

Low-Power Economy BiCMOS Current-Mode PWM

Check for Samples: [UCC2813-0](#), [UCC2813-1](#), [UCC2813-2](#), [UCC2813-3](#), [UCC2813-4](#), [UCC2813-5](#), [UCC3813-0](#), [UCC3813-1](#), [UCC3813-2](#), [UCC3813-3](#), [UCC3813-4](#), [UCC3813-5](#)

FEATURES

- 100- μ A Typical Starting Supply Current
- 500- μ A Typical Operating Supply Current
- Operation to 1 MHz
- Internal Soft Start
- Internal Fault Soft Start
- Internal Leading-Edge Blanking of the Current-Sense Signal
- 1-A Totem-Pole Output
- 70-ns Typical Response from Current-Sense to Gate-Drive Output
- 1.5% Tolerance Voltage Reference
- Same Pinout as UCC3802, UC3842, and UC3842A

DESCRIPTION

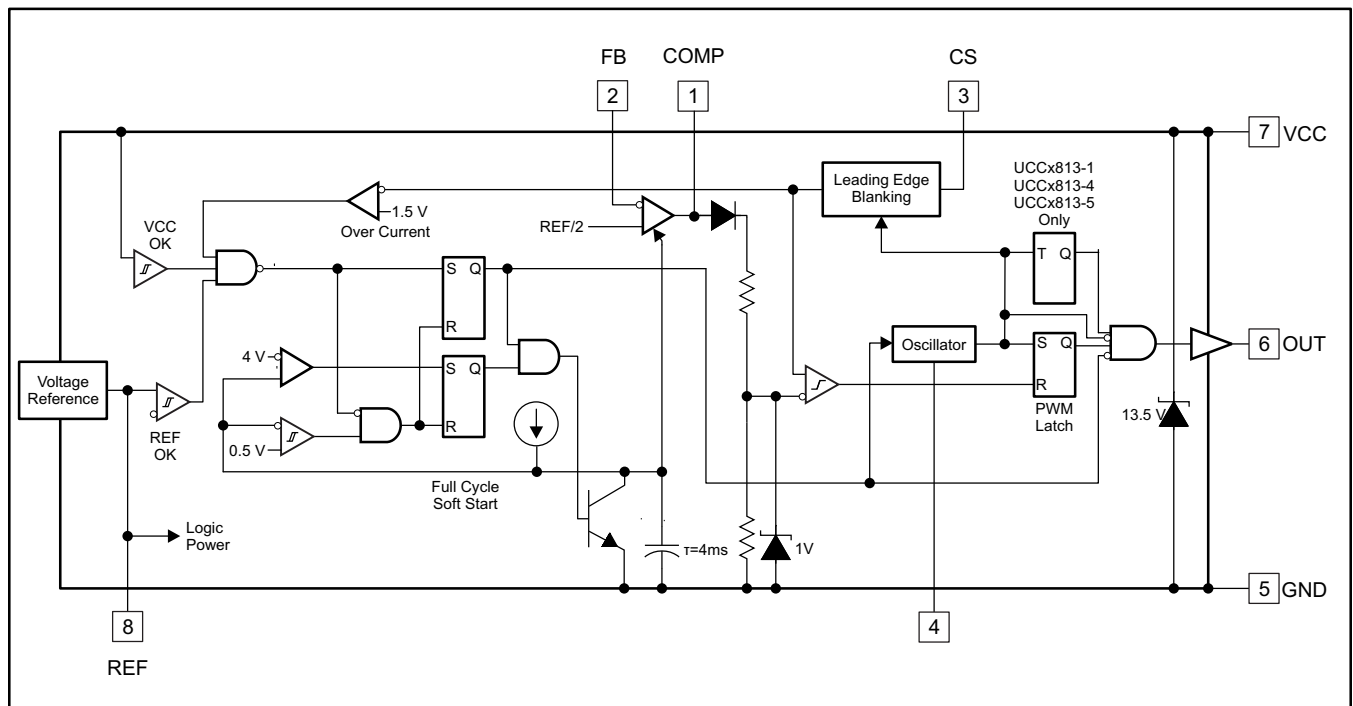
The UCC3813-x family of high-speed, low-power integrated circuits contain all of the control and drive components required for off-line and DC-to-DC fixed-frequency current-mode switching power supplies with minimal parts count.

These devices have the same pin configuration as the UC384x family, and also offer the added features of internal full-cycle soft start and internal leading-edge blanking of the current-sense input.

The UCC3813-x family offers a variety of package options, temperature-range options, choice of maximum duty cycle, and choice of critical voltage levels. Lower reference parts such as the UCC3813-3 and UCC38135 fit best into battery operated systems, while the higher reference and the higher UVLO hysteresis of the UCC3813-2 and UCC3813-4 make these ideal choices for use in off-line power supplies.

The UCC2813-x series is specified for operation from -40°C to $+85^{\circ}\text{C}$ and the UCC3813-x series is specified for operation from 0°C to 70°C .

BLOCK DIAGRAM



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

Part Number ⁽¹⁾	Maximum Duty Cycle	Reference Voltage	Turn-On Threshold	Turn-Off Threshold
UCCx813-0	100%	5 V	7.2 V	6.9 V
UCCx813-1	50%	5 V	9.4 V	7.4 V
UCCx813-2	100%	5 V	12.5 V	8.3 V
UCCx813-3	100%	4 V	4.1 V	3.6 V
UCCx813-4	50%	5 V	12.5 V	8.3 V
UCCx813-5	50%	4 V	4.1 V	3.6 V

(1) The x in the part number refers to temperature range difference between UCC2813 and UCC3813.

ABSOLUTE MAXIMUM RATINGS⁽¹⁾⁽²⁾

over operating free-air temperature range (unless otherwise noted)

	MIN	MAX	UNIT
Analog inputs (FB, CS, RC, COMP)	–3 to the lesser of 6.3 or VCC + 0.3		V
VCC voltage ⁽³⁾		12	V
OUT current		±1	A
VCC current		30	mA
OUT energy (capacitive load)		20	μJ
Power dissipation at T _A < 25°C	D package	0.65	W
	N package	1	W
Junction temperature	–55	150	°C
Storage temperature	–65	150	°C

- (1) All voltages are with respect to GND. All currents are positive into the specified terminal. Consult Unitorde Integrated Circuits databook for information regarding thermal specifications and limitations of packages.
- (2) Stresses beyond those listed under *absolute maximum ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (3) In normal operation VCC is powered through a current limiting resistor. Absolute maximum of 12 V applies when VCC is driven from a low impedance source such that ICC does not exceed 30 mA. The resistor must be sized so that the VCC voltage under operating conditions is below 12 V but above the turnoff threshold.

Thermal Information

THERMAL METRIC ⁽¹⁾		UCCx813-X	UCCx813-X	UCCx813-X	UNITS
		DIL (P)	SOIC (D)	TSSOP (PW)	
		8 PINS	8 PINS	8 PINS	
θ _{JA}	Junction-to-ambient thermal resistance ⁽²⁾	50.9	107.5	153.8	°C/W
θ _{JCTop}	Junction-to-case (top) thermal resistance ⁽³⁾	40.3	49.3	38.4	
θ _{JB}	Junction-to-board thermal resistance ⁽⁴⁾	28.1	48.7	83.8	
ψ _{JT}	Junction-to-top characterization parameter ⁽⁵⁾	17.6	6.6	2.2	
ψ _{JB}	Junction-to-board characterization parameter ⁽⁶⁾	28.0	48.0	82.0	

- (1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report, [SPRA953](#).
- (2) The junction-to-ambient thermal resistance under natural convection is obtained in a simulation on a JEDEC-standard, high-K board, as specified in JESD51-7, in an environment described in JESD51-2a.
- (3) The junction-to-case (top) thermal resistance is obtained by simulating a cold plate test on the package top. No specific JEDEC-standard test exists, but a close description can be found in the ANSI SEMI standard G30-88.
- (4) The junction-to-board thermal resistance is obtained by simulating in an environment with a ring cold plate fixture to control the PCB temperature, as described in JESD51-8.
- (5) The junction-to-top characterization parameter, ψ_{JT}, estimates the junction temperature of a device in a real system and is extracted from the simulation data for obtaining θ_{JA}, using a procedure described in JESD51-2a (sections 6 and 7).
- (6) The junction-to-board characterization parameter, ψ_{JB}, estimates the junction temperature of a device in a real system and is extracted from the simulation data for obtaining θ_{JA}, using a procedure described in JESD51-2a (sections 6 and 7).

ELECTRICAL CHARACTERISTICS

Unless otherwise stated, these specifications apply for $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ for UCC2813-x; $0^{\circ}\text{C} \leq T_A \leq +70^{\circ}\text{C}$ for UCC3813-x; $V_{CC} = 10\text{ V}^{(1)}$; $R_T = 100\text{ k}$ from REF to RC; $C_T = 330\text{ pF}$ from RC to GND; $0.1\text{-}\mu\text{F}$ capacitor from VCC to GND; $0.1\text{-}\mu\text{F}$ capacitor from VREF to GND. $T_A = T_J$.

PARAMETER		TEST CONDITIONS	UCC2813-x UCC3813-x			UNIT
			MIN	TYP	MAX	
Reference Section						
	Output voltage	T _J = 25°C, I = 0.2 mA, UCCx813-0 / -1 / -2 / -4	4.925	5	5.075	V
		T _J = 25°C, I = 0.2 mA, UCCx813-3 / -5	3.94	4	4.06	
	Load regulation	0.2 mA < I < 5 mA		10	30	mV
	Total variation	UCCx813-0 / -1 / -2 / -4 ⁽²⁾	4.84	5	5.1	V
		UCCx813-5, UCCx813-3 ⁽²⁾	3.84	4	4.08	
	Output noise voltage	10 Hz ≤ f ≤ 10 kHz, T _J = 25°C ⁽³⁾		70		μV
	Long term stability	T _A = 125°C, 1000 Hours ⁽³⁾		5		mV
	Output short circuit		−5		−35	mA
Oscillator Section						
	Oscillator frequency	UCCx813-0 / -1 / -2 / -4 ⁽⁴⁾	40	46	52	kHz
		UCCx813-3 / -5 ⁽⁴⁾	26	31	36	
	Temperature stability	See ⁽³⁾		2.5		%
	Amplitude peak-to-peak		2.25	2.4	2.55	V
	Oscillator peak voltage			2.45		V
Error Amplifier Section						
	Input voltage	COMP = 2.5 V; UCCx813-0 / -1 / -2 / -4	2.42	2.5	2.56	V
		COMP = 2 V; UCCx813-3 / -5	1.92	2	2.05	
	Input bias current		−2		2	μA
	Open loop voltage gain		60	80		dB
	COMP sink current	FB = 2.7 V, COMP = 1.1 V	0.4		2.5	mA
	COMP source current	FB = 1.8 V, COMP = REF − 1.2 V	−0.2	−0.5	−0.8	mA
	Gain bandwidth product	See ⁽³⁾		2		MHz
PWM Section						
	Maximum duty cycle	UCCx813-0 / -2 / -3	97	99	100	%
		UCCx813-1 / -4 / -5	48	49	50	
	Minimum duty cycle	COMP = 0 V			0	%
Current Sense Section						
	Gain	See ⁽⁵⁾	1.1	1.65	1.8	V/V
	Maximum input signal	COMP = 5 V ⁽⁶⁾	0.9	1	1.1	V
	Input bias current		−200		200	nA
	CS blank time		50	100	150	ns
	overcurrent threshold		1.32	1.55	1.7	V
	COMP to CS offset	CS = 0 V	0.45	0.9	1.35	V

(1) Adjust VCC above the start threshold before setting at 10 V.

(2) Total Variation includes temperature stability and load regulation.

(3) Ensured by design. Not 100% tested in production.

(4) Oscillator frequency for the UCCx813-0, UCCx813-2, and UCCx813-3 is the output frequency.

Oscillator frequency for the UCCx813-1, UCCx813-4, and UCCx813-5 is twice the output frequency.

$$A = \frac{\Delta V_{\text{COMP}}}{\Delta V_{\text{CS}}} \quad 0 \leq V_{\text{CS}} \leq 0.8\text{ V}$$

(5) Gain is defined by:

(6) Parameter measured at trip point of latch with Pin 2 at 0 V.

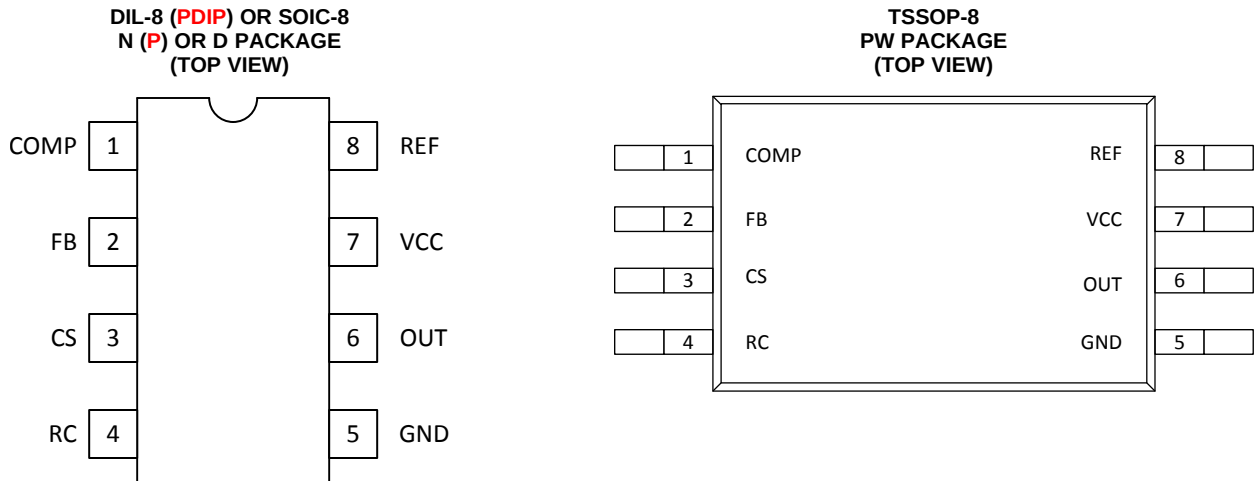
ELECTRICAL CHARACTERISTICS (continued)

Unless otherwise stated, these specifications apply for $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ for UCC2813-x; $0^{\circ}\text{C} \leq T_A \leq +70^{\circ}\text{C}$ for UCC3813-x; $V_{CC} = 10\text{ V}^{(1)}$; $R_T = 100\text{ k}$ from REF to RC; $C_T = 330\text{ pF}$ from RC to GND; $0.1\text{-}\mu\text{F}$ capacitor from VCC to GND; $0.1\text{-}\mu\text{F}$ capacitor from VREF to GND. $T_A = T_J$.

PARAMETER		TEST CONDITIONS	UCC2813-x UCC3813-x			UNIT	
			MIN	TYP	MAX		
Output Section							
	OUT low level	I = 20 mA, all parts		0.1	0.4	V	
		I = 200 mA, all parts		0.35	0.9		
		I = 50 mA, VCC = 5 V, UCCx813-3 / -5		0.15	0.4		
		I = 20 mA, VCC = 0 V, all parts		0.7	1.2		
V _{CC} -OUT	OUT high VsAT	I = –20 mA, all parts		0.15	0.4	V	
		I = –20 0mA, all parts		1	1.9		
		I = –50 mA, VCC = 5 V, UCCx813-3 / -5		0.4	0.9		
	Rise time	CL= 1 nF		41	70	ns	
	Fall time	CL = 1 nF		44	75	ns	
Undervoltage Lockout Section							
	Start threshold ⁽⁷⁾	UCCx813-0		6.6	7.2	7.8	V
		UCCx813-1		8.6	9.4	10.2	
		UCCx813-2 / -4		11.5	12.5	13.5	
		UCCx813-3 / -5		3.7	4.1	4.5	
	Stop threshold ⁽⁷⁾	UCC1813-0		6.3	6.9	7.5	V
		UCC1813-1		6.8	7.4	8	
		UCCx813-2 / -4		7.6	8.3	9	
		UCCx813-3 / -5		3.2	3.6	4	
	Start to stop hysteresis	UCCx813-0		0.12	0.3	0.48	V
		UCCx813-1		1.6	2	2.4	
		UCCx813-2 / -4		3.5	4.2	5.1	
		UCCx813-3 / -5		0.2	0.5	0.8	
Soft Start Section							
	COMP rise time	FB = 1.8 V, Rise from 0.5 V to REF – 1 V		4		ms	
Overall Section							
	Start-up current	VCC < Start Threshold		0.1	0.23	mA	
	Operating supply current	FB = 0 V, CS = 0 V, RC = 0 V		0.5	1.2	mA	
	VCC internal Zener voltage	ICC = 10 mA ⁽⁷⁾		12	13.5	15	V
	VCC internal Zener voltage minus start-threshold voltage	UCCx813-2 / -4		0.5	1		V

(7) Start threshold, stop threshold, and Zener-shunt thresholds track one another.

DEVICE INFORMATION



PIN DESCRIPTIONS

COMP: COMP is the output of the error amplifier and the input of the PWM comparator.

Unlike other devices, the error amplifier in the UCC3813 family is a true low-output-impedance 2-MHz operational amplifier. As such, the COMP terminal both sources and sinks current. However, the error amplifier is internally current limited, so that zero duty cycle is commanded by externally forcing COMP to GND.

The UCC3813 family features built-in full cycle soft start. Soft start is implemented as a clamp on the maximum COMP voltage.

CS: CS is the input to the current-sense comparators. The UCC3813 family has two different current-sense comparators: the PWM comparator and an overcurrent comparator.

The UCC3813 family contains digital current-sense filtering, which disconnects the CS terminal from the current sense comparator during the 100-ns interval immediately following the rising edge of the OUT pin. This digital filtering, also called leading-edge blanking, means that in most applications, no analog filtering (RC filter) is required on CS. Compared to an external RC filter technique, the leading-edge blanking provides a smaller effective CS to OUT propagation delay. Note, however, that the minimum non-zero On-Time of the OUT signal is directly affected by the leading-edge-blanking and the CS to OUT propagation delay.

The overcurrent comparator is only intended for fault sensing, and exceeding the overcurrent threshold causes a soft start cycle.

FB: FB is the inverting input of the error amplifier. For best stability, keep FB lead length as short as possible and FB stray capacitance as small as possible.

GND: GND is reference ground and power ground for all functions on this part.

OUT: OUT is the output of a high-current power driver capable of driving the gate of a power MOSFET with peak currents exceeding ± 750 mA. OUT is actively held low when VCC is below the UVLO threshold.

The high-current power driver consists of FET output devices, which can switch all of the way to GND and all of the way to VCC. The output stage also provides a very low impedance to overshoot and undershoot which means that in many cases, external schottky clamp diodes are not required.

RC: RC is the oscillator timing pin. For fixed frequency operation, set the timing-capacitor charging current by connecting a resistor from REF to RC. Set frequency by connecting a timing capacitor from RC to GND. For best performance, keep the timing capacitor lead to GND as short and direct as possible. If possible, use separate ground traces for the timing capacitor and all other functions.

The frequency of oscillation is estimated with the following equations:

$$\text{UCCx813} - 0/-1/-2/-4: \quad F = \frac{1.5}{R \times C}$$

$$\text{UCCx813} - 3, \text{UCCx813} - 5: \quad F = \frac{1}{R \times C}$$

where

- frequency is in hertz
- resistance is in ohms
- capacitance is in farads

(1)

The recommended range of timing resistors is between 10 and 200 k and timing capacitor is 100 to 1000 pF. Never use a timing resistor less than 10 k.

REF: REF is the voltage reference for the error amplifier and also for many other functions on the IC. REF is also used as the logic power supply for high speed switching logic on the IC.

When VCC is greater than 1 V and less than the UVLO threshold, REF is pulled to ground through a 5-kΩ resistor which means that REF is used as a logic output indicating power-system status. For referencing stability, bypassing REF to GND with a ceramic capacitor as close to the pin as possible is important. An electrolytic capacitor is also used in addition to the ceramic capacitor. A minimum of 0.1-μF ceramic is required. Additional REF bypassing is required for external loads greater than 2.5 mA on the reference.

To prevent noise problems with high speed switching transients, bypass REF to ground with a ceramic capacitor very close to the IC package.

VCC: VCC is the power input connection for this device. In normal operation VCC is powered through a current limiting resistor. Although quiescent VCC current is very low, total supply current will be higher, depending on OUT current. Total VCC current is the sum of quiescent VCC current and the average OUT current. Knowing the operating frequency and the MOSFET gate charge (Qg), average OUT current can be calculated from [Equation 2](#).

$$I_{OUT} = Q_g \times F$$

(2)

To prevent noise problems, bypass VCC to GND with a 0.1-μF ceramic capacitor in parallel as close to the VCC pin as possible. An electrolytic capacitor can also be used in addition to the ceramic capacitor.

APPLICATION INFORMATION

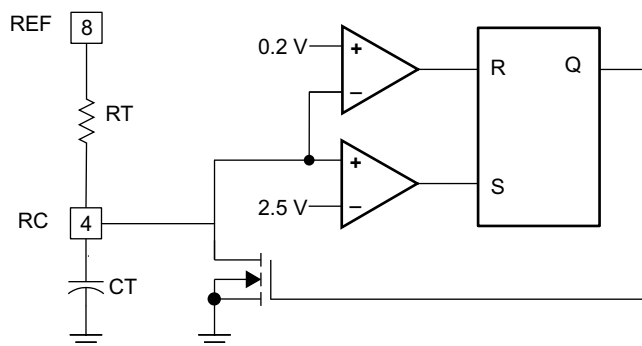


Figure 1. Oscillator

The UCC3813-0/-1/-2/-3/-4/-5 oscillator generates a sawtooth waveform on RC. The rise time is set by the time constant of R_T and C_T . The fall time is set by C_T and an internal transistor on-resistance of approximately $125\ \Omega$. During the fall time, the output is off and the maximum duty cycle is reduced below 50% or 100% depending on the part number. Larger timing capacitors increase the discharge time and reduce the maximum duty cycle and frequency.

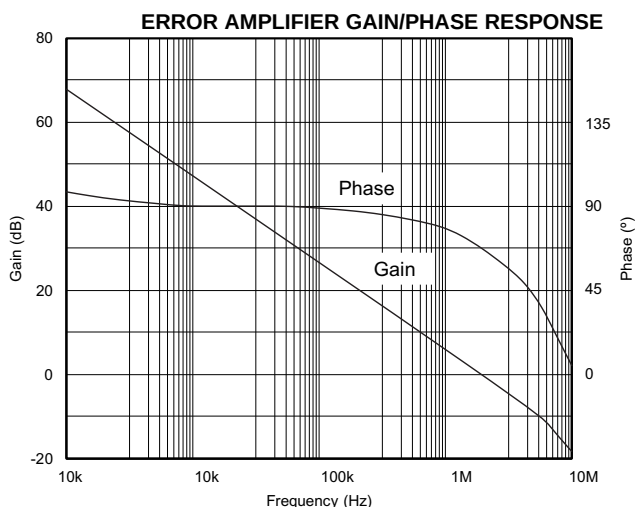


Figure 2.

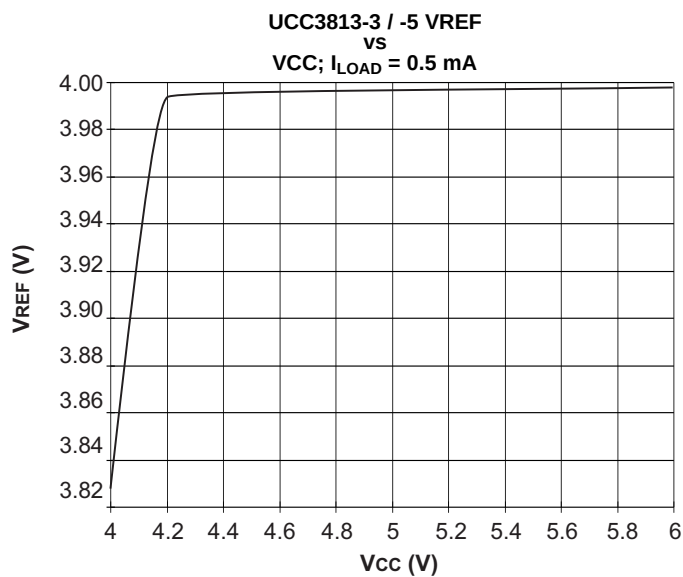
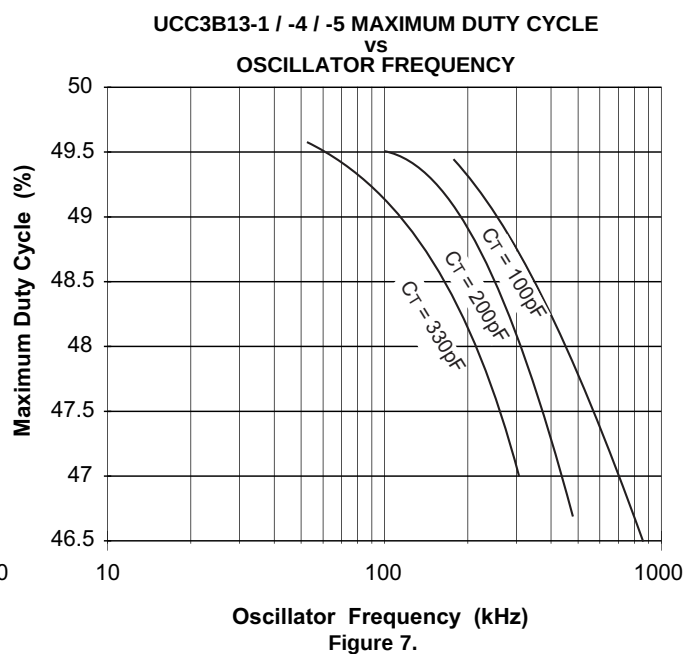
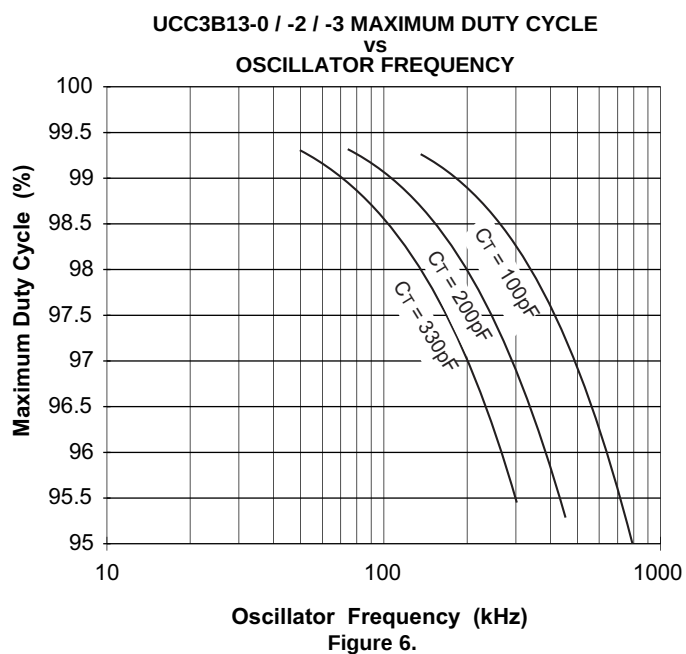
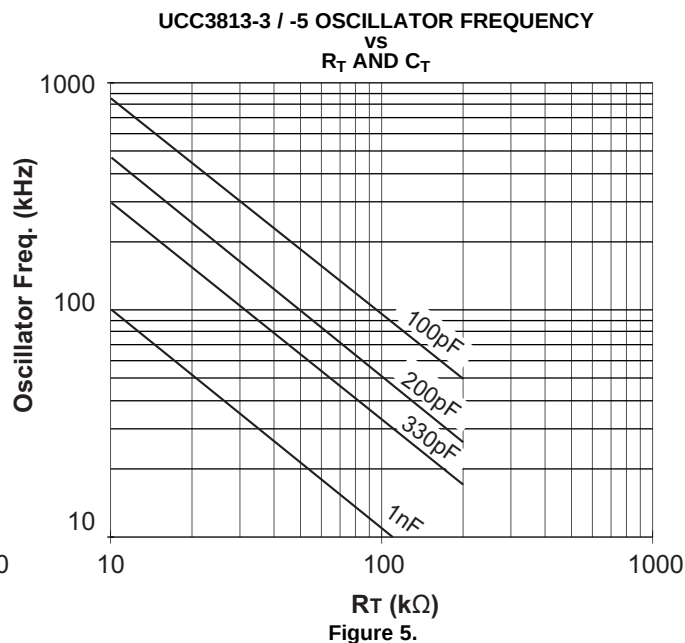
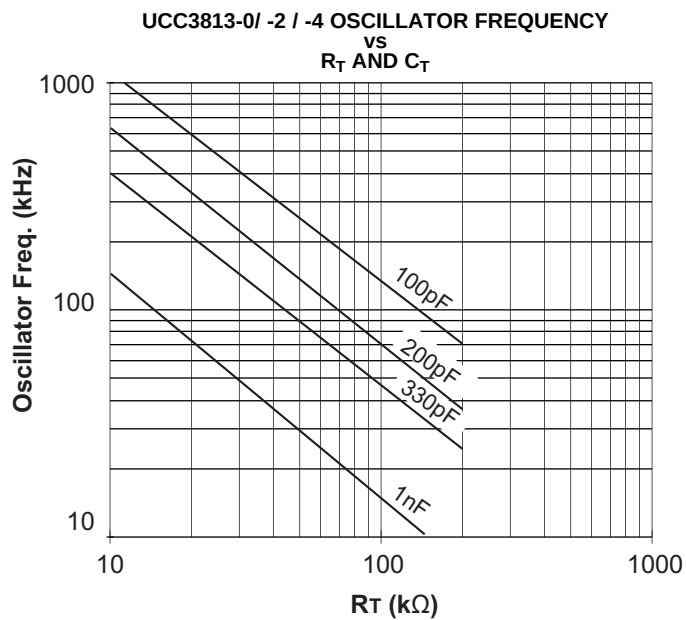
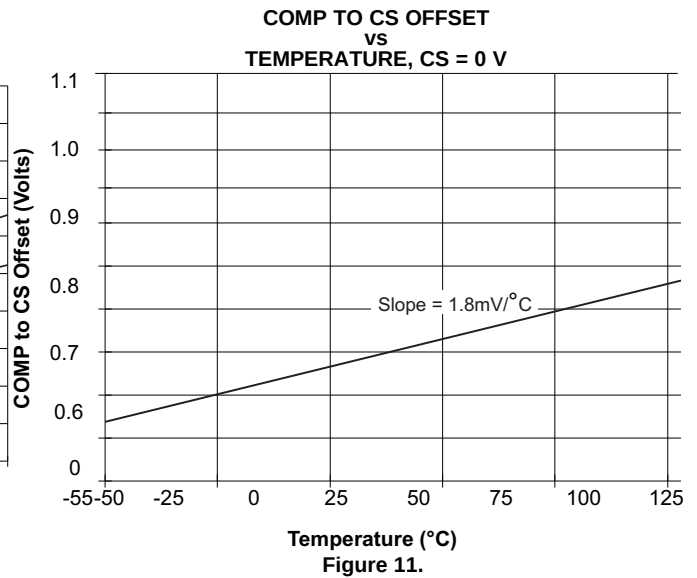
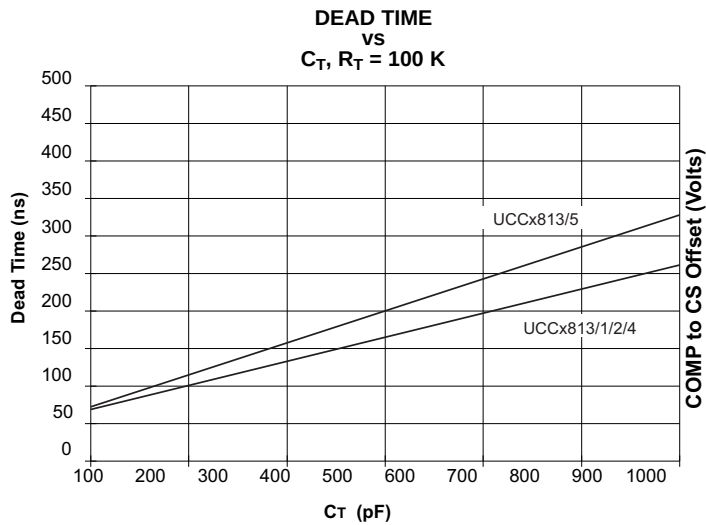
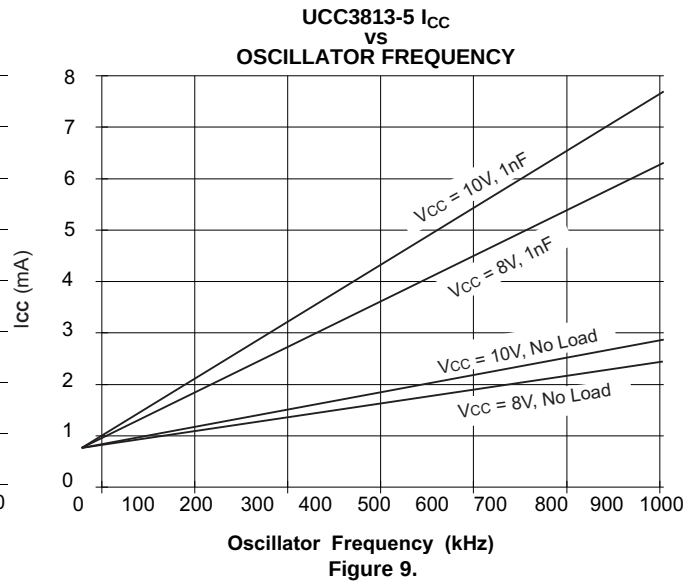
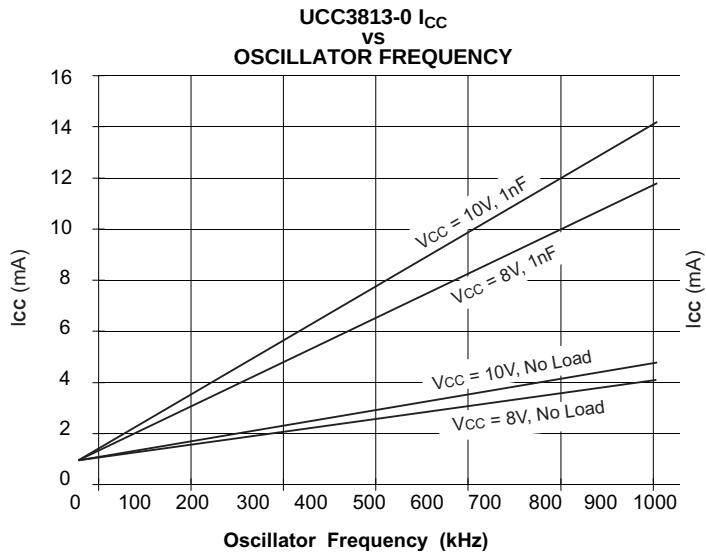


Figure 3.





REVISION HISTORY

Changes from Revision B (April 2008) to Revision C Page

- Added Analog inputs RC and COMP in the *ABSOLUTE MAXIMUM RATINGS* Table [2](#)
- Added clarification to Analog Inputs min-max range in the *ABSOLUTE MAXIMUM RATINGS* table [2](#)

Changes from Revision C (August 2010) to Revision D Page

- Added temperature range table note to second part of ordering information table for clarity in new datasheet format [2](#)
- Added TI's general Absolute Maximum Ratings table note to end of *ABSOLUTE MAXIMUM RATINGS* table [2](#)
- Added Thermal Information Table. [2](#)
- Added UCCX813-3 to Total variation test condition line containing UCCx813-5 in *ELECTRICAL CHARACTERISTICS* table [3](#)
- Changed part numbers in Dead Time vs C_T , $R_T = 100\text{ k}$ graph in *APPLICATION INFORMATION* [9](#)
- Changed layout from Unitrode Products datasheet to TI datasheet [9](#)

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UCC2813D-0	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-0 2813D-0	Samples
UCC2813D-0G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-0 2813D-0	Samples
UCC2813D-1	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-1 2813D-1	Samples
UCC2813D-1G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-1 2813D-1	Samples
UCC2813D-2	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-2 2813D-2	Samples
UCC2813D-2G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-2 2813D-2	Samples
UCC2813D-3	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-3 2813D-3	Samples
UCC2813D-3G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-3 2813D-3	Samples
UCC2813D-4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-4 2813D-4	Samples
UCC2813D-4G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-4 2813D-4	Samples
UCC2813D-5	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-5 2813D-5	Samples
UCC2813D-5G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-5 2813D-5	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UCC2813DTR-0	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-0 2813D-0	Samples
UCC2813DTR-0G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-0 2813D-0	Samples
UCC2813DTR-1	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-1 2813D-1	Samples
UCC2813DTR-1G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-1 2813D-1	Samples
UCC2813DTR-2	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-2 2813D-2	Samples
UCC2813DTR-2G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-2 2813D-2	Samples
UCC2813DTR-3	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-3 2813D-3	Samples
UCC2813DTR-3G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-3 2813D-3	Samples
UCC2813DTR-4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-4 2813D-4	Samples
UCC2813DTR-4G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-4 2813D-4	Samples
UCC2813DTR-5	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-5 2813D-5	Samples
UCC2813DTR-5G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	UCC2813 D-5 2813D-5	Samples
UCC2813N-0	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-0	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UCC2813N-0G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-0	Samples
UCC2813N-1	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-1	Samples
UCC2813N-2	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-2	Samples
UCC2813N-3	ACTIVE		UTR			TBD	Call TI	Call TI			Samples
UCC2813N-4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-4	Samples
UCC2813N-4G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-4	Samples
UCC2813N-5	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	-40 to 85	UCC2813N-5	Samples
UCC2813PW-0	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28130	Samples
UCC2813PW-0G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28130	Samples
UCC2813PW-1	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28131	Samples
UCC2813PW-1G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28131	Samples
UCC2813PW-2	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28132	Samples
UCC2813PW-3	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28133	Samples
UCC2813PW-3G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28133	Samples
UCC2813PW-4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28134	Samples
UCC2813PW-5	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28135	Samples
UCC2813PW-5G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28135	Samples
UCC2813PWTR-0	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28130	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UCC2813PWTR-0G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28130	Samples
UCC2813PWTR-1	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28131	Samples
UCC2813PWTR-3	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28133	Samples
UCC2813PWTR-3G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28133	Samples
UCC2813PWTR-4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28134	Samples
UCC2813PWTR-4G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28134	Samples
UCC2813PWTR-5	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28135	Samples
UCC2813PWTR-5G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-40 to 85	28135	Samples
UCC3813D-0	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-0 3813D-0	Samples
UCC3813D-0G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-0 3813D-0	Samples
UCC3813D-1	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-1 3813D-1	Samples
UCC3813D-1G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-1 3813D-1	Samples
UCC3813D-2	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-2 3813D-2	Samples
UCC3813D-2G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-2 3813D-2	Samples
UCC3813D-3	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-3 3813D-3	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UCC3813D-3G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-3 3813D-3	Samples
UCC3813D-4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-4 3813D-4	Samples
UCC3813D-4G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-4 3813D-4	Samples
UCC3813D-5	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-5 3813D-5	Samples
UCC3813D-5G4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-5 3813D-5	Samples
UCC3813DTR-0	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-0 3813D-0	Samples
UCC3813DTR-0G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-0 3813D-0	Samples
UCC3813DTR-1	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-1 3813D-1	Samples
UCC3813DTR-1G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-1 3813D-1	Samples
UCC3813DTR-2	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-2 3813D-2	Samples
UCC3813DTR-3	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-3 3813D-3	Samples
UCC3813DTR-3G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-3 3813D-3	Samples
UCC3813DTR-4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-4	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
										3813D-4	
UCC3813DTR-4G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-4 3813D-4	Samples
UCC3813DTR-5	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-5 3813D-5	Samples
UCC3813DTR-5G4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	UCC3813 D-5 3813D-5	Samples
UCC3813N-0	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-0	Samples
UCC3813N-0G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-0	Samples
UCC3813N-1	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-1	Samples
UCC3813N-1G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-1	Samples
UCC3813N-2	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-2	Samples
UCC3813N-2G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-2	Samples
UCC3813N-3	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-3	Samples
UCC3813N-3G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-3	Samples
UCC3813N-4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-4	Samples
UCC3813N-4G4	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-4	Samples
UCC3813N-5	ACTIVE	PDIP	P	8	50	Green (RoHS & no Sb/Br)	CU NIPDAU	N / A for Pkg Type	0 to 70	UCC3813N-5	Samples
UCC3813PW-0	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38130	Samples
UCC3813PW-1	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38131	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UCC3813PW-2	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38132	Samples
UCC3813PW-3	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38133	Samples
UCC3813PW-3G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38133	Samples
UCC3813PW-4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38134	Samples
UCC3813PW-4G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38134	Samples
UCC3813PW-5	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38135	Samples
UCC3813PW-5G4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38135	Samples
UCC3813PWTR-0	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38130	Samples
UCC3813PWTR-0G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38130	Samples
UCC3813PWTR-1	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38131	Samples
UCC3813PWTR-3	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38133	Samples
UCC3813PWTR-3G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38133	Samples
UCC3813PWTR-5	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38135	Samples
UCC3813PWTR-5G4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 70	38135	Samples

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

⁽⁴⁾ There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

⁽⁵⁾ Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

OTHER QUALIFIED VERSIONS OF UCC2813-0, UCC2813-1, UCC2813-2, UCC2813-3, UCC2813-4, UCC2813-5 :

- Automotive: [UCC2813-0-Q1](#), [UCC2813-1-Q1](#), [UCC2813-2-Q1](#), [UCC2813-3-Q1](#), [UCC2813-4-Q1](#), [UCC2813-5-Q1](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

TAPE AND REEL INFORMATION


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
UCC2813DTR-0	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC2813DTR-1	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC2813DTR-2	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC2813DTR-3	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC2813DTR-4	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC2813DTR-5	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC2813PWTR-4	TSSOP	PW	8	2000	330.0	12.4	7.0	3.6	1.6	8.0	12.0	Q1
UCC3813DTR-0	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC3813DTR-1	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC3813DTR-2	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC3813DTR-3	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC3813DTR-4	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
UCC3813DTR-5	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
UCC2813DTR-0	SOIC	D	8	2500	340.5	338.1	20.6
UCC2813DTR-1	SOIC	D	8	2500	340.5	338.1	20.6
UCC2813DTR-2	SOIC	D	8	2500	340.5	338.1	20.6
UCC2813DTR-3	SOIC	D	8	2500	340.5	338.1	20.6
UCC2813DTR-4	SOIC	D	8	2500	340.5	338.1	20.6
UCC2813DTR-5	SOIC	D	8	2500	340.5	338.1	20.6
UCC2813PWTR-4	TSSOP	PW	8	2000	367.0	367.0	35.0
UCC3813DTR-0	SOIC	D	8	2500	340.5	338.1	20.6
UCC3813DTR-1	SOIC	D	8	2500	340.5	338.1	20.6
UCC3813DTR-2	SOIC	D	8	2500	340.5	338.1	20.6
UCC3813DTR-3	SOIC	D	8	2500	340.5	338.1	20.6
UCC3813DTR-4	SOIC	D	8	2500	340.5	338.1	20.6
UCC3813DTR-5	SOIC	D	8	2500	340.5	338.1	20.6

P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Falls within JEDEC MS-001 variation BA.

D (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - $\triangle C$ Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
 - $\triangle D$ Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AA.

D (R-PDSO-G8)

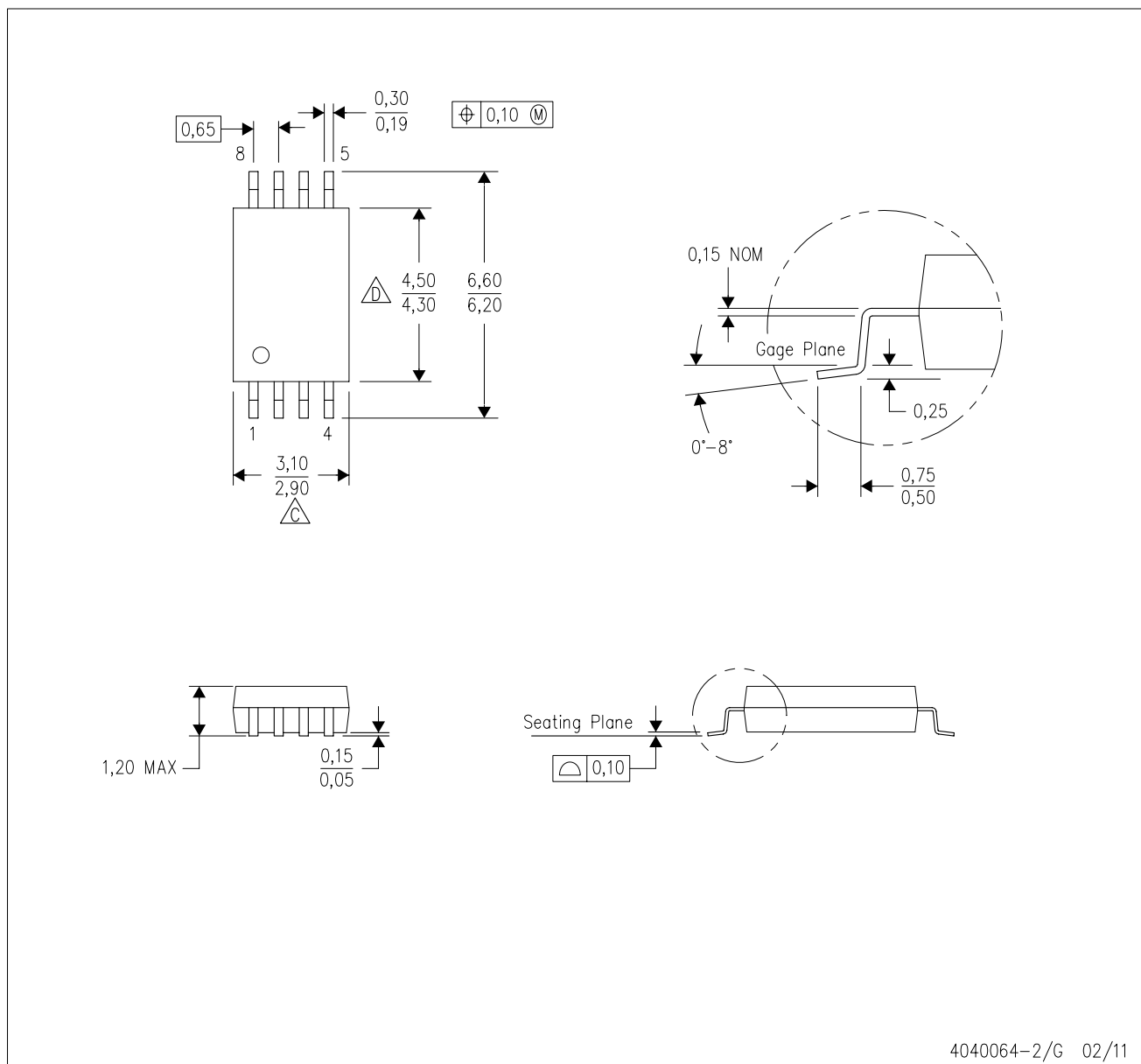
PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Publication IPC-7351 is recommended for alternate designs.
 - D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 - E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

PW (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
 - E. Falls within JEDEC MO-153

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com