TABLE 1(a)- Type Variants

Variant	Based on Type	Case	Figure	Breakdown Voltage V(BR) (V)	Working Peak Reverse Voltage VRWM (V)	Lead/Terminal Material and Finish
13	1N5806U	LCC2A	2(d)	150	150	2
14	1N5806U	LCC2A	2(d)	150	150	4

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 1(a)- MAXIMUM RATINGS

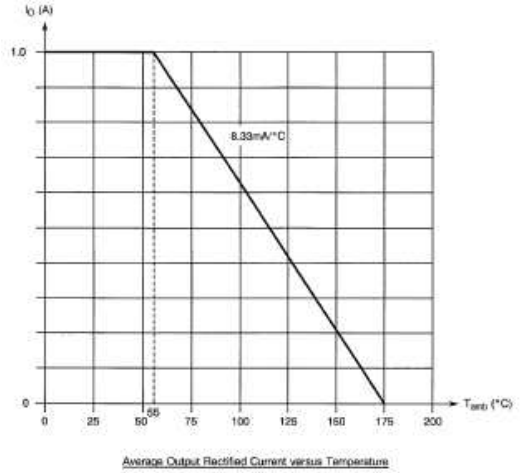
N°	Characteristics	Symbols	Maximum Ratings	Unit	Remarks
1	Forward Surge Current (per Diode) Variants 01 to 12 Variants 13 to 14	IFSM	35 33	A(pk) A	At Tamb ≤ +25°C Note 1 Note 7
3	Average Output Rectified Current Variants 01 to 12 Variants 13 to 14	IO	1 2.5	A A	50%Duty Cycle Note 3 Note 8
4	Operating Temperature Range Variants 01 to 12 Variants 13 to 14 (Case Temperature)	Top Top	-65 to +175 -65 to +175	°C °C	Tamb Note 9
added	Junction Temperature Variants 13 to 14	Tj	+175	°C	
5	Storage Temperature Range	Tstg	-65 to +175	°C	Note 9
6	Soldering Temperature Variant 01 to 09 Variant 10 to 12 Variant 13 to 14	Tsol	+245	°C	 Note 4 Note 5 Note 10
added	Thermal Resistance, Junction to Case Variant 13 to 14	Rth(j-c)	13	°C/W	Note 11

NOTES:

7. Sinusoidal pulse of 10ms duration.
8. For Variants 13 to 14 at Tcase ≥ +142°C per Diode, derate linearly to 0A at +175°C.
9. For Variants with hot solder dip lead finish all testing performed at Tamb>+125°C shall be carried out in a 100% inert atmosphere.
10. Duration 5 seconds maximum. The same package must not be resoldered until 3 minutes have elapsed.
11. Package mounted on infinite heatsink.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

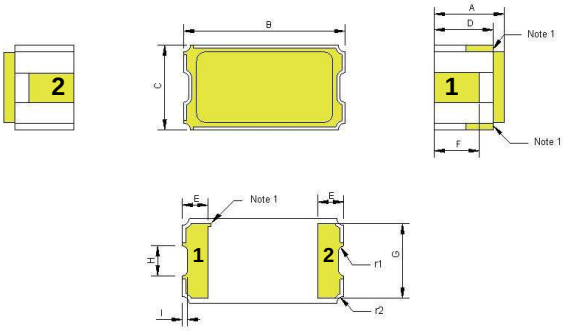
FIGURE 1 – PARAMETER DERATING INFORMATION (Not Applicable for the variants 13 to 14)



Average Output Rectified Current versus Temperature

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

Figure 2(d)- Variant 13 to 14 - Leadless Chip Carrier 2 (LCC2A) – 2 Terminal



Ref	Dimensions					
	Millimeters			Inches		
	Min	Typ	Max	Min	Typ	Max
A(2)	1.86	2.03	2.20	0.073	0.080	0.087
B	4.54	4.67	4.87	0.179	0.184	0.192
C	2.33	2.46	2.59	0.092	0.097	0.102
D	1.53	1.7	1.87	0.060	0.067	0.074
E	0.48		0.71	0.019		0.031
F	1.3			0.051		
G	2.16			0.085		
H	0.86			0.034		
I	0.15			0.006		
r1	0.15			0.006		
r2	0.20			0.008		

Notes:

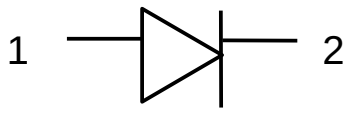
1. The anode is identified by metallization in two castellation and by the index mark on the bottom metallization n°1.
2. Measurement prior to solder coating the mounting pads on bottom of package.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

FIGURE 3 - FUNCTIONAL DIAGRAM

Variants 13 to 14

Terminal 1: Anode
Terminal 2: Cathode



Notes:
1. For LCC2, the lid is not connected to any lead.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.2.2 Deviations from Final Production Tests (Chart II)

(a) Para. 9.2.1, Bond Strenght Test: Not applicable; excepted for the variants 13 to 14 (Applicable in the Chart F2 of the ESCC N°5000 Issue 3).

(b) Para. 9.2.2, Die Shear Test: Not applicable; excepted for the variants 13 to 14 (Applicable in the Chart F2 of the ESCC N°5000 Issue 3).

(c) At any time following Para. 9.5.1, Thermal Shock Test, Thermal impedance measurements shall be performed in accordance with MIL-STD-750, TEST Method 3101 as specified in Table 2, item 9. For the variants 13 to 14 (the thermal impedance and the thermal shock applicable in the Chart F3 of the ESCC N°5000 Issue 3).

(d) Para. 9.6, Constant Acceleration: Not applicable; excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 1 of the ESCC N°5000 Issue 3).

(e) Para. 9.7 Particle Impact Noise Detection (PIND) test: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F3 of the ESCC N°5000 Issue 3).

(f) Para. 9.8.1, Seal Test Fine Leak: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F3 of the ESCC N°5000 Issue 3).

(g) ……..Excepted for the variants 13 to 14: N/A.

(h) ……..Excepted for the variants 13 to 14: N/A

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.2.3 Deviations from Burn-In and Electrical Measurements (Chart III)

(b) Para. 9.8.1 Seal Test Fine Leak: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F3 of the ESCC N°5000 Issue 3).

(c) Para. 9.12, Radiographic Inspection: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F3 of the ESCC N°5000 Issue 3).

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.2.4 Deviations from Qualification Tests (Chart IV)

(a) Para. 9.2.3, Bond Strenght Test: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 3 of the ESCC N°5000 Issue 3).

(b) Para. 9.2.4, Die Shear Test: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 3 of the ESCC N°5000 Issue 3).

(c) Para. 9.8.1, Seal Test Fine Leak: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 1 and 2 of the ESCC N°5000 Issue 3).

(d) Para. 9.15, Constant Acceleration: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 1 of the ESCC N°5000 Issue 3).

Justification .

Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

(a) Para. 9.8.1, Seal Test Fine Leak: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 1 and 2 of the ESCC N°5000 Issue 3).

(b) Para. 9.15, Constant Acceleration: Not applicable excepted for the variants 13 to 14 (Applicable in the Chart F4 Subgroup 1 of the ESCC N°5000 Issue 3).

Justification .

Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.3.2 Weight

The maximum weight of the diodes specified herein shall be 0.25 grammes for the variants 01 to 06, 0.4 grammes for variant 07 to 09, 0.3 grammes for variant 10 to 12 and 0.12 grammes for the variants 13 to 14.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.3.3 Terminal Strength

For the variants 13 to 14: MIL-STD-883 test method 2004 Cond D (Applicable in the Chart F4 Subgroup 3 of the ESCC N°5000 Issue 3).

4.4.1 Case

The case shall be hermetically sealed and have an Aln body with kovar lid for the variants 13 to 14.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.4.2 Lead Material and Finish

For the variants 13 to 14 leads/terminals as specified in the Table 1a.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.5.1 General

For the variants 13 to 14 the marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

The information to be marked on the component shall be:

(a) The ESCC qualified components symbol (for ESCC qualified components only).

(b) The ESCC Component Number.

(c) Traceability information.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.6.2 Electrical Measurements at high an Low Temperatures

The parameters to be measured at high and low temperatures are scheduled in Table 3(a) and 3(b).
For the variants 01 to 12, the measured shall be performed at Tamb = +100 (+0-5) and tamb = 65 (+5-0) °C respectively.
For the variants 13 to 14, the measured shall be performed at Tamb = +125 (+0-5) and tamb = -65 (+5-0) °C respectively.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.6.3 Circuits for Electrical Measurements

For the variants 13 to 14: Not Applicable.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

4.7.3 Conditions for Power Burn-in

The requirements for power burn-in are specified in Section 7 of ESA/SCC Generic Specification No. 5000.

For the variants 01 to 12 the conditions for power burn-in are specified in Table 5(b) of this specification.

For the variants 13 to 14 the conditions for power burn-in are specified in Table 5(c) of this specification.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE
D.C.PARAMETERS

N°	Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions	Limits			Units
					Min	Typ	Max	
1	Forward Voltage	V_{F1}	4011	Pulse Method I_F=1A, Variants 01 to 12 (Note 1)	-	-	0.875	V
				Pulse Method I_F=1A, Variants 13 to 14 **(Note 4)**	-	-	0.880	V
2	Forward Voltage	V_{F2}	4011	Pulse Method I_F=2.5A, Variants 01 to 12 (Note 1)	-	-	0.975	V
				Pulse Method I_F=2.5A, Variants 13 to 14 **(Note 4)**	-	-	1	V
3	Reverse Current	I_{R1}	4016	DC Method Variant 01 to 12 $V_R=V_{RWM}$=(Note 2)	-	-	1	µA
				DC Method Variants13 to 14 $V_R=V_{RWM}$=150V	-	-	1	µA
4	Breakdown Voltage	$V_{(BR)}$	4021	I_R=-100µA Variants 01 to 12	Note 3	-	-	V
				I_R=-100µA Variants 13 to 14	150	-	-	V

Notes

1. Pulse measurement: tp = 8.3ms maximum.
2. See Column 6 of (Table1 (a)Pulse test: tp ≤ 680µs; Duty Cycle ≤ 2%
3. See Column 6 of (Table1 (a)
4. Pulse Width ≤ 680µs; Duty Cycle ≤ 2%

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE - A.C. PARAMETERS

N°	Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions	Limits			Units
					Min	Typ	Max	
5	Junction Capacitance	C_J	4001	Variant 01 to 12 V_R=10Vdc; f=1MHz Vsig=50mV(p-p)max (Note 1)	-	-	25	pF
				Variant 13 to 14 V_R=10Vdc; f=1MHz Vsig=50mV(p-p)max **(Note 4)**	-	-	25	pF
6	Reverse Recovery Time	Trr1	4031 Cond. 'A'	Variants 01 to 12 I_F=I_R=0.5A; I_{RR}=50mA(pk) DI/dt=-65A/µS (Note 1)	-	-	25	nS
		Trr2	4031 Cond. 'A'	Variants 13 to 14 I_F = 1A; V_R =30V DI/dt=-50A/µS **(Note 4)**	-	-	30	nS
7	Forward Recovery Time	T_{FR}	4026	Variants 01 to 12 I_F = 250mA(pk) tr=8.0ns (Note 1 and 2)	-	-	15	nS
				Variants 13 to 14 I_{FM} = 250mA, V_{RF} = 1.1 x V_F **(Note 4)**	-	-	15	nS
8	Forward Recovery Voltage	V_{FR}	4026	Variants 01 to 12 I_{FM} = 250mA(pk) tr=8.0ns (Note 1 and 2)	-	-	2.2	V
				Variants 13 to 14 I_{FM} = 250mA **(Note 4)**	-	-	2.2	V

9	Thermal Impedance	$Z_{TH(J-C)}$	3101	Variants 01 to 12 I_H=5A; t_H=10ms I_M=1mA to 10mA t_{md}=100µs (Note 3)			4.5	°C/W
added	Thermal Impedance	$Z_{TH(J-C)}$	3101	Variants 13 to 14 I_H=1 to 10A; t_H=50ms I_M=50mA; t_{md}=100µs **(Note 5)**	Calculate ΔVF, **(see Note 6)**			°C/W

NOTES

1. Measurements shall be performed on a sample basic, LTPD = 7 or lower.

2. Forward Recovery Time (tfr) shall be measured as the interval between zero time and the point where the pulse has decreased to 110% of the steady value of VF when IF=250mA. The maximum rise time of the response detector shall be 1.0ns. The maximum Forward Recovery Voltage (Vfr) shall be measured during the forward recovery interval.

3. During Chart II only.

4. See appendix B [Agreed Deviations for STMicroelectronics (F)]

5. Performed only during Screening Tests after reliability test, go-no-go.

6. The limits for ΔVF shall be defined by the Manufacturer on every lot in accordance with MIL-STD-750 Method 3101 and shall guarantee the Rth(j-c) limits specified in Maximum Ratings, go no go.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 3(a) - ELECTRICAL MEASUREMENTS AT HIGH TEMPERATURES

N°	Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions	Limits			Units
					Min	Typ	Max	
1	Forward Voltage	V_{F1}	4011	Pulse Method I_F=1A, Note 1 Variants 01 to12 **Tamb= +100°C**	-	-	0.8	V
				Variants 13 to 14 **(Note 3 & 4)** **Tamb=+125°C**	-	-	0.8	V
3	Reverse Current	I_{R1}	4016	Variant 01 to 12 DC Method V_R=V_{RWM}=Note2 Tamb=+100°C	-	-	50	µA
				Variant 13 to 14 **(Note 4)** DC Method V_R=V_{RWM}=150V **Tamb=+125°C**	-	-	20	µA

NOTES

1. Pulsed measurement: tp=8.3ms maximum.
2. See column 6 of Table 1(a)
3. Pulse Width≤ 680µs; Duty Cycle ≤ 2%
4. Read and record measurements shall be performed on a sample of 5 components with 0 failures allowed. Alternatively a 100% inspection may be performed.

Justification .

Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 3(b) - ELECTRICAL MEASUREMENTS AT LOW TEMPERATURES

N°	Characteristics	Symbols	MIL-STD-750 Test Method	Test Conditions	Limits			Units
					Min	Typ	Max	
1	Forward Voltage	V_{F1}	4011	Pulse Method I_F=1A, Tamb=-65°C Variants 01 to 12 (Note 1)	-	-	1.075	V
				Pulse Method I_F=1A, Tamb=-65°C Variants 13 to 14 **(Note 3 & 4)**	-	-	1.075	V
4	Breakdown Voltage	$V_{(BR)}$	4021	I_R=-100µA Tamb=-65°C Variants 01 to 12	Note 3	-	-	V
				I_R=-100µA Tamb=-65°C Variant 13 to 14 **(Note 4)**	150	-	-	V

NOTES

1. Pulsed measurement: tp=8.3ms maximum.
2. See column 6 of Table 1(a)
3. Pulse Width≤ 680µs; Duty Cycle ≤ 2%
4. Read and record measurements shall be performed on a sample of 5 components with 0 failures allowed. Alternatively a 100% inspection may be performed.

FIGURE 4 – CIRCUITS FOR ELECTRICAL MEASUREMENTS (Not Applicable for the variants 13 to 14)

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 5(a) CONDITION FOR HIGH TEMPERATURE REVERSE BIAS BURN-IN

N°	Characteristics	Symbols	Conditions	Units
3	Duration			
	Variants 01 to 12	t	72	Hours
	Variants 13 to 14	t	≥48	Hours

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package

TABLE 5(c) - CONDITIONS FOR POWER BURN-IN AND OPERATING LIFE TESTS

For the variants 13 to 14

N°	Characteristics	Symbols	Test Conditions	Units
1	Ambient Temperature	Tamb	+22 (+/-3)	°C
2	Junction Temperature	Tj	+175 (+0 -5)	°C
3	Average Output Rectified Current	IO	**Note 2**	A

NOTES:

2. The output current may be adjusted, within their given limit ranges, to attain the specified junction temperature.

Justification .

Variant 13: new ST variant introduction with LCC2A package

Variant 14: new ST variant introduction with LCC2A package

TABLE 6 - ELECTRICAL MEASUREMENTS AT INTERMEDIATE POINTS AND ONCOMPLETION OF ENDURANCE TESTING

No.	CHARACTERISTICS	SYMBOL	SPEC. AND/OR TEST METHOD	TEST CONDITIONS (Note1 and 2)	CHANGE LIMITS (Δ)	ABSOLUTE		UNIT
						MIN.	MAX.	
1	Forward Voltage Drop 1	V_{F1}	As per Table 2	As per Table 2 Variant 01 to 12 Variant 13 to 14	+/- 50mV -	- -	0.875 0.880	V V
2	Reverse Current	I_R	As per Table 2	As per Table 2 Variant 01 to 12 Variant 13 to 14	+/- 150nA -	- -	1.0	µA

NOTES

2. Changes limits is not applicable for the variants 13 to 14.

Justification .

Variant 13: new ST variant introduction with LCC2A package

Variant 14: new ST variant introduction with LCC2A package

APPENDIX 'B'

AGREED DEVIATIONS FOR STMICROELECTRONICS (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
Deviations from Production Control-Chart F2	Internal Visual Inspection: Wedge bonds equal to 1.1 wire diameter are acceptable for bonding with a V-Groove tool.
Deviations from Production Control-Chart F2	Special In-process Control Internal Visual Inspection. For CCP packages the criteria specified for voids in the filet and minimum die mounting material around the visible die perimeter for die mounting defects may be omitted providing that a radiographic inspection to verify the die-attach process is performed on a sample basis in accordance with STMicroelectronics procedure 7050651.
Deviations from Room Temperature Electrical Measurements	All AC characteristic (Electrical Measurements at Room Temperature Note 4), may be considered guaranteed but not tested if successful pilot lot testing has been performed on the diffusion lot which includes AC characteristic measurements per the Detail Specification. A summary of the pilot lot testing shall be provided if required by the Purchase Order.

Justification .
Variant 13: new ST variant introduction with LCC2A package
Variant 14: new ST variant introduction with LCC2A package