DIODES, MICROWAVE, SILICON, SCHOTTKY, GENERAL PURPOSE

BASED ON TYPES BAS40 AND BAS70

ESCC Detail Specification No. 5512/020

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DOCUMENTATION CHANGE NOTICE

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1 GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics and test and inspection data for the component type variants and/or the range of components specified below. It supplements the requirements of, and shall be read in conjunction with, the ESCC Generic Specification listed under Applicable Documents.

1.2 APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:

(a) ESCC Generic Specification No. 5010
(b) MIL-STD-750, Test Methods and Procedures for Semiconductor Devices

1.3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply.

1.4 THE ESCC COMPONENT NUMBER AND COMPONENT TYPE VARIANTS

1.4.1 The ESCC Component Number

The ESCC Component Number shall be constituted as follows:

Example: 551202001

- Detail Specification Reference: 5512020
- Component Type Variant Number: 01 (as required)

1.4.2 Component Type Variants

The component type variants applicable to this specification are as follows:

Variant Number	Based on Type	Case	Terminal Material and Finish	Weight max g
01	BAS70	T1	E2	0.02
03	BAS40	T1	E2	0.02

The terminal material and finish shall be in accordance with the requirements of ESCC Basic Specification No. 23500.

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.

Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
DC Reverse Voltage Variant 01 Variant 03	V_R	 70 40	V	
DC Forward Current Variant 01 Variant 03	I_F	 70 120	mA	
Surge Forward Current Variant 01 Variant 03	I_{FSM}	 85 170	mAp-p	Note 1
Power Dissipation	P_D	250	mW	$T_{case} \leq +125°C$ Note 2
Operating Temperature Range	T_{op}	-55 to +150	°C	T_{case}
Storage Temperature Range	T_{stg}	-55 to +150	°C	
Soldering Temperature	T_{sol}	+250	°C	Note 3
Junction Temperature	T_j	+150	°C	
Thermal Resistance, Junction-to-Case	$R_{th(j-c)}$	100	°C/W	

NOTES:

1. Duration ≤ 10ms, duty cycle = 10%.
2. For T_{case} > +125°C, derate linearly to 0W at T_{case} = +150°C.
3. Duration 5 seconds maximum at a distance of not less than 0.5mm from the device body and the same termination shall not be resoldered until 3 minutes have elapsed.

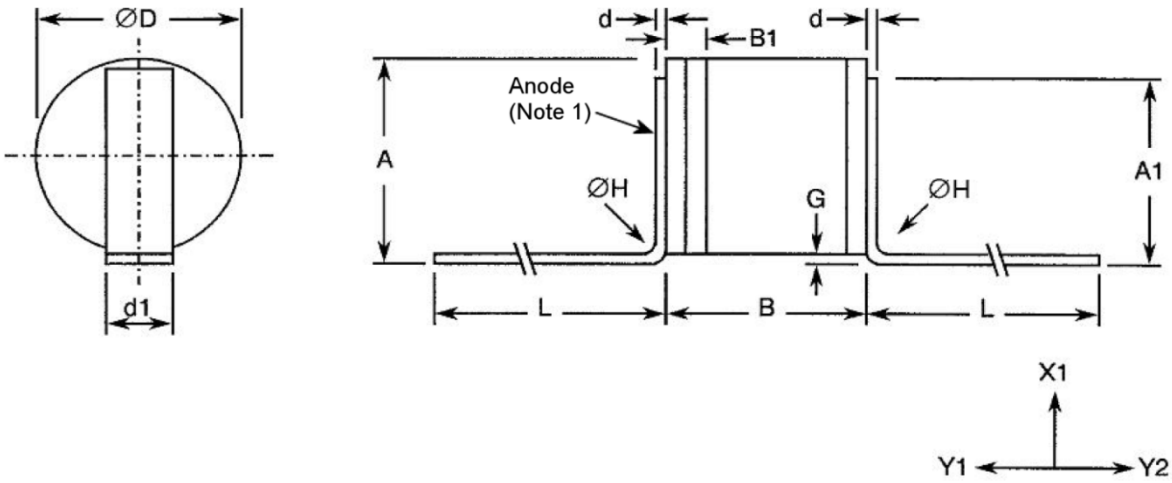
1.6 HANDLING PRECAUTIONS

These devices are susceptible to damage by electrostatic discharge. Therefore suitable precautions shall be employed for protection during all phases of manufacture test, packaging, shipping and handling.

These components are categorised as Class 1 per ESCC Basic Specification No. 23800 with a Minimum Critical Path Failure Voltage of 1000V.

1.7 PHYSICAL DIMENSIONS AND TERMINAL IDENTIFICATION

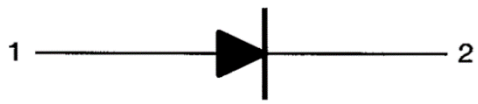
CASE TYPE T1



Symbols	Dimensions mm		Notes
	Min	Max	
A	1.4	1.95	
A1	1.05	1.25	
B	1.15	1.35	
B1	-	0.4	1
d	0.06	0.1	
d1	0.4	0.6	
ØD	1.3	1.45	
G	0.1	0.5	
ØH	-	0.3	
L	5.5	-	

NOTES:
1. The anode terminal is identified by the sealing ring and lid (dimension B1).

1.8 FUNCTIONAL DIAGRAM



1. Anode
2. Cathode

1.9 MATERIALS AND FINISHES

Materials and finishes shall be as follows:

(a) Case
The case shall be hermetically sealed, have a ceramic body and a metal sealing ring and lid.

(b) Terminals
As specified in Component Type Variants.

2 REQUIREMENTS

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

2.1.1 Deviations from the Generic Specification

2.1.1.1 Deviations from Screening Tests (Chart F3)

(a) Radiographic Inspection: shall be performed in the X and Z axes only.

2.1.1.2 Deviations from Qualification and Periodic Tests for Packaged Components (Chart F4A)

(a) Mechanical Shock: Not applicable.
(b) Vibration: Not applicable.
(c) Constant Acceleration: Not applicable.

2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700. The information to be marked and the order of precedence shall be as follows:

(a) The ESCC qualified components symbol (for ESCC qualified components only).
(b) The ESCC Component Number.
(c) Traceability information.

2.3 DIE SHEAR

In those cases where package clearances are such that a die shear test is not practicable, the die shall be pushed away with a suitable tool. The force required to remove the die need not be recorded. The die attachment area shall be inspected and the component shall be considered acceptable if more than 50% of the semiconductor material remains.

2.4 TERMINAL STRENGTH

The test conditions for terminal strength, tested as specified in the ESCC Generic Specification, shall be as follows:

- Test Condition A, tension, with a force of 1.5N and a duration of 5s.

2.5 ELECTRICAL MEASUREMENTS AT ROOM, HIGH AND LOW TEMPERATURES

2.5.1 Room Temperature Electrical Measurements

The measurements shall be performed at T_{amb} = +25 ±3°C.

Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions	Limits		Units
				Min	Max	
Reverse Current 1	I_{R1}	4016	Variant 01, V_R = 70V Variant 03, V_R = 40V	- -	2 2	µA
Reverse Current 2	I_{R2}	4016	Variant 01, V_R = 56V Variant 03, V_R = 32V	- -	100 100	nA
Forward Voltage 1	V_{F1}	4011	I_F = 1mA Variant 01 Variant 03	 300 290	 440 390	mV
Forward Voltage 2	V_{F2}	4011	I_F = 10mA Variant 01 Variant 03	 600 410	 780 540	mV
Forward Voltage 3	V_{F3}	4011	Variant 01, I_F = 15mA Variant 03, I_F = 40mA	0.8 0.65	1 0.85	V
Differential Forward Resistance (Note 1)	R_{FD}	-	I_{F1} = 10mA, I_{F2} = 15mA Variant 01 Variant 03	 26 8	 34 12	Ω
Total Capacitance	C_T	4001	V_R = 0V, f = 1MHz V_{in} = 15mV Variant 01 Variant 03	 1.2 2.4	 2 4	pF

NOTES:

1. $R_{FD} = \Delta V_F/\Delta I_F$.

2.5.2 High and Low Temperatures Electrical Measurements

The measurements shall be performed only at T_{amb} = +145 (+0 -5)°C.

Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions (Note 1)	Limits		Units
				Min	Max	
Reverse Current 2	I_{R2}	4016	Variant 01, V_R = 56V Variant 03, V_R = 32V	- -	100 200	µA
Forward Voltage 3	V_{F3}	4011	Variant 01, I_F = 15mA Variant 03, I_F = 40mA	- -	950 800	mV

NOTES:

1. Measurements shall be performed on a sample of 5 components. In the event of any failure a 100% inspection shall be performed.

2.6 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at T_{amb} = +25 ±3°C.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The drift values (Δ) shall not be exceeded for each characteristic specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Limits			Units
		Drift Value (1) Δ	Absolute		
			Min	Max	
Reverse Current 2	I_{R2}	±10 or (2) +50%, -33%	-	100	nA
Forward Voltage 3 Variant 01 Variant 03	V_{F3}	±5%	 0.8 0.65	 1 0.85	V

NOTES:

1. Δ1 = Δ2.
2. Whichever is greater.

2.7 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified, the measurements shall be performed at T_{amb} = +25 ±3°C.

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Limits		Units
		Min	Max	
Reverse Current 1	I_{R1}	-	2.2	µA
Reverse Current 2	I_{R2}	-	110	nA
Forward Voltage 1	V_{F1}			mV
Variant 01		290	450	
Variant 03		280	400	
Forward Voltage 2	V_{F2}			mV
Variant 01		580	800	
Variant 03		390	560	
Forward Voltage 3	V_{F3}			V
Variant 01		0.78	1.02	
Variant 03		0.63	0.87	
Differential Forward Resistance	R_{FD}			Ω
Variant 01		25	35	
Variant 03		7.5	12.5	
Total Capacitance	C_T			pF
Variant 01		1.1	2.1	
Variant 03		2.3	4.1	

2.8 BURN-IN 1 CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+145 (+0 -5)	°C
Reverse Voltage	V_R		V
Variant 01		56 (+0 -3)	
Variant 03		32 (+0 -2)	
		Note 1	

NOTES:

1. After the burn-in period the components shall be allowed to cool until T_{amb} = +25 ±3°C and the V_R bias shall be maintained until T_{amb} < +35°C.

2.9 BURN-IN 2 CONDITIONS

Characteristics	Symbols	Test Conditions (Note 1)	Units
Junction Temperature	T_j	+150 (+0 -5)	°C
Power Dissipation	P_D	240 ±10	mW

NOTES:

1. T_{case} shall be adjusted to attain the specified T_j.

2.10 OPERATING LIFE CONDITIONS

The conditions shall be as specified for Burn-in 2.

APPENDIX A
AGREED DEVIATIONS FOR INFINEON TECHNOLOGIES AG (D)

Items Affected	Description of Deviations
Deviations from Generic Specification: Special In-Process Controls (Chart F2)	Bond Strength: The following pre-seal bond strength shall apply: • 0.05N minimum
	Die Shear: The following shear strength shall apply: • 0.5N minimum
	Dimension Check: May be performed during Chart F3 testing.
Deviations from Generic Specification: Screening Tests (Chart F3)	Temperature Cycling: Shall be replaced by a Thermal Shock test in accordance with MIL-STD-202, Test Method 107, Test Condition B, 20 cycles.
Deviations from Generic Specification: Qualification and Periodic Tests (Chart F4)	Temperature Cycling: Shall be replaced by a Thermal Shock test in accordance with MIL-STD-202, Test Method 107, Test Condition B, 100 cycles.
	Assembly Capability Subgroup tests: In addition to the permitted use of empty packages or electrical rejects as test samples, components rejected during the following Screening Tests: • Radiographic Inspection • Seal • External Visual Inspection may be used on the condition that the cause for rejection has no possible impact on the tests, and they have been subjected to the same screening as the packages of the assembly lot with which they are associated.
	Bond Strength: The following post–seal bond strength shall apply: • 0.04N minimum
	Die Shear: The following shear strength shall apply: • 0.5N minimum
Deviations from Generic Specification: Final Customer Source Inspection	Final Customer Source Inspection shall be limited to witnessing of the DC parameters specified in Room Temperature Electrical Measurements.
Deviations from Generic Specification: Data Documentation	Additional Documentation and Wafer Lot Acceptance Data: If Wafer Lot Acceptance Data is stipulated in the Purchase Order, such data will not be delivered but will be available for review at Infineon Technologies AG.