



SD4XAN

Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

Agency Recognition

Description	
UL	File Number: E215609

.....UL Recognized Component

Description

The TISP4A265H3BJ is an asymmetrical bidirectional overvoltage protector. It is designed to limit the peak voltages on the ring line terminal of the '7581/2/3 LCAS (Line Card Access Switches). The TISP4A265H3BJ must be connected with bar-indexed terminal 1, MT1, to the protective ground and terminal 2, MT2, to the ring conductor.

The TISP4A265H3BJ voltages are chosen to give adequate LCAS ring line terminal protection for all switch conditions. The most potentially stressful condition is low level power cross when the LCAS switches are closed. Under this condition, the TISP4A265H3BJ limits the voltage and corresponding LCAS dissipation until the LCAS thermal trip operates and opens the switches.

Under open-circuit ringing conditions, the line ring conductor will have high peak voltages. For battery backed ringing, the ring conductor will have a larger peak negative voltage than positive, i.e. the peak voltages are asymmetric. The TISP4A265H3BJ has a similar voltage asymmetry and will allow the maximum possible ringing voltage, while giving the most effective protection. On a connected line, the tip conductor will have much smaller voltage levels than the open-circuit ring conductor values. Here a TISP4xxxH3BJ series, symmetrical voltage protector gives adequate protection.

Overvoltages are initially clipped by breakdown clamping. If sufficient current is available from the overvoltage, the breakdown voltage will rise to the breakover level, which causes the device to switch into a low-voltage on-state condition. This switching action removes the high voltage stress from the following circuitry and causes the current resulting from the overvoltage to be safely diverted through the protector. The high holding (switch off) current helps prevent d.c. latchup as the diverted current subsides.

WARNING Cancer and Reproductive Harm
www.P65Warnings.ca.gov

JANUARY 2002 – REVISED JULY 2019

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Description (Continued)

The TISP4A265H3BJ is guaranteed to voltage limit and withstand the listed international lightning surges in both polarities. This high (H) current protection device is in a plastic SMBJ package (JEDEC DO-214AA with J-bend leads) and supplied in embossed carrier reel pack. For alternative voltage and holding current values, consult the factory.

How to Order

Device	Package	Carrier	Order As
TISP4A265H3BJ	BJ (J-Bend DO-214AA/SMB)	R (Embossed Tape Reeled)	TISP4A265H3BJR-S

Absolute Maximum Ratings, T_A = 25 °C (Unless Otherwise Noted)

Rating	Symbol	Value	Unit
Repetitive peak off-state voltage, (see Note 1)	V_{DRM}	+100 -200	V
Non-repetitive peak on-state pulse current (see Notes 2, 3 and 4)	I_{TSP}		A
2/10 µs (GR-1089-CORE, 2/10 µs voltage wave shape)		500	
8/20 µs (IEC 61000-4-5, 1.2/50 µs voltage, 8/20 current combination wave generator)		300	
10/160 µs (TIA/EIA-IS-968 (Replaces FCC Part 68), 10/160 µs voltage wave shape)		250	
5/310 µs (ITU-T K.44, 10/700 µs voltage wave shape used in K.20/45/21)		200	
5/320 µs (TIA/EIA-IS-968 (Replaces FCC Part 68), 9/720 µs voltage wave shape)		200	
10/560 µs (TIA/EIA-IS-968 (Replaces FCC Part 68), 10/560 µs voltage wave shape)		160	
10/1000 µs (GR-1089-CORE, 10/1000 µs voltage wave shape)		100	
Non-repetitive peak on-state current (see Notes 2, 3 and 5)	I_{TSM}		A
20 ms (50 Hz) full sine wave		55	
16.7 ms (60 Hz) full sine wave		60	
1000 s 50 Hz/60 Hz a.c.		2.2	
Initial rate of rise of on-state current, Exponential current ramp, Maximum ramp value < 200 A	di_T/dt	400	A/µs
Junction temperature	T_J	-40 to +150	°C
Storage temperature range	T_{stg}	-65 to +150	°C

NOTES: 1. See Figure 7 for voltage values at other temperatures.
2. Initially, the TISP4A265H3BJ must be in thermal equilibrium with T_J = 25 °C.
3. The surge may be repeated after the TISP4A265H3BJ returns to its initial conditions.
4. See Figure 8 for current ratings at other temperatures.
5. EIA/JESD51-2 environment and EIA/JESD51-3 PCB with standard footprint dimensions connected with 5 A rated printed wiring track widths. See Figure 6 for the current ratings at other durations. Derate current values at -0.61 %/°C for ambient temperatures above 25 °C.

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Overload Ratings, T_A = 25 °C (Unless Otherwise Noted)

Rating	Symbol	Value	Unit
Maximum overload on-state current without open circuit, 50 Hz/60 Hz a.c. (see Note 6)			
0.03 s	$I_{T(OV)M}$	60	A rms
0.07 s		40	
1.6 s		8	
5.0 s		7	
1000 s		2.2	

NOTE 6: Peak overload on-state current during a.c. power cross tests of GR-1089-CORE and UL 1950/60950. These electrical stress levels may damage the TISP4A265H3BJ silicon chip. After test, the pass criterion is either that the device is functional or, if it is faulty, that it has a short circuit fault mode. In the short circuit fault mode, the following equipment is protected as the device is a permanent short across the line. The equipment would be unprotected if an open circuit fault mode developed.

Electrical Characteristics, T_A = 25 °C (Unless Otherwise Noted)

Parameter		Test Conditions		Min	Typ	Max	Unit
I_{DRM}	Repetitive peak off-state current	V_D = +100 V and -200 V	T_A = 25 °C			±5	μA
			T_A = 85 °C			±10	
$V_{(BO)}$	Breakover voltage	dv/dt = 250 V/ms, R_{SOURCE} = 300 Ω				+125 -265	V
$I_{(BO)}$	Breakover current	dv/dt = 250 V/ms, R_{SOURCE} = 300 Ω		±0.15		±0.6	A
I_H	Holding current	I_T = ±5 A, di/dt = +/-30 mA/ms		±0.15		±0.6	A
dv/dt	Critical rate of rise of off-state voltage	Linear voltage ramp, Maximum ramp value < 0.85V_{DRM}		±5			kV/μs
I_D	Off-state current	V_D = ±50 V	T_A = 85 °C			±10	μA
C_{off}	Off-state capacitance	f = 1 MHz, V_d = 1 V rms, (see Note 7)	V_D = 98 V		25	30	pF
			V_D = 50 V		30	36	
			V_D = 10 V		45	54	
			V_D = 5 V		52	62	
			V_D = 2 V		60	72	
			V_D = 1 V		65	79	
			V_D = 0		71	86	
			V_D = -1 V		65	79	
			V_D = -2 V		58	69	
			V_D = -5 V		48	57	
			V_D = -10 V		40	48	
			V_D = -50 V		26	31	
			V_D = -100 V		20	24	

NOTE 7: To avoid possible voltage clipping, the TISP4A265H3BJ is tested with V_D = +98 V in the positive polarity.

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Thermal Characteristics

Parameter	Test Conditions	Min	Typ	Max	Unit
$R_{\Theta JA}$ Junction to free air thermal resistance	EIA/JESD51-3 PCB, $I_T = I_{TSM(1000)}$, T_A = 25 °C, (see Note 8)			113	°C/W
	265 mm x 210 mm populated line card, 4-layer PCB, $I_T = I_{TSM(1000)}$, T_A = 25 °C		50		

NOTE 8: EIA/JESD51-2 environment and PCB has standard footprint dimensions connected with 5 A rated printed wiring track widths.

Parameter Measurement Information

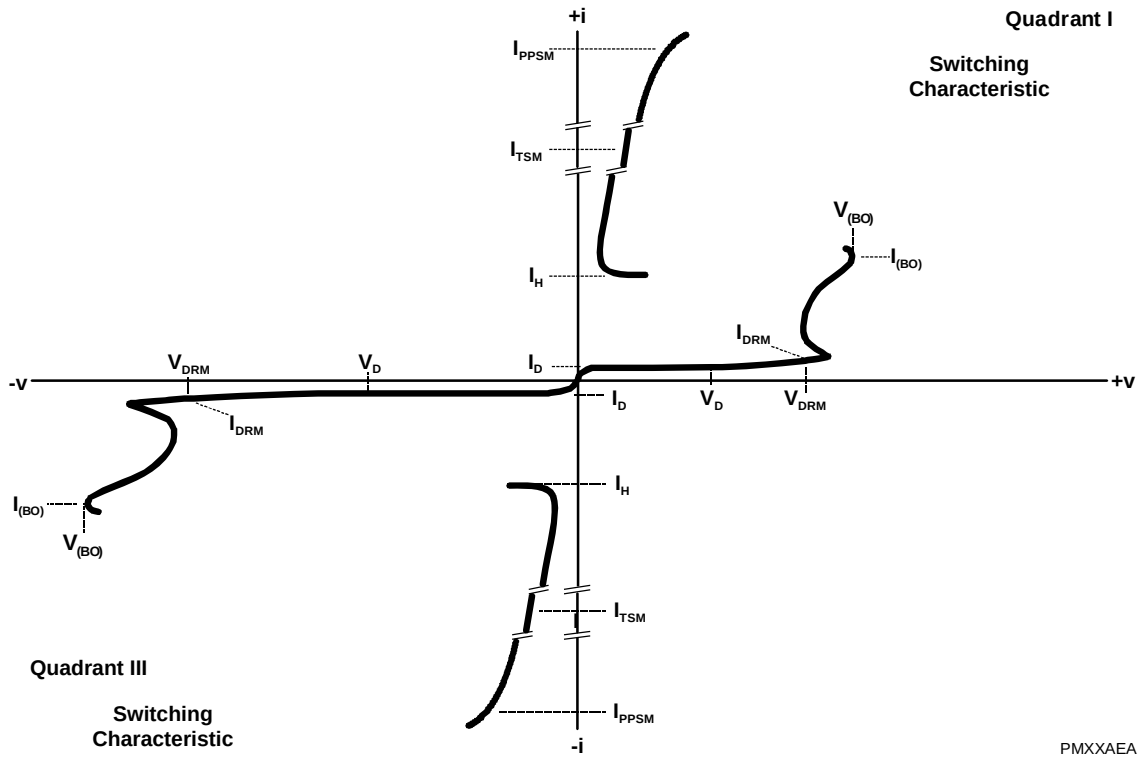


Figure 1. Voltage-Current Characteristic for MT1 and MT2 Terminals
All Measurements are Referenced to the MT1 Terminal

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Typical Characteristics

OFF-STATE CURRENT vs JUNCTION TEMPERATURE

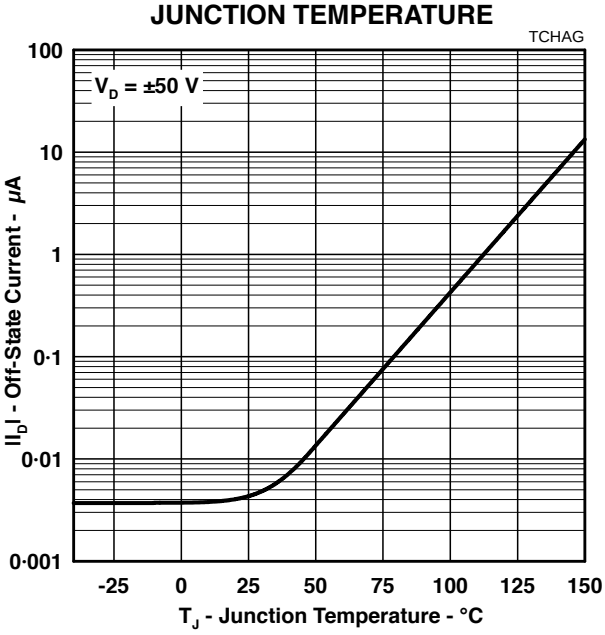


Figure 2.

NORMALIZED BREAKOVER VOLTAGE vs JUNCTION TEMPERATURE

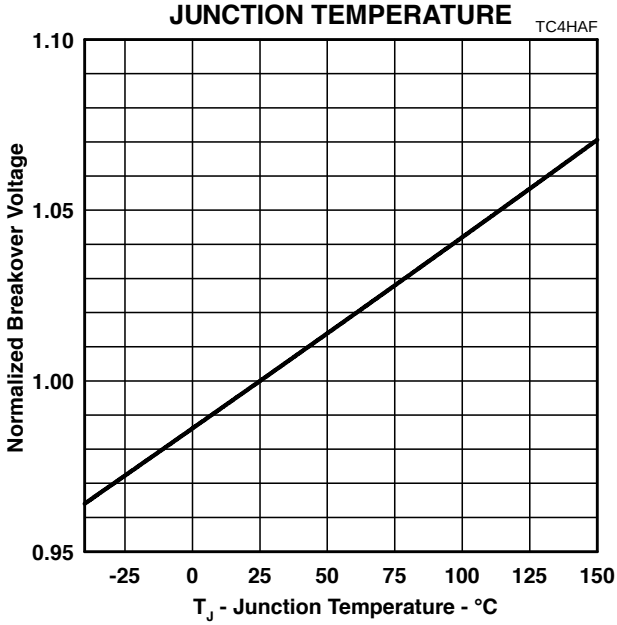


Figure 3.

ON-STATE CURRENT vs ON-STATE VOLTAGE

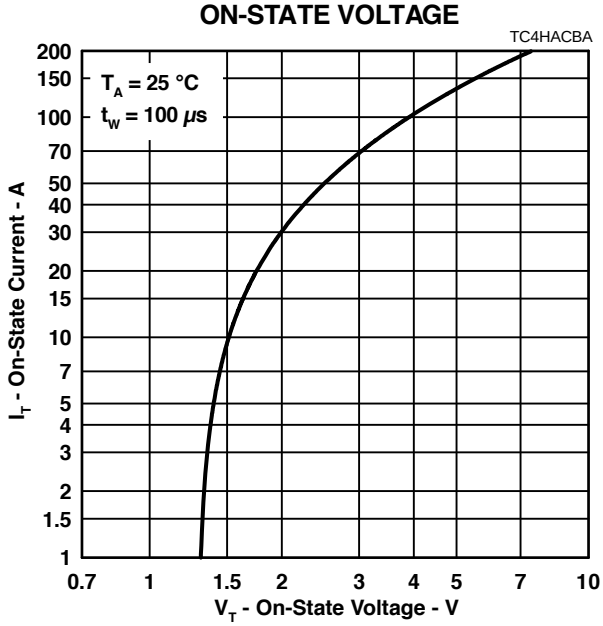


Figure 4.

NORMALIZED HOLDING CURRENT vs JUNCTION TEMPERATURE

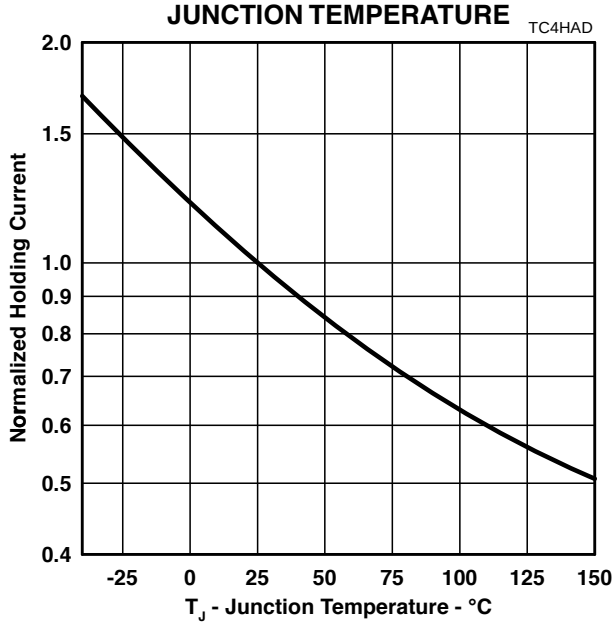


Figure 5.

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Rating and Thermal Information

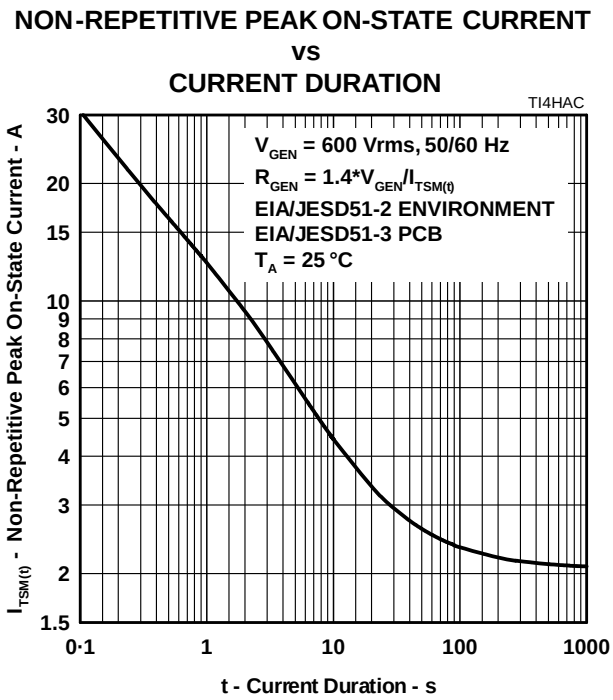


Figure 6.

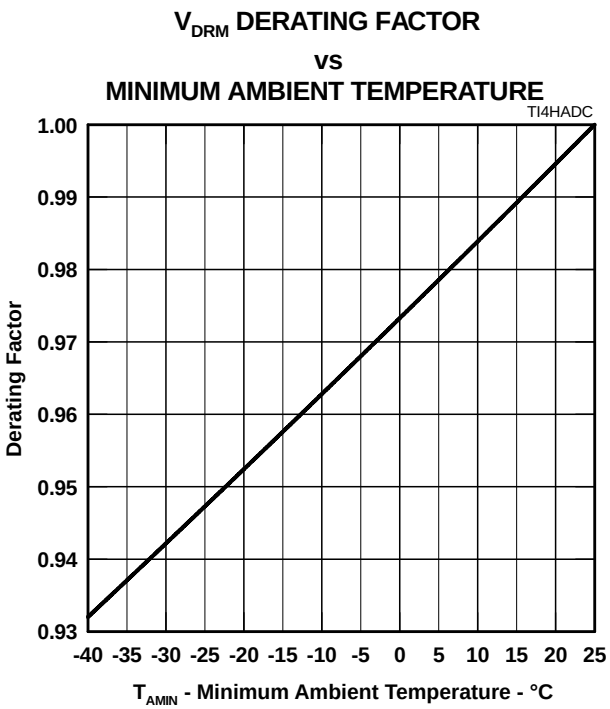


Figure 7.

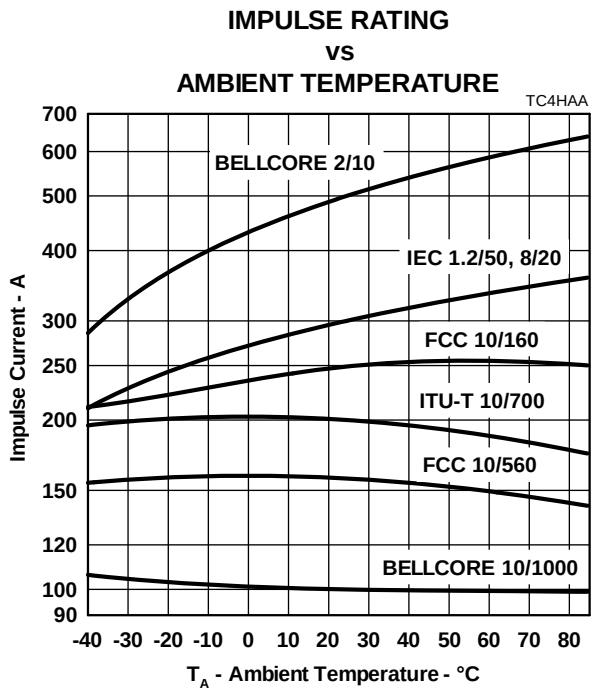


Figure 8.

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Typical Circuits

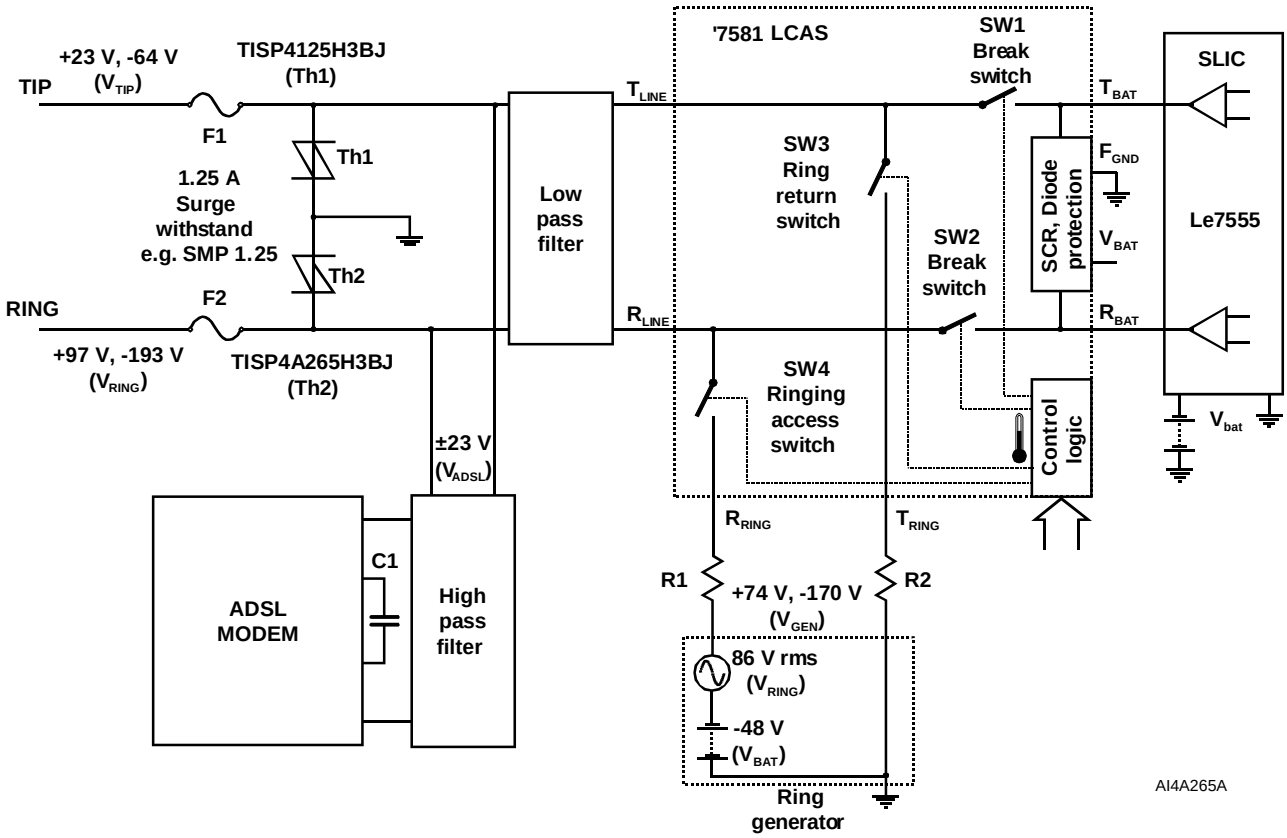


Figure 9. Integrated Voice Data (IVD) System with Typical Operating Voltage Levels Indicated

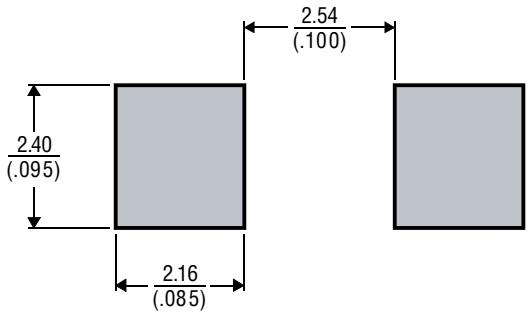
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

MECHANICAL DATA

Recommended Printing Wiring Land Pattern Dimensions

SMB Land Pattern



DIMENSIONS ARE: MILLIMETERS / (INCHES)

MDXXBID

Device Symbolization Code

Devices will be coded as below. Terminal 1 is indicated by an adjacent bar marked on the package body.

Device	Symbolization Code
TISP4A265H3BJ	4A265H

Carrier Information

For production quantities, the carrier will be embossed tape reel pack. Evaluation quantities may be shipped in bulk pack or embossed tape.

Package	Carrier	Standard Quantity
SMB	Embossed Tape Reel Pack	3000

BOURNS®

Asia-Pacific: Tel: +886-2 2562-4117 • Email: asiacus@bourns.com
EMEA: Tel: +36 88 885 877 • Email: eurocus@bourns.com
The Americas: Tel: +1-951 781-5500 • Email: americus@bourns.com
www.bourns.com

"TISP" is a trademark of Bourns, Ltd., a Bourns Company, and is Registered in the U.S. Patent and Trademark Office.
"Bourns" is a registered trademark of Bourns, Inc. in the U.S. and other countries.

JANUARY 2002 – REVISED JULY 2019

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Downloaded from Arrow.com.

Legal Disclaimer Notice

BOURNS®

This legal disclaimer applies to purchasers and users of Bourns® products manufactured by or on behalf of Bourns, Inc. and its affiliates (collectively, "Bourns").

Unless otherwise expressly indicated in writing, Bourns® products and data sheets relating thereto are subject to change without notice. Users should check for and obtain the latest relevant information and verify that such information is current and complete before placing orders for Bourns® products.

The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain "typical" applications are based on Bourns' knowledge of typical requirements in generic applications. Bourns assumes that "typical" applications include failsafe/backup features to address critical risks to users and are designed to allow rework of Bourns® product to avoid scrap of a device solely due to malfunctioning Bourns® product. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user's application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Thus, users should always verify the actual performance of the Bourns® product in their specific devices and applications and make their own independent judgments regarding the suitability of Bourns® product and the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real-world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., IATF 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification even if such industry standard or qualification is a "state of art". Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage, such as without limitation nuclear, life-critical medical and certain automotive and aviation applications. Except as set forth in the bullet points below or unless expressly and specifically approved in writing on a case-by-case basis by an authorized Bourns' representative, use of any Bourns® products in such unauthorized high-risk applications is at the user's sole risk.

- Bourns considers implantable/invasive devices and devices/procedures designed as life-supporting or life-sustaining by the U.S. Food and Drug Administration or equivalent organizations outside of the United States as "life-critical" medical applications. Bourns expressly identifies those Bourns® standard products that are suitable for use in typical medical applications that are not life-critical in its publication entitled "Bourns Medical Grade Component Guide."

- Bourns expressly identifies those Bourns® standard products that are suitable for use in typical automotive applications associated with any Automate Safety Integrity Level (ASIL) in its publication entitled "Bourns Automotive Grade Component Guide." Bourns' designation of Bourns® product as compliant with the AEC-Q standard does not by itself mean that Bourns has approved such product for use in an automotive application.

- Bourns expressly identifies Bourns® standard products that are suitable for use in the typical aviation applications/systems requiring System Design Assurance Level (RTCA DO-254 DAL) of C, D or E in its publication entitled "Bourns Civilian Aerospace/Aviation Grade Component Guide." Bourns does not test its products for compliance with United States Federal Aviation Administration standards or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aviation applications. Use of Bourns® standard components in aviation applications associated with RTCA DO-254 DAL A or B without proper approval noted above shall be at the user's sole risk.

- Bourns will review and authorize on a case-by-case basis the use of Bourns® standard products which are at least AEC-Q compliant in space-related civil applications (rockets, satellites) with a negotiated cross-waiver and indemnity agreement.

The use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

Use of Bourns® products or Bourns' technology in military/defense applications must be reviewed with Bourns for compliance with applicable export control laws and embargoes. Users shall not sell, transfer, export or re-export (which includes transfers within a country) any Bourns® products or technology or technical data for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor shall they use Bourns® products or technology or technical data in any facility which engages in activities relating to such devices. Further, Bourns® products and Bourns' technology and technical data may not under any circumstance be exported or re-exported to countries subject to international sanctions or embargoes. Bourns® products and technology may not, without prior authorization from Bourns and/or the Government of a country where such product/technology is designed and/or manufactured, be resold, transferred, or re-exported (including within the same country) to any party not eligible to receive commodities, software, and technical data originating in such country.

To the maximum extent permitted by applicable law, Bourns disclaims (i) any and all liability for special, punitive, consequential, incidental or indirect damages or lost revenues or lost profits, and (ii) any and all implied warranties (those not based on parameters specified in Bourns' data sheets and/or specifications), including implied warranties of fitness for particular purpose, non-infringement and merchantability.

For your convenience, copies of this Legal Disclaimer Notice with German, Spanish, Japanese, Traditional Chinese and Simplified Chinese bilingual versions are available at:

Web Page: https://www.bourns.com/legal/disclaimers-terms-and-policies
PDF: https://www.bourns.com/docs/Legal/disclaimer.pdf

Downloaded from Arrow.com.