

PCN Number:	20210215001.2		PCN Date:	Feb 16, 2021
Title:	TPS92520-Q1 Design Change and Datasheet Updates			
Customer Contact:	PCN Manager		Dept:	Quality Services
Proposed 1st Ship Date:	Aug 16, 2021	Estimated Sample Availability:	Date provided at sample request.	
Change Type:				
<input type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Design	<input checked="" type="checkbox"/>	Electrical Specification	<input type="checkbox"/>
<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>
<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>	Wafer Bump Material	<input type="checkbox"/>
<input type="checkbox"/>	Wafer Fab Site	<input type="checkbox"/>	Wafer Fab Materials	<input type="checkbox"/>
	<input type="checkbox"/>	Part number change		

PCN Details

Description of Change:

This notification is to inform of a minor design change and datasheet update to the TPS92520QDADRQ1 and TPS92520QDAPRQ1 devices. The design change was performed to enhance current limit protection and increase minimum on time.

The Die Revision and Datasheet Number will be changing:

Current		New	
Die Revision	Datasheet Number	Die Revision	Datasheet Number
C1	SLUSD66C	C2	SLUSD66D

The product datasheet(s) is updated as seen in the change revision history below:



TPS92520-Q1

SLUSD66D – SEPTEMBER 2019 – REVISED FEBRUARY 2021

TPS92520-Q1 4.5-V to 65-V Dual 1.6-A Synchronous Buck LED Driver with SPI Control

4 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision C (June 2020) to Revision D (February 2021)	Page
• Updated the numbering format for tables, figures and cross-references throughout the document.....	1
• Updated the minimum on-time specification from 90-ns typical to 105-ns typical.....	5
• Added "SWx to PGND (< 10 μs)" row to <i>Absolute Maximum Ratings</i> table.....	5
• Added "CSPx to CSNx (< 100 μs)" row to <i>Absolute Maximum Ratings</i> table.....	5
• Updated t _{ONx(MIN)} MIN value from "75" to "87".....	5
• Updated t _{ONx(MIN)} TYP value from "90" to "105".....	5
• Updated t _{ONx(MIN)} MAX value from "105" to "123".....	5
• Updated Figure 6-17	10
• Updated the <i>Functional Block Diagram</i>	15
• Updated "90 ns" to 105 ns" in <i>Minimum On-Time, Off-Time, and Inductor Ripple</i> section.....	17
• Updated "1.24 V" to "1.22 V" in the <i>External PWM Dimming and Input Undervoltage Lockout</i> section.....	19
• Updated "I _~ 220 μA" to "10 μA" in the <i>External PWM Dimming and Input Undervoltage Lockout</i> section.....	19
• Updated "2.8 V" to "2.95 V" in the BSTx Undervoltage Lockout description.....	23
• Updated "2.8 A" to "2.7 A" in the High-Side Switch Current Limit description.....	23
• Updated "2.5 A" to "1.5 A" in the Low-Side Switch Current Limit description.....	23
• Updated "4 ms" to "3.6 ms" in the <i>Faults and Diagnostics</i> section.....	23
• Updated "32 ms" to "28.8 ms" in the <i>Faults and Diagnostics</i> section.....	23

These changes may be reviewed at the datasheet links provided:
<https://www.ti.com/lit/ds/symlink/tps92520-q1.pdf>

Reason for Change:

Improved product robustness

Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):

None

Changes to product identification resulting from this PCN:

Die Rev designator will change as shown in the table and sample label below:

Current	New
Die Rev [2P]	Die Rev [2P]
C1	C2

Sample product shipping label (not actual product label)

TEXAS INSTRUMENTS
 MADE IN: Malaysia
 2DC: 2d:
 MSL 2 / 260C / 1 YEAR SEAL DT
 MSL 1 / 235C / UNLIM 03/29/04
 OPT: 39
 ITEM: 39
 LBL: 5A (L)T0:1750
 (Pb) G4
 (1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483SI2
 (P)
 (2P) REV: (V) 0033317
 (20L) CS0: SHE (21L) CCO: USA
 (22L) AS0: MLA (23L) ACO: MYS

Product Affected:

TPS92520QDADRQ1	TPS92520QDAPRQ1
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**Automotive New Product Qualification Summary
 (As per AEC-Q100 and JEDEC Guidelines)**

Approved 8-Feb-2021

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TPS92520QDAP Q1 PG3.2	QBS Product Reference: TPS92520QDAD Q1 PG3.1	QBS Product Reference: TPS92520QDAD Q1 PG3.0	QBS Product Reference: TPS92520QDAD Q1 PG2.0	QBS Product Reference: TPS92520QDAD Q1 PG1.2	QBS Process Reference: LM74700QDBV -B0
Test Group A – Accelerated Environment Stress Tests												
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning Level 2	168/85C/60% RH	-	-	Pass	Pass	Pass	Pass
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	-	-	1/77/0	2/154/0	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	-	-	-	1/77/0	2/154/0	2/154/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	-	-	1/77/0	1/77/0	2/154/0	2/154/0
TC-BP	A4	MIL-STD883 Method 2011	1	60	Post TC Bond Pull	500 Cycles	-	-	-	1/60/0	2/120/0	1/5/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	-	-	1/45/0	-	1/45/0	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	-	1/77/0	2/154/0	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests												
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	408 Hours	-	-	1/77/0	2/154/0	-	2/154/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	-	-	1/800/0	-	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	N/A	N/A	N/A	N/A

Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TPS92520QDAP Q1 PG3.2	QBS Product Reference: TPS92520QDAD Q1 PG3.1	QBS Product Reference: TPS92520QDAD Q1 PG3.0	QBS Product Reference: TPS92520QDAD Q1 PG2.0	QBS Product Reference: TPS92520QDAD Q1 PG1.2	QBS Process Reference: LM74700QDBV -B0
Test Group C – Package Assembly Integrity Tests												
WBS	C1	AEC Q100-001	1	30	Auto Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	-	-	-	1/30/0	2/60/0	-
WBP	C2	MIL-STD883 Method 2011	1	30	Auto Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	-	-	-	1/30/0	2/60/0	-
SD	C3	JEDEC JESD22-B102	1	15	Auto Solderability (Pb and Pb-Free)	>95% Lead Coverage 8 Hr Steam Age	-	-	-	-	1/15/0	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Auto Physical Dimensions	Cpk>1.67	-	-	-	1/30/0	2/60/0	-
LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	-	-	-	-	1/5/0	2/10/0	-
Test Group D – Die Fabrication Reliability Tests												
EM	D1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDD	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

Test Group E – Electrical Verification Tests												
HBM	E2	AEC Q100-002	1	3	ESD - HBM - Q100	2500 V	1/3/0	1/3/0	-	-	-	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	1000 V	1/3/0	1/3/0	-	-	-	-
LU	E4	AEC Q100-004	1	6	Latch-up	Latchup-2/125C	1/6/0	1/6/0	-	-	-	-
ED	E5	AEC Q100-009	3	30	Auto Electrical Distributions	Cpk>1.67 Room, hot, and cold test	1/30/0	3/90/0	-	-	-	-

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

Ambient Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40°C to +150°C

Grade 1 (or Q): -40°C to +125°C

Grade 2 (or T): -40°C to +105°C

Grade 3 (or I): -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold: HTOL, ED

Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room: AC/uHAST

Green/Pb-free Status:

Qualified Pb-Free (SMT) and Green

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