Qualification Test Report

2024-Jan-24

EiceDRIVER 1EDR314xHQ1

Test vehicles:	Electrical & mechanical representative type: Electrical representative type:	1EDR3147HQE 1EDR3140HQE 1EDR3144HQE 1EDR3146HQE
Scope of qualification:	1EDR3140HQE 1EDR3144HQE 1EDR3146HQE 1EDR3147HQE	
Assessment of Q-Results:	**PASS**	

Compliance to qualification standards		**AEC-Q100 and AEC Q006**

Product (Sales Description)				**1EDR3147HQE**	**1EDR3147HQE**	**1EDR3147HQE**
Preconditioning **JESD22-A113 /appropriate MSL level per J-STD-020**	**see respective rel test**	**Prior THB/HAST, AC/UHST, TC for SMD packages** **MSL2** **Reflow T = 260°C**				
ELFR **Early Life Failure Rate** AEC Q100-008	3 lots x 800 pcs Applied voltages as per HTOL	**Grade 1:** Tj = 150°C Target: 48 h	initial after	0 / 800 0 / 800 PASS	0 / 800 0 / 800 PASS	0 / 800 0 / 800 PASS
SHR JESD22-B106 for THD devices Test procedure of J-STD-020/JESD22-A113 for SMD devices	3 lots x 22 pcs	THD: solder dip at 260°C (for SnPb) for 10 sec or 270°C (for Pb free) for 7 sec SMD: 3x reflow incl. soak acc. to MSL 2	initial after	0 / 3 0 / 3 PASS	0 / 3 0 / 3 PASS	0 / 3 0 / 3 PASS
ED **Electrical Distributions** AEC Q100-009	3 lots x 30 pcs	Test at room, hot and cold temp., in this sequence	Room Cold Hot	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS
HTSL **High Temperature Storage Life** JESD22-A103	1 lot x 45 pcs	175 °C 1000h	initial 500h 1000h	0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 PASS
UHST **Unbiased HAST** JESD22-A118	3 lots x 77 pcs	264h 110°C/85% RH	initial PC 264h	0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 PASS
TC **Temperature Cycling** JESD22-A104	3 lots x 77 pcs	2000 cycles -55°C/150°C	Initial PC 1000 cyc 2000 cyc	0 / 77 0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 0 / 77 PASS
HAST (biased) **JESD22-A110** instead of THB (J) JESD22-A101	3 lots x 77 pcs	110°C, 85% RH 264h V_{ES1}: 15 V V_{ES2}: 95 V	initial PC 264 h 528 h	0 / 77 0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 0 / 77 PASS
HTOL **High Temperature Operating Life** JESD22-A108	3 lots x 77 pcs	Grade 1: T_{over} = 125 °C Tj = 150°C Target: 2000h Voltages: V_{CC1} = 15,0 V V_{CC2} = 32,0 V V_{EE2} = -8,0 V Test before and after at	Initial 500 h 1000 h 2000 h	0 / 77 0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 0 / 77 PASS	0 / 77 0 / 77 0 / 77 0 / 77 PASS
ESD HBM **Electrostatic Discharge Human Body Model** AEC Q100-002	1 lot 3 devices per voltage class Device specific test			Class 3A: 4000 V to < 8000 V	-	-
ESD CDM **Electrostatic Discharge Charged Device Model** AEC Q100-011	1 lot 3 devices per voltage class Device specific test			Class 3 TC 1500	-	-
LU (U) **Latch-Up** AEC Q100-004	1 lot x 6pcs	I_trigger = 100 mA and Ta = 125°C Class II (according AEC Q100);		PASS	-	-
WBS **Wire Bond Shear** AEC Q003 AEC Q100-001	30 bonds from minimum 5 devices		Cpk>1.67	PASS	-	-
WBP **Wire Bond Pull** AEC Q003 MIL-STD883 Method 2011	30 bonds from minimum 5 devices		Cpk>1.67	PASS	-	-
SD **Solderability** JEDEC JESD22-B102 or JEDEC J-STD-002D	1 lot x 15 samples		>95% lead coverage	PASS	-	-
PD **Physical Dimensions** JEDEC JESD22-B100 and B108 AEC Q003	3 lots x 10 samples		Cpk>1.67	PASS	PASS	PASS

Product (Sales Description)				1EDR3146HQE	1EDR3146HQE	1EDR3146HQE
ELFR **Early Life Failure Rate** AEC Q100-008	3 lots x 800 pcs Applied voltages as per HTOL	**Grade 1:** Tj = 150°C Target: 48 h	initial after	-	-	-
SHR JESD22-B106 for THD devices Test procedure of J-STD-020/JESD22-A113 for SMD devices	3 lots x 22 pcs	THD: solder dip at 260°C (for SnPb) for 10 sec or 270°C (for Pb free) for 7 sec SMD: 3x reflow incl. soak acc. to MSL 2	initial after	-	-	-
ED **Electrical Distributions** AEC Q100-009	3 lots x 30 pcs	Test at room, hot and cold temp., in this sequence	Room Cold Hot	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS
HTSL **High Temperature Storage Life** JESD22-A103	1 lot x 45 pcs	175 °C 1000h	initial 500h 1000h	-	-	-
UHST **Unbiased HAST** JESD22-A118	3 lots x 77 pcs	264h 110°C/85% RH	initial PC 264h	-	-	-
TC **Temperature Cycling** JESD22-A104	3 lots x 77 pcs	2000 cycles -55°C/150°C	Initial PC 1000 cyc 2000 cyc	-	-	-
HAST (biased) **JESD22-A110** instead of THB (J) JESD22-A101	3 lots x 77 pcs	110°C, 85% RH 264h V_{ES1}: 15 V V_{ES2}: 95 V	initial PC 264 h 528 h	-	-	-
HTOL **High Temperature Operating Life** JESD22-A108	3 lots x 77 pcs	Grade 1: T_{jmax} = 125 °C Tj = 150°C Target: 2000h Voltages: V_{CC1} = 15,0 V V_{CC2} = 32,0 V V_{EE2} = -8,0 V Test before and after at	Initial 500 h 1000 h 2000 h	-	-	-
ESD HBM **Electrostatic Discharge Human Body Model** AEC Q100-002	1 lot 3 devices per voltage class Device specific test			Class 3A: 4000 V to < 8000 V	-	-
ESD CDM **Electrostatic Discharge Charged Device Model** AEC Q100-011	1 lot 3 devices per voltage class Device specific test			Class 3 TC 1500	-	-
LU (U) **Latch-Up** AEC Q100-004	1 lot x 6pcs	I_trigger = 100 mA and Ta = 125°C Class II (according AEC Q100);		PASS	-	-
WBS **Wire Bond Shear** AEC Q003 AEC Q100-001	30 bonds from minimum 5 devices		Cpk>1.67	-	-	-
WBP **Wire Bond Pull** AEC Q003 MIL-STD883 Method 2011	30 bonds from minimum 5 devices		Cpk>1.67	-	-	-
SD **Solderability** JEDEC JESD22-B102 or JEDEC J-STD-002D	1 lot x 15 samples		>95% lead coverage	-	-	-
PD **Physical Dimensions** JEDEC JESD22-B100 and B108 AEC Q003	3 lots x 10 samples		Cpk>1.67			

Product (Sales Description)				1EDR3144HQE	1EDR3144HQE	1EDR3144HQE
ELFR **Early Life Failure Rate** AEC Q100-008	3 lots x 800 pcs Applied voltages as per HTOL	**Grade 1:** Tj = 150°C Target: 48 h	initial after	-	-	-
SHR JESD22-B106 for THD devices Test procedure of J-STD-020/JESD22-A113 for SMD devices	3 lots x 22 pcs	THD: solder dip at 260°C (for SnPb) for 10 sec or 270°C (for Pb free) for 7 sec SMD: 3x reflow incl. soak acc. to MSL 2	initial after	'-	-	-
ED **Electrical Distributions** AEC Q100-009	3 lots x 30 pcs	Test at room, hot and cold temp., in this sequence	Room Cold Hot	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS
HTSL **High Temperature Storage Life** JESD22-A103	1 lot x 45 pcs	175 °C 1000h	initial 500h 1000h	-	-	-
UHST **Unbiased HAST** JESD22-A118	3 lots x 77 pcs	264h 110°C/85% RH	initial PC 264h	-	-	-
TC **Temperature Cycling** JESD22-A104	3 lots x 77 pcs	2000 cycles -55°C/150°C	Initial PC 1000 cyc 2000 cyc	-	-	-
HAST (biased) **JESD22-A110** instead of THB (J) JESD22-A101	3 lots x 77 pcs	110°C, 85% RH 264h V_{ES1}: 15 V V_{ES2}: 95 V	initial PC 264 h 528 h	-	-	-
HTOL **High Temperature Operating Life** JESD22-A108	3 lots x 77 pcs	Grade 1: T_{jmax} = 125 °C Tj = 150°C Target: 2000h Voltages: V_{CC1} = 15,0 V V_{CC2} = 32,0 V V_{EE2} = -8,0 V Test before and after at	Initial 500 h 1000 h 2000 h	-	-	-
ESD HBM **Electrostatic Discharge Human Body Model** AEC Q100-002	1 lot 3 devices per voltage class Device specific test			Class 3A: 4000 V to < 8000 V	-	-
ESD CDM **Electrostatic Discharge Charged Device Model** AEC Q100-011	1 lot 3 devices per voltage class Device specific test			Class 3 TC 1500	-	_
LU (U) **Latch-Up** AEC Q100-004	1 lot x 6pcs	I_trigger = 100 mA and Ta = 125°C Class II (according AEC Q100);		PASS	-	-
WBS **Wire Bond Shear** AEC Q003 AEC Q100-001	30 bonds from minimum 5 devices		Cpk>1.67	-	-	-
WBP **Wire Bond Pull** AEC Q003 MIL-STD883 Method 2011	30 bonds from minimum 5 devices		Cpk>1.67	-	-	_
SD **Solderability** JEDEC JESD22-B102 or JEDEC J-STD-002D	1 lot x 15 samples		>95% lead coverage	-	-	-
PD **Physical Dimensions** JEDEC JESD22-B100 and B108 AEC Q003	3 lots x 10 samples		Cpk>1.67			

Product (Sales Description)				1EDR3140HQE	1EDR3140HQE	1EDR3140HQE
ELFR **Early Life Failure Rate** AEC Q100-008	3 lots x 800 pcs Applied voltages as per HTOL	**Grade 1:** Tj = 150°C Target: 48 h	initial after	-	-	-
SHR JESD22-B106 for THD devices Test procedure of J-STD-020/JESD22-A113 for SMD devices	3 lots x 22 pcs	THD: solder dip at 260°C (for SnPb) for 10 sec or 270°C (for Pb free) for 7 sec SMD: 3x reflow incl. soak acc. to MSL 2	initial after	-	-	-
ED **Electrical Distributions** AEC Q100-009	3 lots x 30 pcs	Test at room, hot and cold temp., in this sequence	Room Cold Hot	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS	0 / 30 0 / 30 0 / 30 PASS
HTSL **High Temperature Storage Life** JESD22-A103	1 lot x 45 pcs	175 °C 1000h	initial 500h 1000h	-	-	-
UHST **Unbiased HAST** JESD22-A118	3 lots x 77 pcs	264h 110°C/85% RH	initial PC 264h	-	-	-
TC **Temperature Cycling** JESD22-A104	3 lots x 77 pcs	2000 cycles -55°C/150°C	Initial PC 1000 cyc 2000 cyc	-	-	-
HAST (biased) **JESD22-A110** instead of THB (J) JESD22-A101	3 lots x 77 pcs	110°C, 85% RH 264h V_{ES1}: 15 V V_{ES2}: 95 V	initial PC 264 h 528 h	-	-	-
HTOL **High Temperature Operating Life** JESD22-A108	3 lots x 77 pcs	Grade 1: T_{jmax} = 125 °C Tj = 150°C Target: 2000h Voltages: V_{CC1} = 15,0 V V_{CC2} = 32,0 V V_{EE2} = -8,0 V Test before and after at	Initial 500 h 1000 h 2000 h	-	-	-
ESD HBM **Electrostatic Discharge Human Body Model** AEC Q100-002	1 lot 3 devices per voltage class Device specific test			Class 3A: 4000 V to < 8000 V	-	-
ESD CDM **Electrostatic Discharge Charged Device Model** AEC Q100-011	1 lot 3 devices per voltage class Device specific test			Class 3 TC 1500	-	-
LU (U) **Latch-Up** AEC Q100-004	1 lot x 6pcs	I_trigger = 100 mA and Ta = 125°C Class II (according AEC Q100);		PASS	-	-
WBS **Wire Bond Shear** AEC Q003 AEC Q100-001	30 bonds from minimum 5 devices		Cpk>1.67	-	-	-
WBP **Wire Bond Pull** AEC Q003 MIL-STD883 Method 2011	30 bonds from minimum 5 devices		Cpk>1.67	-	-	-
SD **Solderability** JEDEC JESD22-B102 or JEDEC J-STD-002D	1 lot x 15 samples		>95% lead coverage	-	-	-
PD **Physical Dimensions** JEDEC JESD22-B100 and B108 AEC Q003	3 lots x 10 samples		Cpk>1.67			