Dual-Channel Constant-Voltage and Constant-Current Controller with SPI Interface

Descriptions

The CPSQ5453 is a dual full-independent channel constant-voltage and constant-current controller. CPSQ5453 operates over a wide input voltage range from 4.5V to 65V with SPI interface.

The CPSQ5453 applies Peak-Current (PCM) control mode which provides fast load transient response and easy loop design and requires a minimal number of readily-available, standard, external components. The frequency is programmable from 100kHz to 700kHz.

CPSQ5453 can operated under CC or CV mode. The SPI also provide info measurement for diagnostic and fault protection setting. The interrupt can be indicated by Fault 1 or 2.

The CPSQ5453 is very versatile for automotive LED application. It can achieve current accuracy can up to 4% over wide input voltage, output voltage and ambient temperature. CPSQ5453 support both analog dimming or PWM dimming. Limp-home provide a separate configure for functional safety design.

The CPSQ5453 integrates full protections features including output over-voltage and under-voltage protection, LED over-current protection, cycle-by-cycle current limit, thermal warning and shutdown protection.

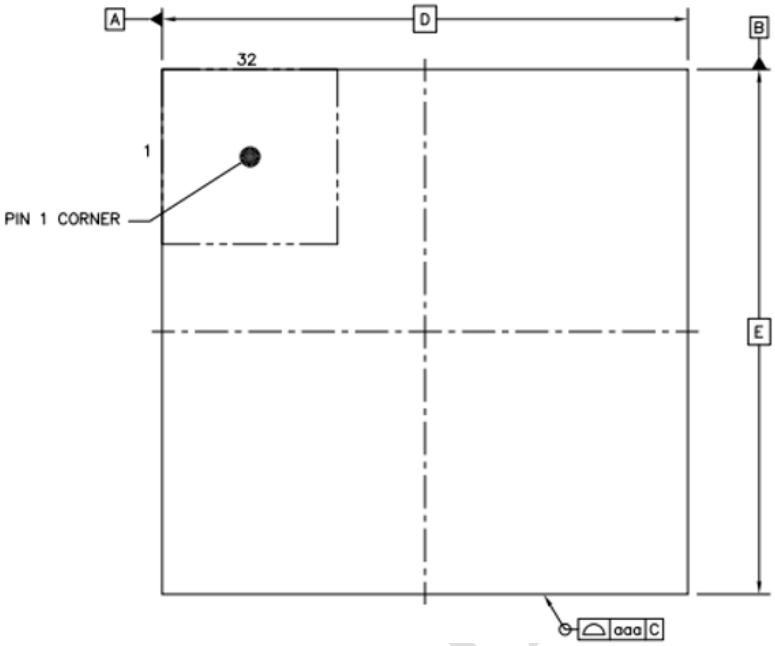
Features

- AEC-Q100 Grade-1 Qualified for Automotive Applications
- Wide Input Voltage Range from 4.5V to 65V
- Dual Full-Independent Channel
- Constant Current with 4% Accuracy
- Programmable Switching Frequency from 100kHz to 700kHz
- Up to 1MHz External clock synchronization
- 1000:1 Analog and PWM Dimming
- SPI Interface
  - Configure CC/CV mode
  - Functional Safety for Fault Monitor and Report
  - Dual Channel connected in-Phase
  - Protection Threshold Setting
- Comprehensive protection features.
- Limp-Home
- EMI Improvement
- OTP for Limp-Home mode(ASIL improve)
- Offset current compensation
- Available 5mm x 5mm QFN package

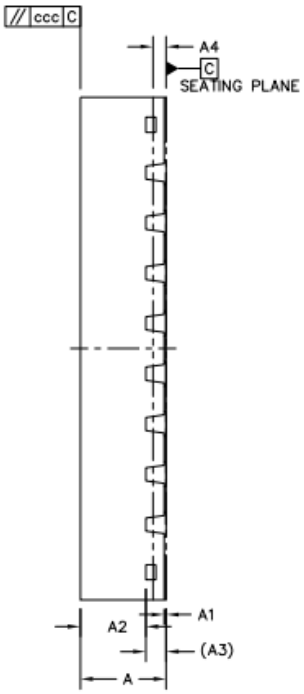
Applications

- Automotive Headlight
- LED Driving Module

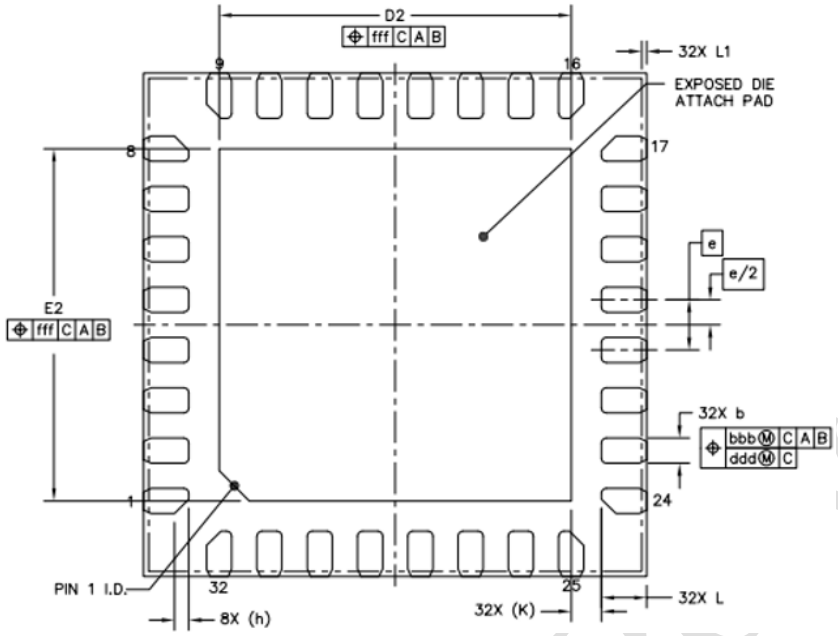
1. Package Information



Top view



Side View



Bottom View

unit: mm

		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.8	0.85	0.9
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.65	---
L/F THICKNESS		A3		0.203 REF	
SIDE WETTABLE DEPTH		A4	0.075	---	0.18
LEAD WIDTH		b	0.2	0.25	0.3
BODY SIZE	X	D		5 BSC	
	Y	E		5 BSC	
LEAD PITCH		e		0.5 BSC	
EP SIZE	X	D2	3.4	3.5	3.6
	Y	E2	3.4	3.5	3.6
LEAD LENGTH		L	0.35	0.45	0.55
SIDE WETTABLE WIDTH		L1	0.01	---	0.09
LEAD TIP TO EXPOSED PAD EDGE		K	0.2	---	---
CORNER LEAD WIDTH		h		0.14 REF	
PACKAGE EDGE TOLERANCE		aaa		0.1	
MOLD FLATNESS		ccc		0.1	
LEAD OFFSET		bbb		0.1	
		ddd		0.05	
EXPOSED PAD OFFSET		fff		0.1	

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