



Final Product/Process Change Notification

Document #:FPCN25572X36

Issue Date:08 Aug 2024

Title of Change:	Update to FPCN25572X - To include the reliability data for SOIC20W package parts for the Qualification of Vanguard Fab and Assembly related changes for Logic Parts (LCX244, LVX, VHC & VHCT devices only).
Proposed First Ship date:	15 Nov 2024 or earlier if approved by customer
Contact Information:	Contact your local onsemi Sales Office or logic.fpcn@onsemi.com
PCN Samples Contact:	Contact your local onsemi Sales Office. Sample requests are to be submitted no later than 30 days from the date of first notification, Initial PCN or Final PCN, for this change. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.
Additional Reliability Data:	Contact your local onsemi Sales Office or ChangKit.Mok@onsemi.com
Type of Notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. FPCNs are issued 90 days prior to implementation of the change. onsemi will consider this change accepted, unless an inquiry is made in writing within 30 days of delivery of this notice. To do so, contact PCN.Support@onsemi.com
Marking of Parts/ Traceability of Change:	Custom source on label will show TW instead of US/IL to indicate new die source from Vanguard. Changed material may be identified by plant code or lot code too.
Change Category:	Assembly Change, Wafer Fab Change
Change Sub-Category(s):	Manufacturing Site Addition, Shipping/Packaging/Marking, Datasheet/Product Doc change, Material Change

Sites Affected:

onsemi Sites	External Foundry/Subcon Sites
onsemi Carmona, Philippines	Greatek Electronics Inc., Taiwan
	Vanguard International Semiconductor, Taiwan

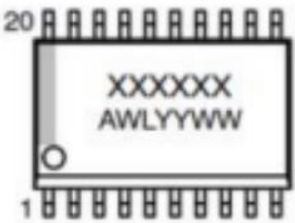
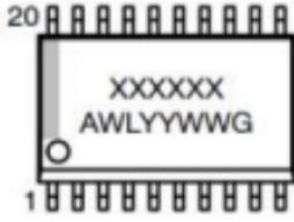
Description and Purpose:

With reference to **FPCN25572X**, this FPCN presents the information solely for SOIC20W the pertinent reliability data.

	From	To
Fab Site	Tower Semiconductor	Vanguard International
Wafer Size	150 mm	200mm

	From	To	
Assembly Site	onsemi Carmona	onsemi Carmona	Greatek
Leadframe Flagsize (mm)	3.048 x 3.810 2.286 x 2.286 2.794 x 3.556 1.372 x 1.930 2.794 x 2.794	1.372 x 1.930	2.794 x 3.556
Die Attach	CRM-1076WB	CRM-1076WB	EN-4900GC
Bond Wire	0.8 mil Au	1 mil PCC	1 mil PCC
Mold Compound	G600	G600	G600F

Marking Changes for 74LCX244WMX, 74LCX244WM and 74VHCT541AMX:

	From	To
Marking Changes	 XXXXXX = Specific Device Code A = Assembly Location WL = Wafer Lot Number YY = Year WW = Work Week	 XXXXXX = Specific Device Code A = Assembly Location WL = Wafer Lot YY = Year of Production WW = Work Week Number ■ or G = Pb-Free Indicator (Note: Microdot may be in either location)

Reliability Data Summary:

QV DEVICE NAME : MC74HC244ADWR2G

RMS : O89402

PACKAGE : SOIC 20W

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	0/231
High Temperature Storage Life	JESD22-A103	Ta=150°C	1008 hrs	0/231
Preconditioning	J-STD-020 JESD-A113	MSL 3 @260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	0/693
Temperature Cycling	JESD22-A104	Ta= -65°C to +150°C	500 cyc	0/231
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hrs	0/231
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	0/231
Resistance to Solder Heat	JESD22- B106	Ta = 265°C, 10 sec	-	0/30



Final Product/Process Change Notification

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QV DEVICE NAME : NLV74HC244ADWR2G

RMS : O89396

PACKAGE : SOIC 20W

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	0/231
High Temperature Storage Life	JESD22-A103	Ta=150°C	1008 hrs	0/231
Preconditioning	J-STD-020 JESD-A113	MSL 3 @260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	0/693
Temperature Cycling	JESD22-A104	Ta= -65°C to +150°C	500 cyc	0/231
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hrs	0/231
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	0/231
Resistance to Solder Heat	JESD22- B106	Ta = 265°C, 10 sec	-	0/30

Electrical Characteristics Summary:

MC74VHCxxx – Maximum Ratings

Existing

MAXIMUM RATINGS (Note 1)					
Symbol	Parameter		Value	Unit	
V _{CC}	Positive DC Supply Voltage		-0.5 to +7.0	V	
V _{IN}	Digital Input Voltage		-0.5 to +7.0	V	
V _{OUT}	DC Output Voltage		-0.5 to V _{CC} +0.5	V	
I _{IK}	Input Diode Current		-20	mA	
I _{OK}	Output Diode Current		±20	mA	
I _{OUT}	DC Output Current, per Pin		±25	mA	
I _{CC}	DC Supply Current, V _{CC} and GND Pins		±75	mA	
P _D	Power Dissipation in Still Air	SOIC TSSOP	500 450	mW	
T _{STG}	Storage Temperature Range		-65 to +150	°C	
V _{ESD}	ESD Withstand Voltage	Human Body Model (Note 2) Machine Model (Note 3) Charged Device Model (Note 4)	>2000 >200 >2000	V	
t _{LATCHUP}	Latchup Performance	Above V _{CC} and Below GND at 125°C (Note 5)	±300	mA	
θ _{JA}	Thermal Resistance, Junction-to-Ambient		SOIC TSSOP	96 128	°C/W

New

MAXIMUM RATINGS			
Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	-0.5 to +6.5	V
V_{IN}	DC Input Voltage	-0.5 to +6.5	V
V_{OUT}	DC Output Voltage (MC74VHC)	-0.5 to $V_{CC}+0.5$	V
	DC Output Voltage (MC74VHCT)	Active Mode (High or Low State) Tristate Mode (Note 1) Power-Off Mode ($V_{CC} = 0$ V) -0.5 to $V_{CC}+0.5$ -0.5 to +6.5 -0.5 to +6.5	
I_{IN}	DC Input Current, per Pin	±20	mA
I_{OUT}	DC Output Current, Per Pin	±25	mA
I_{CC}	DC Supply Current, V_{CC} and GND Pins	±75	mA
I_{IK}	Input Clamp Current	-20	mA
I_{OK}	Output Clamp Current	MC74VHC244 MC74VHCT244A ±20 -20	mA
T_{STG}	Storage Temperature Range	-65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 secs	260	°C
T_J	Junction Temperature Under Bias	+150	°C
θ_{JA}	Thermal Resistance (Note 2)	SOIC-20W TSSOP-20 96 150	°C/W
P_D	Power Dissipation in Still Air at 25°C	SOIC-20W TSSOP-20 1302 833	mW
MSL	Moisture Sensitivity	Level 1	-
F_R	Flammability Rating	Oxygen Index: 28 to 34 UL 94 V-0 @ 0.244 in	-
V_{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model 2000 N/A	V
$t_{LATCHUP}$	Latchup Performance (Note 4)	±100	mA

MC74VHCTxxx – Maximum Ratings

Existing

MAXIMUM RATINGS			
Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	-0.5 to +7.0	V
V_{IN}	DC Input Voltage	-0.5 to +7.0	V
V_{OUT}	DC Output Voltage	Output in 3-State High or Low State -0.5 to +7.0 -0.5 to $V_{CC} + 0.5$	V
I_{IK}	Input Diode Current	-20	mA
I_{OK}	Output Diode Current ($V_{OUT} < GND$; $V_{OUT} > V_{CC}$)	±20	mA
I_{OUT}	DC Output Current, per Pin	±25	mA
I_{CC}	DC Supply Current, V_{CC} and GND Pins	±75	mA
P_D	Power Dissipation in Still Air	SOIC Packages† TSSOP Package† 500 450	mW
T_{STG}	Storage Temperature	-65 to +150	°C

New

MAXIMUM RATINGS			
Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	-0.5 to +6.5	V
V_{IN}	DC Input Voltage	-0.5 to +6.5	V
V_{OUT}	DC Output Voltage (MC74VHC)	-0.5 to $V_{CC}+0.5$	V
	DC Output Voltage (MC74VHCT)	Active Mode (High or Low State) Tristate Mode (Note 1) Power-Off Mode ($V_{CC} = 0$ V) -0.5 to $V_{CC}+0.5$ -0.5 to +6.5 -0.5 to +6.5	
I_{IN}	DC Input Current, per Pin	±20	mA
I_{OUT}	DC Output Current, Per Pin	±25	mA
I_{CC}	DC Supply Current, V_{CC} and GND Pins	±75	mA
I_{IK}	Input Clamp Current	-20	mA
I_{OK}	Output Clamp Current	MC74VHC244 MC74VHCT244A ±20 -20	mA
T_{STG}	Storage Temperature Range	-65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 secs	260	°C
T_J	Junction Temperature Under Bias	+150	°C
θ_{JA}	Thermal Resistance (Note 2)	SOIC-20W TSSOP-20 96 150	°C/W
P_D	Power Dissipation in Still Air at 25°C	SOIC-20W TSSOP-20 1302 833	mW
MSL	Moisture Sensitivity	Level 1	-
F_R	Flammability Rating	Oxygen Index: 28 to 34 UL 94 V-0 @ 0.244 in	-
V_{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model 2000 N/A	V
$t_{LATCHUP}$	Latchup Performance (Note 4)	±100	mA

74VHCTxxx – Maximum Ratings

Existing

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating
V_{CC}	Supply Voltage	-0.5V to +7.0V
V_{IN}	DC Input Voltage	-0.5V to +7.0V
V_{OUT}	DC Output Voltage Note 2 Note 3	-0.5V to $V_{CC} + 0.5V$ -0.5V to +7.0V
I_{IK}	Input Diode Current	-20mA
I_{OK}	Output Diode Current ⁽⁴⁾	±20mA
I_{OUT}	DC Output Current	±25mA
I_{CC}	DC V_{CC} / GND Current	±75mA
T_{STG}	Storage Temperature	-65°C to +150°C
T_L	Lead Temperature (Soldering, 10 seconds)	260°C

New

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to +6.5	V
V _{IN}	DC Input Voltage		-0.5 to +6.5	V
V _{OUT}	DC Output Voltage	Active Mode (High or Low State)	-0.5 to V _{CC} + 0.5	V
		Tristate Mode (Note 2)	-0.5 to +6.5	
		Power-Off Mode (V _{CC} = 0 V)	-0.5 to +6.5	
I _{IN}	DC Input Current, per Pin		±20	mA
I _{OUT}	DC Output Current, per Pin		±25	mA
I _{CC}	DC Supply Current, V _{CC} and GND Pins		±75	mA
I _{IK}	Input Clamp Current		-20	mA
I _{OK}	Output Clamp Current		-20	mA
T _{STG}	Storage Temperature Range		-65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds		260	°C
T _J	Junction Temperature under Bias		+150	°C
θ _{JA}	Thermal Resistance (Note 3)		150	°C/W
P _D	Power Dissipation in Still Air at 25°C		833	mW
MSL	Moisture Sensitivity		Level 1	
F _R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.574 in	
V _{ESD}	ESD Withstand Voltage (Note 4)	Human Body Model	2000	V
		Charged Device Model	N/A	

MC74LVXxxx – Maximum Ratings

Existing

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	-0.5 to +7.0	V
V_{IN}	DC Input Voltage	-0.5 to +7.0	V
V_{OUT}	DC Output Voltage	-0.5 to $V_{CC} + 0.5$	V
I_{IK}	Input Diode Current	-20	mA
I_{OK}	Output Diode Current	±20	mA
I_{OUT}	DC Output Current, per Pin	±25	mA
I_{CC}	DC Supply Current, V_{CC} and GND Pins	±75	mA
P_D	Power Dissipation	180	mW
T_{stg}	Storage Temperature	-65 to +150	°C

New

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to +6.5	V
V _{IN}	DC Input Voltage		-0.5 to +6.5	V
V _{OUT}	DC Output Voltage (MC74VHC)		-0.5 to V _{CC} +0.5	V
	DC Output Voltage (MC74VHCT)	Active Mode (High or Low State)	-0.5 to V _{CC} +0.5	
		Tristate Mode (Note 1) Power-Off Mode (V _{CC} = 0 V)	-0.5 to +6.5 -0.5 to +6.5	
I _{IN}	DC Input Current, per Pin		±20	mA
I _{OUT}	DC Output Current, Per Pin		±25	mA
I _{CC}	DC Supply Current, V _{CC} and GND Pins		±75	mA
I _{IK}	Input Clamp Current		-20	mA
I _{OK}	Output Clamp Current	MC74VHC244	±20	mA
		MC74VHCT244A	-20	
T _{STG}	Storage Temperature Range		-65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 secs		260	°C
T _J	Junction Temperature Under Bias		+150	°C
θ _{JA}	Thermal Resistance (Note 2)	SOIC-20W	96	°C/W
		TSSOP-20	150	
P _D	Power Dissipation in Still Air at 25°C	SOIC-20W	1302	mW
		TSSOP-20	833	
MSL	Moisture Sensitivity		Level 1	-
F _R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.244 in	-
V _{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model	2000 N/A	V
LATCHUP	Latchup Performance (Note 4)		±100	mA

MC74LCX244 – Maximum Ratings

Existing

MAXIMUM RATINGS				
Symbol	Parameter	Value	Condition	Units
V _{CC}	DC Supply Voltage	-0.5 to +7.0		V
V _I	DC Input Voltage	-0.5 ≤ V _I ≤ +7.0		V
V _O	DC Output Voltage	-0.5 ≤ V _O ≤ +7.0	Output in 3-State	V
		-0.5 ≤ V _O ≤ V _{CC} + 0.5	Output in HIGH or LOW State (Note 1)	V
I _{IK}	DC Input Diode Current	-50	V _I < GND	mA
I _{OK}	DC Output Diode Current	-50	V _O < GND	mA
		+50	V _O > V _{CC}	mA
I _O	DC Output Source/Sink Current	±50		mA
I _{CC}	DC Supply Current Per Supply Pin	±100		mA
I _{GND}	DC Ground Current Per Ground Pin	±100		mA
T _{STG}	Storage Temperature Range	-65 to +150		°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds	T _L = 260		°C
T _J	Junction Temperature Under Bias	T _J = 150		°C
θ _{JA}	Thermal Resistance (Note 2)	θ _{JA} = 140		°C/W
MSL	Moisture Sensitivity		Level 1	

New

MAXIMUM RATINGS				
Symbol	Parameter	Value	Unit	
V _{CC}	DC Supply Voltage	-0.5 to +6.5	V	
V _I	DC Input Voltage (Note 1)	-0.5 to +6.5	V	
V _O	DC Output Voltage (Note 1)	Active-Mode (High or Low State)	-0.5 to V _{CC} + 0.5	V
		Tri-State Mode	-0.5 to +6.5	
		Power-Down Mode (V _{CC} = 0 V)	-0.5 to +6.5	
I _{IK}	DC Input Diode Current	V _I < GND	-50	mA
I _{OK}	DC Output Diode Current	V _O < GND	-50	mA
I _O	DC Output Source/Sink Current		±50	mA
I _{CC} or I _{GND}	DC Supply Current per Supply Pin or Ground Pin		±100	mA
T _{STG}	Storage Temperature Range		-65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 secs		260	°C
T _J	Junction Temperature Under Bias		+150	°C
θ _{JA}	Thermal Resistance (Note 2)	SOIC-20W	96	°C/W
		WQFN20	99	
		QFN20	111	
		TSSOP-20	150	
P _D	Power Dissipation in Still Air	SOIC-20W	1302	mW
		WQFN20	1256	
		QFN20	1127	
		TSSOP-20	833	
MSL	Moisture Sensitivity	SOIC-20W	Level 3	
		All Other Packages	Level 1	
F _R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
V _{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model	> 2000	V
		Charged Device Model	N/A	

MC74LCX244 – Recommended Operating Conditions

Existing

RECOMMENDED OPERATING CONDITIONS					
Symbol	Parameter	Min	Typ	Max	Units
V _{CC}	Supply Voltage	2.0	3.3	3.6	V
	Operating Data Retention Only	1.5	3.3	3.6	
V _I	Input Voltage	0		5.5	V
V _O	Output Voltage (HIGH or LOW State) (3-State)	0		V _{CC} 5.5	V
I _{OH}	HIGH Level Output Current, V _{CC} = 3.0 V - 3.6 V			-24	mA
I _{OL}	LOW Level Output Current, V _{CC} = 3.0 V - 3.6 V			24	mA
I _{OH}	HIGH Level Output Current, V _{CC} = 2.7 V - 3.0 V			-12	mA
I _{OL}	LOW Level Output Current, V _{CC} = 2.7 V - 3.0 V			12	mA
T _A	Operating Free-Air Temperature	-40		+85	°C
Δt/ΔV	Input Transition Rise or Fall Rate, V _{IN} from 0.8 V to 2.0 V, V _{CC} = 3.0 V	0		10	ns/V

New

RECOMMENDED OPERATING CONDITIONS					
Symbol	Parameter	Min	Typ	Max	Unit
V _{CC}	Supply Voltage	1.65	3.3	5.5	V
	Operating	1.65	3.3	5.5	
	Data Retention Only	1.5	3.3	5.5	
V _I	Digital Input Voltage	0	-	5.5	V
V _O	Output Voltage	Active Mode (High or Low State)	0	-	V _{CC}
		Tri-State Mode	0	-	5.5
		Power Down Mode (V _{CC} = 0 V)	0	-	5.5
T _A	Operating Free-Air Temperature	-55	-	+125	°C
t _r , t _f	Input Rise or Fall Rate	V _{CC} = 1.65 V to 1.95 V	0	20	ns/V
		V _{CC} = 2.3 V to 2.7 V	0	20	
		V _{IN} from 0.8 V to 2.0 V, V _{CC} = 3.0 V	0	10	
		V _{CC} = 4.5 V to 5.5 V	0	5	

MC74LCX244 – DC Electrical Characteristics

Existing

DC ELECTRICAL CHARACTERISTICS				
Symbol	Characteristic	Condition	T _A = -40°C to +85°C	Units
V _{IH}	HIGH Level Input Voltage (Note 2)	2.7 V ≤ V _{CC} ≤ 3.6 V	2.0	V
V _{IL}	LOW Level Input Voltage (Note 2)	2.7 V ≤ V _{CC} ≤ 3.6 V	0.8	V
V _{OH}	HIGH Level Output Voltage	2.7 V ≤ V _{CC} ≤ 3.6 V, I _{OH} = -100 μA	V _{CC} - 0.2	V
		V _{CC} = 2.7 V, I _{OH} = -12 mA	2.2	
		V _{CC} = 3.0 V, I _{OH} = -18 mA	2.4	
		V _{CC} = 3.0 V, I _{OH} = -24 mA	2.2	
V _{OL}	LOW Level Output Voltage	2.7 V ≤ V _{CC} ≤ 3.6 V, I _{OL} = 100 μA	0.2	V
		V _{CC} = 2.7 V, I _{OL} = 12 mA	0.4	
		V _{CC} = 3.0 V, I _{OL} = 16 mA	0.4	
		V _{CC} = 3.0 V, I _{OL} = 24 mA	0.55	
I _{OZ}	3-State Output Current	V _{CC} = 3.6 V, V _{IN} = V _{IH} or V _{IL} , V _{OUT} = 0 to 5.5 V	±5	μA
I _{OFF}	Power Off Leakage Current	V _{CC} = 0, V _{IN} = 5.5 V or V _{OUT} = 5.5 V	10	μA
I _{IN}	Input Leakage Current	V _{CC} = 3.6 V, V _{IN} = 5.5 V or GND	±5	μA
I _{CC}	Quiescent Supply Current	V _{CC} = 3.6 V, V _{IN} = 5.5 V or GND	10	μA
ΔI _{CC}	Increase in I _{CC} per Input	2.3 ≤ V _{CC} ≤ 3.6 V, V _{IN} = V _{CC} - 0.6 V	500	μA

New

DC ELECTRICAL CHARACTERISTICS						
Symbol	Parameter	Conditions	V _{CC} (V)	T _A = -40 °C to +85°C	T _A = -55°C to +125°C	Unit
				Min	Max	
V _{IH}	High-Level Input Voltage		1.65 to 1.95	0.65 × V _{CC}	0.65 × V _{CC}	V
			2.3 to 2.7	1.7	1.7	
			2.7 to 3.6	2.0	2.0	
			4.5 to 5.5	0.7 × V _{CC}	0.7 × V _{CC}	
V _{IL}	Low-Level Input Voltage		1.65 to 1.95	0.35 × V _{CC}	0.35 × V _{CC}	V
			2.3 to 2.7	0.7	0.7	
			2.7 to 3.6	0.8	0.8	
			4.5 to 5.5	0.3 × V _{CC}	0.3 × V _{CC}	
V _{OH}	High-Level Output Voltage	V _I = V _{CC} or V _L , I _{OH} = -100 μA	1.65 to 5.5	V _{CC} - 0.1	V _{CC} - 0.1	V
		I _{OH} = -4 mA	1.65	1.2	1.2	
		I _{OH} = -8 mA	2.3	1.8	1.8	
		I _{OH} = -12 mA	2.7	2.2	2.2	
		I _{OH} = -16 mA	3.0	2.4	2.4	
		I _{OH} = -24 mA	3.0	2.2	2.2	
		I _{OH} = -32 mA	4.5	3.8	3.8	
V _{OL}	Low-Level Output Voltage	V _I = V _{CC} or V _L , I _{OL} = 100 μA	1.65 to 5.5	0.1	0.1	V
		I _{OL} = 4 mA	1.65	0.45	0.45	
		I _{OL} = 8 mA	2.3	0.6	0.6	
		I _{OL} = 12 mA	2.7	0.4	0.4	
		I _{OL} = 16 mA	3.0	0.4	0.4	
		I _{OL} = 24 mA	3.0	0.55	0.55	
		I _{OL} = 32 mA	4.5	0.6	0.6	
I _I	Input Leakage Current	V _I = 0 to 5.5 V	3.6	-	±5.0	μA
I _{OZ}	3-State Output Leakage Current	V _I = V _{CC} or V _L , V _O = 0 V to 5.5 V	3.6	-	±5.0	μA
I _{OFF}	Power Off Leakage Current	V _I = 5.5 V or V _O = 5.5 V	0	-	10	μA
I _{CC}	Quiescent Supply Current	V _I = 5.5 V or GND	3.6	-	10	μA
ΔI _{CC}	Increase in I _{CC} per Input	V _{IN} = V _{CC} - 0.6 V	2.3 to 3.6	-	500	μA

MC74LCX244 – AC Electrical Characteristics

Existing

AC CHARACTERISTICS ($t_{B1} = t_{B2} = 2.5 \text{ ns}$, $R_L = 500 \Omega$)

Symbol	Parameter	Waveform	Limits						Units
			T _A = -55°C to -125°C						
			V _{CC} = 3.0 V to 3.6 V		V _{CC} = 2.7 V		V _{CC} = 2.5 V ± 0.2		
			C _L = 50 pF		C _L = 50 pF		C _L = 30 pF		
			Min	Max	Min	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay Input to Output	1	1.5	6.5	1.5	7.5	1.5	7.8	ns
t _{PZH} t _{PZL}	Output Enable Time to High and Low Level	2	1.5	8.0	1.5	9.0	1.5	10	ns
t _{PHZ} t _{PLZ}	Output Disable Time From High and Low Level	2	1.5	7.0	1.5	8.0	1.5	8.4	ns
t _{OSPH} t _{OSLH}	Output-to-Output Skew (Note 4)			1.0					ns

New

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	$V_{CC} \text{ (V)}$	$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		$T_A = -55^\circ\text{C to } +125^\circ\text{C}$		Unit
				Min	Max	Min	Max	
t_{DHL} t_{DHL}	Propagation Delay, D to O	See Figures 3 and 4	1.65 to 1.95	-	10.3	-	10.3	ns
			2.3 to 2.7	-	7.8	-	7.8	
			2.7	-	7.5	-	7.5	
			3.0 to 3.6	-	6.5	-	6.5	
			4.5 to 5.5	-	5.9	-	5.9	
t_{OEHL} t_{OEHL}	Output Enable Time, OE to O	See Figures 3 and 4	1.65 to 1.95	-	13.0	-	13.0	ns
			2.3 to 2.7	-	10.0	-	10.0	
			2.7	-	9.0	-	9.0	
			3.0 to 3.6	-	8.0	-	8.0	
			4.5 to 5.5	-	7.3	-	7.3	
t_{ODHL} t_{ODHL}	Output Disable Time, OE to O	See Figures 3 and 4	1.65 to 1.95	-	11.0	-	11.0	ns
			2.3 to 2.7	-	8.4	-	8.4	
			2.7	-	8.0	-	8.0	
			3.0 to 3.6	-	7.0	-	7.0	
			4.5 to 5.5	-	6.0	-	6.0	
t_{OSHL} t_{OSHL}	Output to Output Skew (Note 5)		1.65 to 1.95	-	-	-	-	ns
			2.3 to 2.7	-	-	-	-	
			2.7	-	-	-	-	
			3.0 to 3.6	-	1.0	-	1.0	

74LCX244 – Maximum Ratings

Existing

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating
V_{CC}	Supply Voltage	-0.5V to +7.0V
V_I	DC Input Voltage	-0.5V to +7.0V
V_O	DC Output Voltage	-0.5V to +7.0V
	Output in 3-STATE	-0.5V to +7.0V
	Output in HIGH or LOW State ⁽³⁾	-0.5V to $V_{CC} + 0.5V$
I_{IK}	DC Input Diode Current, $V_I < \text{GND}$	-50mA
I_{OK}	DC Output Diode Current $V_O < \text{GND}$	-50mA
	$V_O > V_{CC}$	+50mA
I_O	DC Output Source/Sink Current	±50mA
I_{CC}	DC Supply Current per Supply Pin	±100mA
I_{GD}	DC Ground Current per Ground Pin	±100mA
T_{STG}	Storage Temperature	-65°C to +150°C

New

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	-0.5 to +6.5	V
V_I	DC Input Voltage (Note 1)	-0.5 to +6.5	V
V_O	DC Output Voltage (Note 1)	-0.5 to $V_{CC} + 0.5$	V
	Active-Mode (High or Low State)	-0.5 to +6.5	
	Tri-State Mode	-0.5 to +6.5	
	Power-Down Mode ($V_{CC} = 0 \text{ V}$)	-0.5 to +6.5	
I_{IK}	DC Input Diode Current $V_{IK} < \text{GND}$	-50	mA
I_{OK}	DC Output Diode Current $V_{OUT} < \text{GND}$	-50	mA
I_O	DC Output Source/Sink Current	±50	mA
I_{CC} or I_{GD}	DC Supply Current per Supply Pin or Ground Pin	±100	mA
T_{STG}	Storage Temperature Range	-65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 secs	260	°C
T_J	Junction Temperature Under Bias	+150	°C
θ_{JA}	Thermal Resistance (Note 2)	SOIC-20W 96 WQFN20 99 QFN20 111 TSSOP-20 150	°C/W
P_D	Power Dissipation in Still Air	SOIC-20W 1302 WQFN20 1256 QFN20 1127 TSSOP-20 833	mW
MSL	Moisture Sensitivity	SOIC-20W All Other Packages	Level 3 Level 1
F_R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in
V_{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model > 2000 Charged Device Model N/A	V

74LCX244 – Recommended Operating Conditions

Existing

Recommended Operating Conditions⁽⁴⁾

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Min.	Max.	Units
V _{CC}	Supply Voltage			
	Operating	2.0	3.6	V
	Data Retention	1.5	3.6	
V _I	Input Voltage	0	5.5	V
V _O	Output Voltage			
	3-STATE	0	5.5	V
	HIGH or LOW State	0	V _{CC}	
I _{OH} /I _{OL}	Output Current			
	V _{CC} = 3.0V-3.6V		±24	mA
	V _{CC} = 2.7V-3.0V		±12	
	V _{CC} = 2.3V-2.7V		±8	
T _A	Free-Air Operating Temperature	-40	85	°C
Δt/ΔV	Input Edge Rate, V _{IN} = 0.8V-2.0V, V _{CC} = 3.0V	0	10	ns/V

New

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V _{CC}	Supply Voltage				
	Operating	1.65	3.3	5.5	V
	Data Retention Only	1.5	3.3	5.5	
V _I	Digital Input Voltage	0	-	5.5	V
V _O	Output Voltage				
	Active Mode (High or Low State)	0	-	V _{CC}	V
	Tri-State Mode	0	-	5.5	
	Power Down Mode (V _{CC} = 0 V)	0	-	5.5	
T _A	Operating Free-Air Temperature	-55	-	+125	°C
t _r , t _f	Input Rise or Fall Rate				
	V _{CC} = 1.65 V to 1.95 V	0	-	20	ns/V
	V _{CC} = 2.3 V to 2.7 V	0	-	20	
	V _{IN} from 0.8 V to 2.0 V, V _{CC} = 3.0 V	0	-	10	
	V _{CC} = 4.5 V to 5.5 V	0	-	5	

74LCX244 – DC Electrical Characteristics

Existing

DC Electrical Characteristics

Symbol	Parameter	V _{CC} (V)	Conditions	T _A = -40°C to +85°C		Units
				Min.	Max.	
V _{IH}	HIGH Level Input Voltage	2.3-2.7		1.7		V
		2.7-3.6		2.0		
V _{IL}	LOW Level Input Voltage	2.3-2.7			0.7	V
		2.7-3.6			0.8	
V _{OH}	HIGH Level Output Voltage	2.3-3.6	I _{OH} = -100μA	V _{CC} - 0.2		V
		2.3	I _{OH} = -8mA	1.8		
		2.7	I _{OH} = -12mA	2.2		
		3.0	I _{OH} = -18mA	2.4		
			I _{OH} = -24mA	2.2		
V _{OL}	LOW Level Output Voltage	2.3-3.6	I _{OL} = 100μA		0.2	V
		2.3	I _{OL} = 8mA		0.6	
		2.7	I _{OL} = 12mA		0.4	
		3.0	I _{OL} = 16mA		0.4	
			I _{OL} = 24mA		0.55	
I _I	Input Leakage Current	2.3-3.6	0 ≤ V _I ≤ 5.5V		±5.0	μA
I _{OZ}	3-STATE Output Leakage	2.3-3.6	0 ≤ V _O ≤ 5.5V, V _I = V _{IH} or V _{IL}		±5.0	μA
I _{OFF}	Power-Off Leakage Current	0	V _I or V _O = 5.5V		10	μA
I _{CC}	Quiescent Supply Current	2.3-3.6	V _I = V _{CC} or GND, 3.6V ≤ V _I , V _O ≤ 5.5V ⁽⁵⁾		±10	μA
ΔI _{CC}	Increase in I _{CC} per Input	2.3-3.6	V _{IH} = V _{CC} - 0.6V		500	μA

New

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	T _A = -40 °C to +85°C		T _A = -55°C to +125°C		Unit	
			V _{CC} (V)	Min	Max	Min		Max
V _{IH}	High-Level Input Voltage		1.65 to 1.95	0.65 x V _{CC}		0.65 x V _{CC}	V	
			2.3 to 2.7	1.7		1.7		
			2.7 to 3.6	2.0		2.0		
			4.5 to 5.5	0.7 x V _{CC}		0.7 x V _{CC}		
V _{IL}	Low-Level Input Voltage		1.65 to 1.95		0.35 x V _{CC}		0.35 x V _{CC}	V
			2.3 to 2.7		0.7		0.7	
			2.7 to 3.6		0.8		0.8	
			4.5 to 5.5		0.3 x V _{CC}		0.3 x V _{CC}	
V _{OH}	High-Level Output Voltage	V _I = V _{IH} or V _{IL} I _{OH} = -100 μA I _{OH} = -4 mA I _{OH} = -8 mA I _{OH} = -12 mA I _{OH} = -16 mA I _{OH} = -24 mA I _{OH} = -32 mA	1.65 to 5.5	V _{CC} - 0.1	-	V _{CC} - 0.1	-	V
			1.65	1.2	-	1.2	-	-
			2.3	1.8	-	1.8	-	-
			2.7	2.2	-	2.2	-	-
			3.0	2.4	-	2.4	-	-
			3.0	2.2	-	2.2	-	-
			4.5	3.8	-	3.8	-	-
			V _{OL}	Low-Level Output Voltage	V _I = V _{IH} or V _{IL} I _{OL} = 100 μA I _{OL} = 4 mA I _{OL} = 8 mA I _{OL} = 12 mA I _{OL} = 16 mA I _{OL} = 24 mA I _{OL} = 32 mA	1.65 to 5.5	-	0.1
1.65	-	0.45				-	0.45	-
2.3	-	0.6				-	0.6	-
2.7	-	0.4				-	0.4	-
3.0	-	0.4				-	0.4	-
3.0	-	0.55				-	0.55	-
4.5	-	0.6				-	0.6	-
I _I	Input Leakage Current	V _I = 0 to 5.5 V				3.6	-	±5.0
I _{OZ}	3-State Output Leakage Current	V _I = V _{IH} or V _{IL} , V _O = 0 V to 5.5 V	3.6	-	±5.0	-	±5.0	μA
I _{OFF}	Power Off Leakage Current	V _I = 5.5 V or V _O = 5.5 V	0	-	10	-	10	μA
I _{CC}	Quiescent Supply Current	V _I = 5.5 V or GND	3.6	-	10	-	10	μA
ΔI _{CC}	Increase in I _{CC} per Input	V _{IH} = V _{CC} - 0.6 V	2.3 to 3.6	-	500	-	500	μA

74LCX244 – AC Electrical Characteristics

Existing

AC Electrical Characteristics

Symbol	Parameter	T _A = -40°C to +85°C, R _L = 500Ω						Units
		V _{CC} = 3.3V ± 0.3V, C _L = 50pF		V _{CC} = 2.7V, C _L = 50pF		V _{CC} = 2.5V ± 0.2V, C _L = 30pF		
		Min.	Max.	Min.	Max.	Min.	Max.	
t _{PHL} , t _{PLH}	Propagation Delay, Data to Output	1.5	6.5	1.5	7.5	1.5	7.8	ns
t _{PZL} , t _{PZH}	Output Enable Time	1.5	8.0	1.5	9.0	1.5	10.0	ns
t _{PLZ} , t _{PHZ}	Output Disable Time	1.5	7.0	1.5	8.0	1.5	8.4	ns
t _{OSHL} , t _{OSLH}	Output to Output Skew ⁽⁶⁾		1.0					ns

New

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	V _{CC} (V)	T _A = -40°C to +85°C		T _A = -55°C to +125°C		Unit
				Min	Max	Min	Max	
t _{PHL} , t _{PLH}	Propagation Delay, D to O	See Figures 3 and 4	1.65 to 1.95	-	10.3	-	10.3	ns
			2.3 to 2.7	-	7.8	-	7.8	
			2.7	-	7.5	-	7.5	
			3.0 to 3.6	-	6.5	-	6.5	
			4.5 to 5.5	-	5.9	-	5.9	
t _{PEL} , t _{PLE}	Output Enable Time, OE to O	See Figures 3 and 4	1.65 to 1.95	-	13.0	-	13.0	ns
			2.3 to 2.7	-	10.0	-	10.0	
			2.7	-	9.0	-	9.0	
			3.0 to 3.6	-	8.0	-	8.0	
			4.5 to 5.5	-	7.3	-	7.3	
t _{PSL} , t _{PSH}	Output Disable Time, OE to O	See Figures 3 and 4	1.65 to 1.95	-	11.0	-	11.0	ns
			2.3 to 2.7	-	8.4	-	8.4	
			2.7	-	8.0	-	8.0	
			3.0 to 3.6	-	7.0	-	7.0	
			4.5 to 5.5	-	6.0	-	6.0	
t _{OSL} , t _{OSH}	Output to Output Skew (Note 5)		1.65 to 1.95	-	-	-	-	ns
			2.3 to 2.7	-	-	-	-	
			2.7	-	-	-	-	
			3.0 to 3.6	-	1.0	-	1.0	

List of Affected Parts:

Note: Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the [PCN Customized Portal](#).

Part Number	Qualification Vehicle
MC74LCX244DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
74LCX244WMX	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC374DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC245DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT245ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT541ADWG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC573DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC541DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT541ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
74LCX244WM	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX541DWG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX373DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC244DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT244ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX244DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LCX244DWG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC540DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G



Final Product/Process Change Notification

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MC74LVX574DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT245ADWG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC373DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX240DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC240DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX245DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC245DWG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX374DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74LVX573DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC574DWG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHC574DWR2G	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT240ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT373ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
74VHCT541AMX	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT574ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT573ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G
MC74VHCT374ADWRG	MC74HC244ADWR2G, NLV74HC244ADWR2G