DATE: *February 2021*	**QUALIFICATION REPORT** **In accordance with PD2-03:** **GENERAL PRINCIPLES OF QUALIFICATION**	**PAGE: 1/3**

Product:

EV12AQ60xA - Quad 12bit 1.6Gsps

Qualification status: ☒ ***Accepted*** ☐ ***Pending*** ☐ ***Rejected***

This product has met all Teledyne e2v Grenoble qualification requirements.

Item	*Qualified products*	Package	Temperature range	Screening level
1	EV12AQ600ACSH	CBCGA 323	Tc 0°C, Tj +90°C	Standard
2	EV12AQ605ACSH	CBCGA 323	Tc 0°C, Tj +90°C	Standard
3	EV12AQ600AVSH	CBCGA 323	Tc -40°C, Tj +110°C	Standard
4	EV12AQ605AVSH	CBCGA 323	Tc -40°C, Tj +110°C	Standard
5	EV12AQ600AMSH	CBCGA 323	Tc -55°C, Tj +125°C	Standard
6	EV12AQ600AMGH	CBCGA 323	Tc -55°C, Tj +125°C	Standard
7	EV12AQ600AMGH9NB1	CBCGA 323	Tc -55°C, Tj +125°C	ESCC 9000
8	EV12AQ600AMGH-Y	CBCGA 323	Tc -55°C, Tj +125°C	MIL-PRF-38535

Die information:

Die size:	P. dissipated in Watt:	Mask:
6.21 mm x 8.27 mm (51.35 mm²)	**6.65 W typical in reduced swing**	**VO03A**
Wafer fab:	Process:	Technology:
ST Microelectronics (France)	**ST BICMOS9**	**130 nm**

Package information:

Outline:	Pitch:	Solder ball composition:
16 x 16 mm	**0.8 mm**	**SAC305 / 90Pb 10Sn**
Assy plant:	Moisture sensitivity level:	Max. peak reflow:
e2v (Grenoble)	**MSL3**	**245°C**

Qualification batch information :

Mask :	Diffusion lot :	Assy lot ID :	Date Code :	Item
VO03A	J710JSG	990007182	1844	Covered by Item 1, 2, 3, 4, 5, 6
		660361973	1923	Covered by item 1, 2, 3, 4, 5, 6
		660361973	1931	Covered by item 7, 8

Authorized Signature: **Carine NIKITINE** ***HRS Quality Officer*** **February 22th, *2021***

Tests for Standard Qualification:

TEST ***Acceptable criteria***	**METHOD** ***Condition***	**Sample**	**Fail**	**Status**
Construction analysis *ST BICMOS9 specifications*	MIL-STD-883 TM2010.14 ESA/SCC Basic Specification N° 21400	3 dice	0	***Pass***
ESD HBM *ATE program*	JS-001 *3 devices ok: 1000V & 3 devices ok : 2000V*	6	0	***Pass***
ESD CDM *ATE program*	JS-001 *3 devices ok: 250V & 3 devices ok : 500V*	6	0	***Pass***
LATCH UP *ATE program*	JS-002 *Class I*	4	0	***Pass***
Operating Life Test *ATE program*	JESD22-A108 *500 Hrs / Tj 140°C* *1000 Hrs / Tj 140°C* *2000 Hrs / Tj 140°C*	22	0	***Pass***
Mechanical tests External Visual Inspection Electrical test Pre-conditioning MSL3 External Visual Inspection Electrical test Deballing Electrical test Mechanical shock External Visual Inspection Vibration External Visual Inspection Electrical test	 MIL-STD-883 TM 2009 ATE program JSTD020 *Temperature humidity 30°C 60%RH, 192Hrs* MIL-STD-883 TM 2009 ATE program ATE program MIL-STD-883 TM 2002.5 cond B. ***5****x(6 axis : pulse duration 0.5 ms/1500 g)* MIL-STD-883 TM2009 MIL-STD-883 TM 2007.3 cond A ***4****x(3 axis: 20 to 2000 Htz/20 G/4 min mini)* MIL-STD-883 TM 2009 ATE program	22	0	***Pass***
UHAST External Visual Inspection Electrical test Pre-conditioning MSL3 External Visual Inspection Electrical test UHAST External Visual Inspection Electrical test	 MIL-STD-883 TM 2009 ATE program JSTD020 *Temperature humidity 30°C 60%RH, 192Hrs* MIL-STD-883 TM 2009 ATE program JESD22-A118 cond. A *130°C/85% RH, 96Hrs* MIL-STD-883 TM2009 ATE program	22	0	***Pass***
THB External Visual Inspection Electrical test Pre-conditioning MSL3 External Visual Inspection Electrical test THB	 MIL-STD-883 TM 2009 ATE program JSTD020 *Temperature humidity 30°C 60%RH, 192Hrs* MIL-STD-883 TM 2009 ATE program JESD22-A101 cond. A	22	0	***Pass***

	85°C/85% RH, 1000Hrs			
External Visual Inspection	MIL-STD-883 TM2009			
Electrical test	ATE program			
Temperature Cycling				
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
Pre-conditioning MSL3	JSTD020			
	Temperature humidity 30°C 60%RH, 192Hrs	22	0	***Pass***
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
TC	MIL-STD-883 TM1010			
	-55°C/+125°C, 1800 cycles			
External Visual Inspection	MIL-STD-883 TM2009			
Electrical test	ATE program			

Additional qualifications have been made for new substrate (article number 107834) :

TEST ***Acceptable criteria***	**METHOD** ***Condition***	**Sample**	**Fail**	**Status**
Mechanical tests				
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
Pre-conditioning MSL3	JSTD020			
	Temperature humidity 30°C 60%RH, 192Hrs			
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
Deballing		22	0	***Pass***
Electrical test	ATE program			
Mechanical shock	MIL-STD-883 TM 2002.5 cond B.			
	5*x(6 axis : pulse duration 0.5 ms/1500 g)*			
External Visual Inspection	MIL-STD-883 TM2009			
Vibration	MIL-STD-883 TM 2007.3 cond A			
	4*x(3 axis: 20 to 2000 Htz/20 G/4 min mini)*			
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
Temperature Cycling				
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
Pre-conditioning MSL3	JSTD020			
	Temperature humidity 30°C 60%RH, 192Hrs			
External Visual Inspection	MIL-STD-883 TM 2009	22	0	***Pass***
Electrical test	ATE program			
TC	MIL-STD-883 TM1010			
	-55°C/+125°C, 500 cycles			
External Visual Inspection	MIL-STD-883 TM2009			
Electrical test	ATE program			

Tests for Spatial Qualification:

TEST ***Acceptable criteria***	**METHOD** ***Condition***	**Sample**	**Fail**	**Status**
Operating Life Test *ATE program*	JESD22-A108 *500 Hrs / Tj 140°C* *1000 Hrs / Tj 140°C* *2000 Hrs / Tj 140°C*	22	0	***Pass***
Physical Dimension	MIL-STD-883 TM 2016	15	0	***Pass***
Solderability Solderability Ball shear test	MIL-STD-883 TM 2003 *solder temperature +245°C +-5°C* JESD22-B117 *45 balls from 2 devices*	3 2	0	***Pass***
Environmental tests External Visual Inspection Electrical test Pre-conditioning MSL3 External Visual Inspection Electrical test Thermal shock Temperature cycling Unbiased HAST External Visual Inspection Electrical test	 MIL-STD-883 TM 2009 ATE program JSTD020 *Temperature humidity 30°C 60%RH, 192Hrs* MIL-STD-883 TM 2009 ATE program MIL-STD-883 TM 1011 cond. B *(15 cycles -55°C/+125°C)* MIL-STD-883 TM 1010 cond. C *(100 cycles -65°C/+150°C)* JESD22 A118, cond. A *(130°C, 85% RH, 96h)* MIL-STD-883 TM 2009 ATE program	16	0	***Pass***
Mechanical tests External Visual Inspection Simulation of ball attach Electrical test Pre-conditioning MSL3 External Visual Inspection Electrical test Electrical test Mechanical shock External Visual Inspection Vibration External Visual Inspection Electrical test	 MIL-STD-883 TM 2009 ATE program JSTD020 *Temperature humidity 30°C 60%RH, 192Hrs* MIL-STD-883 TM 2009 ATE program ATE program MIL-STD-883 TM 2002.5 cond B. ***5****x(6 axis : pulse duration 0.5 ms/1500 g)* MIL-STD-883 TM2009 MIL-STD-883 TM 2007.3 cond A ***4****x(3 axis: 20 to 2000 Htz/20 G/4 min mini)* MIL-STD-883 TM 2009 ATE program	18	0	***Pass***
Salt Atmosphere External Visual Inspection Salt atmosphere External Visual Inspection	 MIL-STD-883 TM 2010 TM 1009 cond. A (24h) MIL-STD-883 TM 2010	15	0	***Pass***
Temperature Cycling External Visual Inspection Electrical test	 MIL-STD-883 TM 2009 ATE program	22	0	***Pass***

CSAM T0	MIL-STD-883 TM 2030			
Pre-conditioning MSL3	JSTD020 *Temperature humidity 30°C 60%RH, 192h, 3x reflow 235°C peak temperature*			
External Visual Inspection	MIL-STD-883 TM 2009			
Electrical test	ATE program			
CSAM T1	MIL-STD-883 TM 2030			
TC	MIL-STD-883 TM1010 *-55°C/+125°C, 1000 cycles*			
Electrical test	ATE program			
TC	MIL-STD-883 TM1010 *-55°C/+125°C, 400 cycles*			
Electrical test	ATE program			
TC	MIL-STD-883 TM1010 *-55°C/+125°C, 400 cycles*			
Electrical test	ATE program			
External Visual Inspection	MIL-STD-883 TM2009			
Electrical test	ATE program			