



**THE DATASHEET OF
BCR430UW6-7**



Description

The BCR430U is a monolithically integrated linear LED controller designed to function as a Constant Current Regulator (CCR) for linear LED driving. The device operates over a voltage range of 5V to 42V and regulates the output LED current up to 100mA, set by an external resistor. It is designed for driving LEDs in strings and will reduce current at increasing temperatures to self-protect. The low voltage drop during current regulation allows efficient driving of LED strings with a range of forward voltages and supply voltage tolerances.

Features

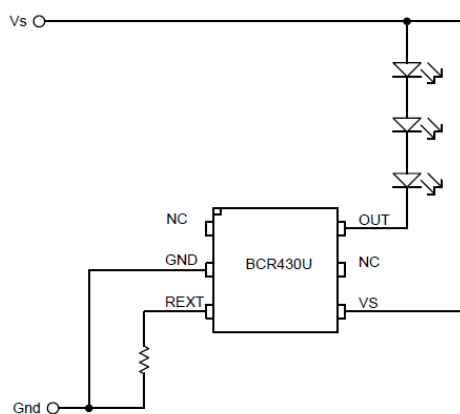
- LED Current Tolerance of $\pm 5\%$ at 95mA Output Current
- Thermal Protection Reduces LED Current at Elevated Temperature
- Low Typical Saturation Voltage of 115mV at 50mA
- 5mA to 100mA Adjustable LED Current with an External Resistor
- 5V to 42V Supply Voltage
- High Power 1W Dissipation in SOT26
- No External Capacitors Required for Stable Operation
- LED Dimming Using PWM
- Parallel Devices to Increase Regulated Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([BCR430UW6Q](#))**

Applications

- LED strips
- LED panel displays
- Architectural and landscape lighting
- Mood and decorative lighting
- Retail lighting

Mechanical Data

- Package: SOT26
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208
- Weight: 0.018 grams (Approximate)



Typical Configuration



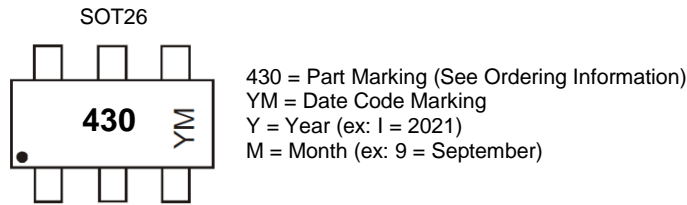
SOT26

Ordering Information (Note 4)

Product	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
BCR430UW6-7	430	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

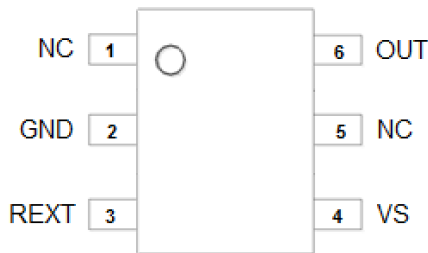
Marking Information



Date Code Key

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	G	H	I	J	K	L	M	N	O	P	R	S
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

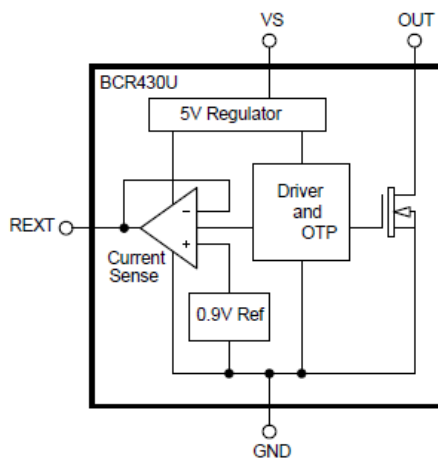
Pinout Diagram



Pin Description

Pin Number	Pin Name	Function
1	NC	Not Connected
2	GND	Power Ground
3	REXT	External Resistor for Adjusting Output Current
4	VS	Supply Voltage
5	NC	Not Connected
6	OUT	I_{OUT} - Regulated Output Current

Functional Block Diagram



Absolute Maximum Ratings (Voltage relative to GND, @ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_S	-0.5	45	V
Output Current	I_{OUT}	0	100	mA
Output Voltage	V_{OUT}	-0.5	42	V
R_{EXT} Current	I_{REXT}	0	0.3	mA
R_{EXT} Voltage	V_{REXT}	-0.5	5	V

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_S	5	42	V
OUT Pin Voltage Range	V_{OUT}	0.5	40	V
Output Current (Note 5)	I_{OUT}	5	100	mA
Ambient Temperature Range (Notes 5 & 6)	T_A	-40	+125	$^\circ\text{C}$
Normal Operation Junction Temperature Range (Note 6)	T_J	-40	+125	$^\circ\text{C}$

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	(Note 7)	735	mW
	(Note 8)	793	
Thermal Resistance, Junction to Ambient	(Note 7)	136	$^\circ\text{C/W}$
	(Note 8)	126	
Thermal Resistance, Junction to Lead	(Note 9)	88.5	
Operating Junction Temperature	T_J	-40 to +125	$^\circ\text{C}$
Recommended Storage Temperature	T_S	-55 to +165	$^\circ\text{C}$

ESD Ratings (Note 10)

Characteristics	Symbols	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	HBM	2000	V	2
Charge Device Model	CDM	1000	V	C5

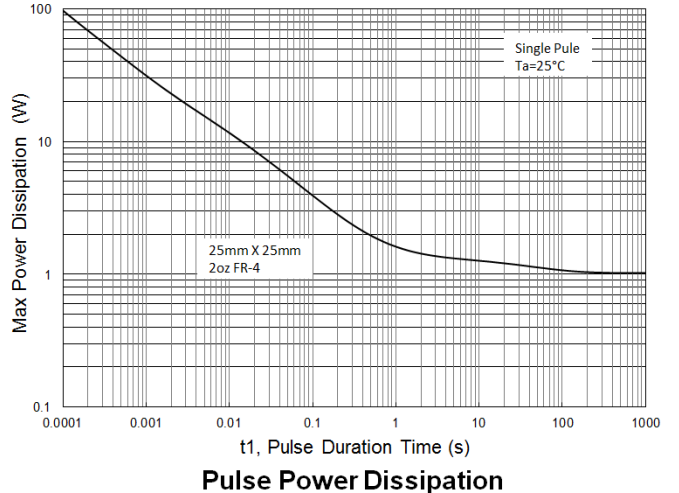
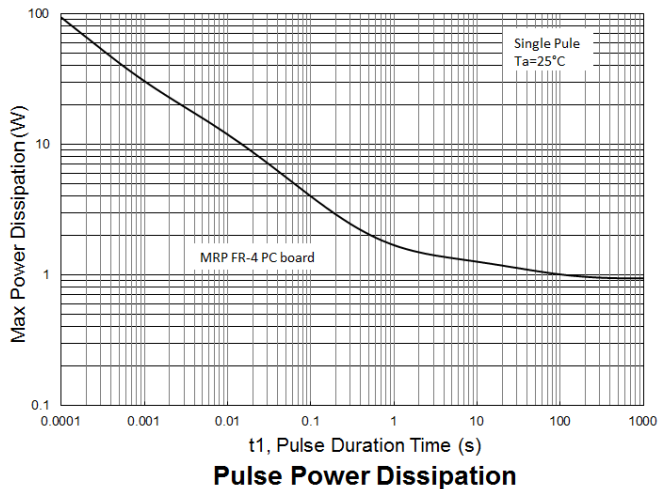
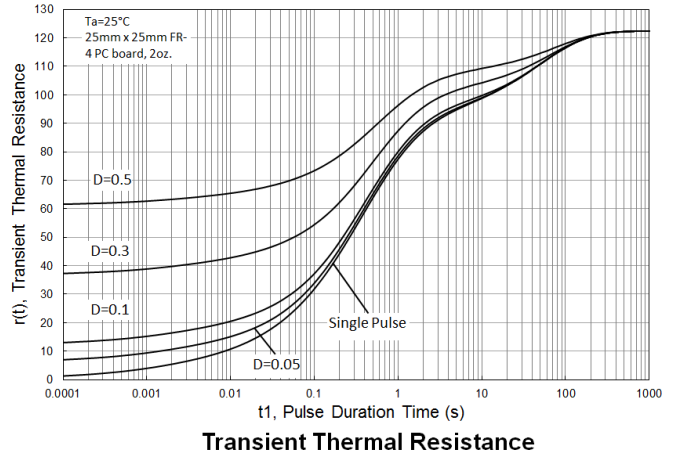
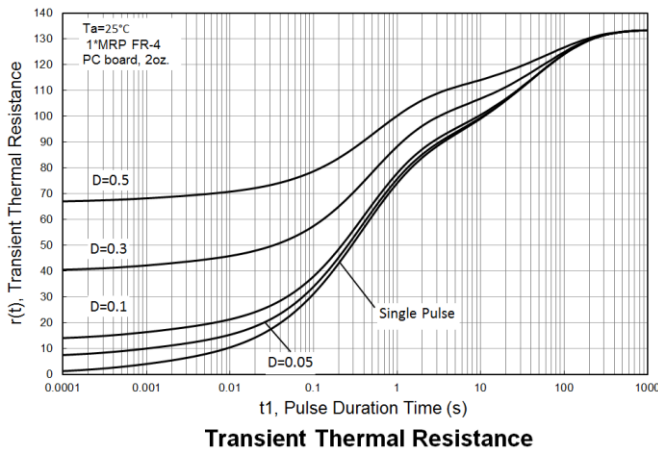
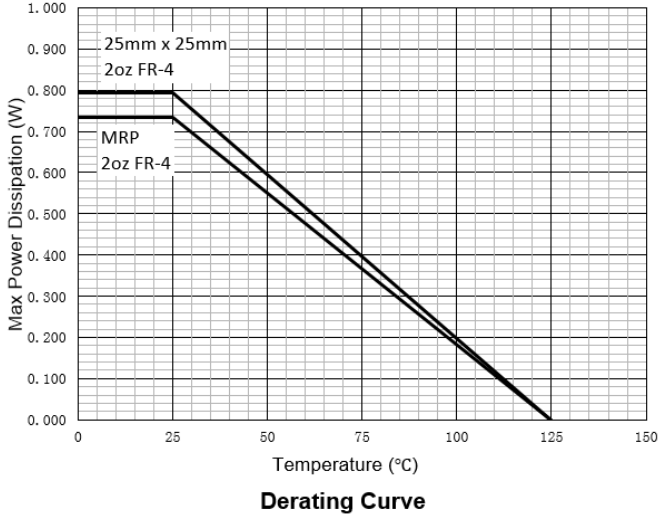
- Notes:
- Subject to the device junction temperature not exceeding the onset point of Over Temperature Protection (OTP) operation. The OTP operation typically starts at $+125^\circ\text{C}$, but can start as low as $+100^\circ\text{C}$ or as high as $+140^\circ\text{C}$.
 - A typical device will operate at its defined output current (set by R_{EXT}) up to a junction temperature of $+125^\circ\text{C}$. However, if the combination of power dissipation and ambient temperature drives T_J above $+125^\circ$, the output current will be reduced linearly with temperature, reaching zero output current at $+150^\circ\text{C}$.
 - For a device mounted on MRP FR4-PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Same as Note 7, except the device is mounted on $25\text{mm} \times 25\text{mm}$ 2oz copper.
 - $R_{\theta JL}$ = Thermal resistance from junction to solder-point (at the end of the OUT leads).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

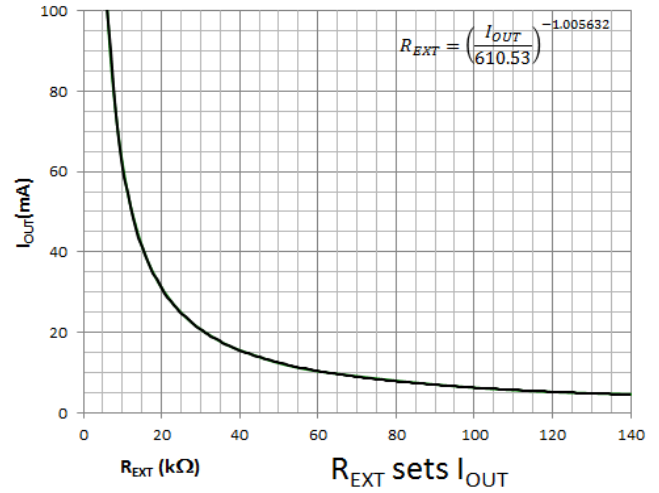
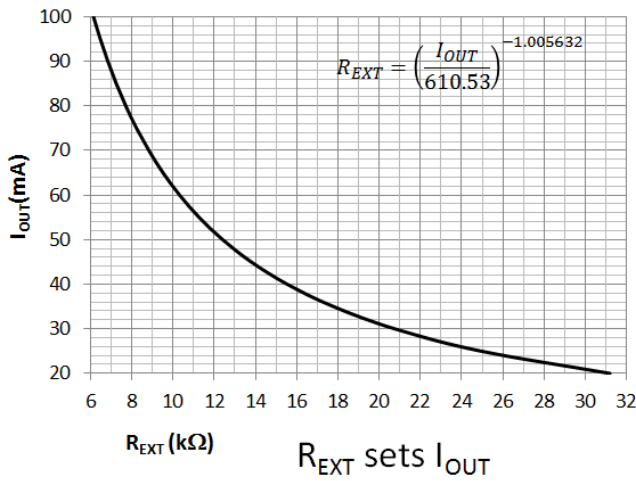
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Supply Voltage	V _S	5	—	42	V	—
Supply Current (Note 11)	I _S	180	261	400	μA	I _{OUT} = 50mA, V _S = 5V
		—	285	500	μA	I _{OUT} = 50mA, V _S = 42V
Quiescent Current	I _Q	40	67	100	μA	V _S = 42V; R _{EXT} = open
Output Current range	I _{OUT}	5	—	100	mA	—
Output Current, set by R _{EXT} (Note 11)	I _{OUT}	18	20.8	22.7	mA	R _{EXT} = 30kΩ
		45.7	49.1	52.3	mA	R _{EXT} = 12.7kΩ
		90	95.3	100	mA	R _{EXT} = 6.49kΩ
Driver Voltage Drop (Note 11)	V _{OUT-MIN}	50	115	200	mV	I _{OUT} = 50mA
		0.880	0.903	0.960	V	R _{EXT} = 300kΩ
REXT Pin Voltage (Note 11)	V _{REXT}	0.875	0.892	0.955	V	R _{EXT} = 6.49kΩ
Thermal Knee Junction Temperature (Note 12)	T _K	—	+125	—	°C	—
Output Current Change vs. Temperature	(ΔI _{OUT} /I _{OUT})/ΔT _J	—	0.0032	—	%/°C	T _J > -40°C; T _J = +120°C; I _{OUT} = 50mA
Output Current Change vs. Supply Voltage or Output Voltage	(ΔI _{OUT} /I _{OUT})/ΔV	—	0.0055	—	%/V	I _{OUT} = 50mA; 5V < V _S < 42V or 1V < V _{OUT} < 40V

- Notes:
11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.
 12. Thermal Knee Junction Temperature is defined as the asymptotic intersection of the +25°C temperature I_{OUT} current and the I_{OUT} current in overtemperature protection mode.

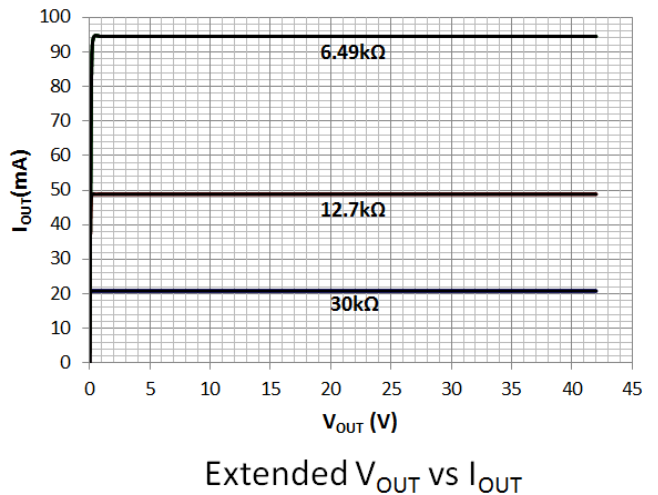
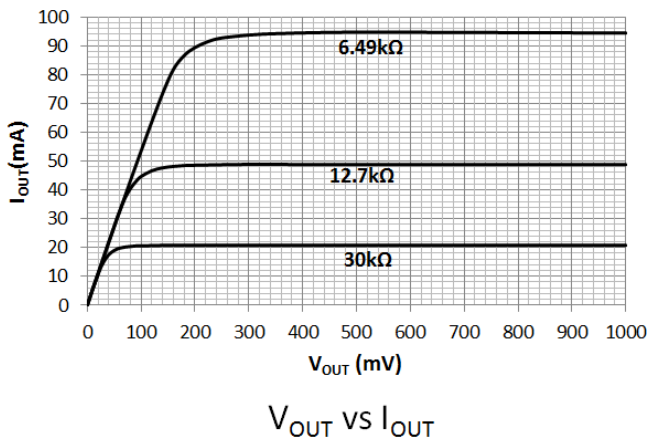
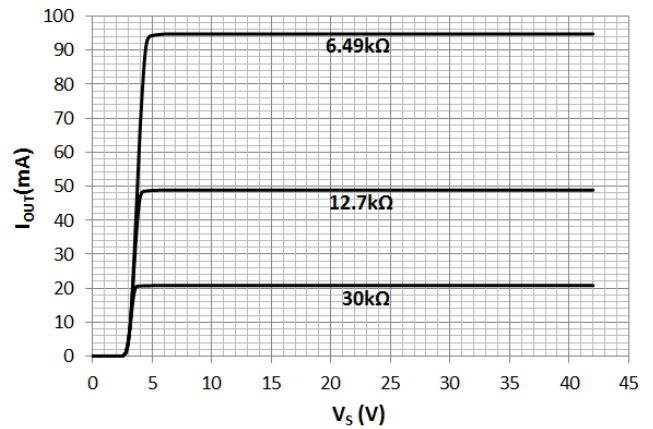
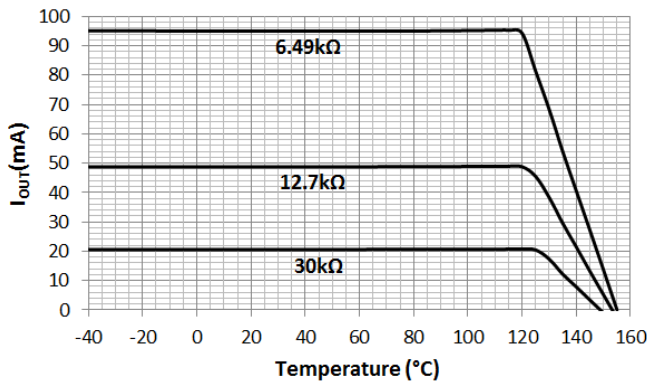
Typical Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Typical Electrical Characteristics (continued) (@ T_A = +25°C, unless otherwise specified.)

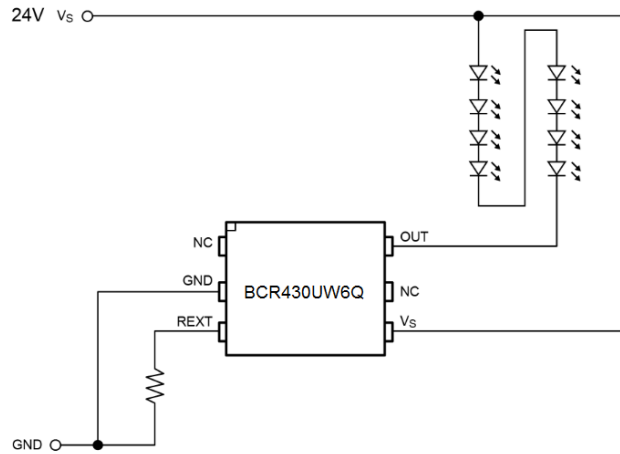


The LED current is set according to the resistor value which is connected to the REXT pin.



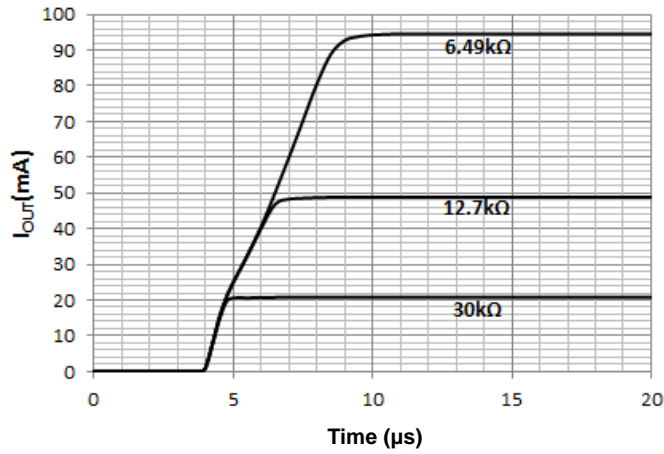
Application Information

Typical Application Circuit

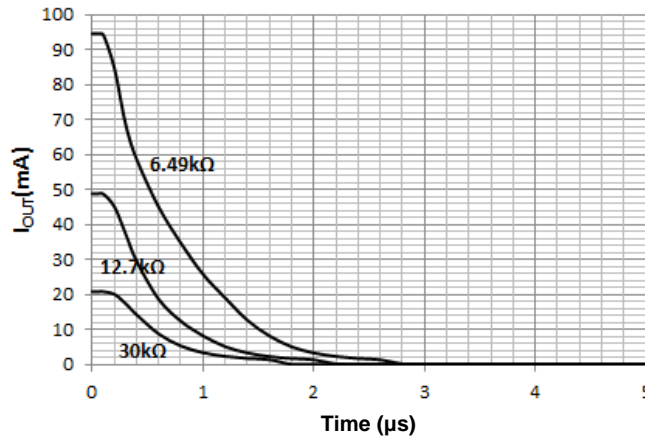


No external capacitors required for stable operation. Suitable for dimming with VS or REXT pin modulation.

Switching / Timing Information (@ $V_S = 10V$, $V_{OUT} = 1V$, 1kHz, 50% Mark-Space ratio, R_{EXT} modulation.)



For $R_{EXT} = 6.49k\Omega$, $t_R = 14\mu s$ at $-40^\circ C$, $9\mu s$ at $+25^\circ C$ and $7\mu s$ at $+110^\circ C$.
Rise time does not change significantly with LED loads (delay increases by less than $2\mu s$).

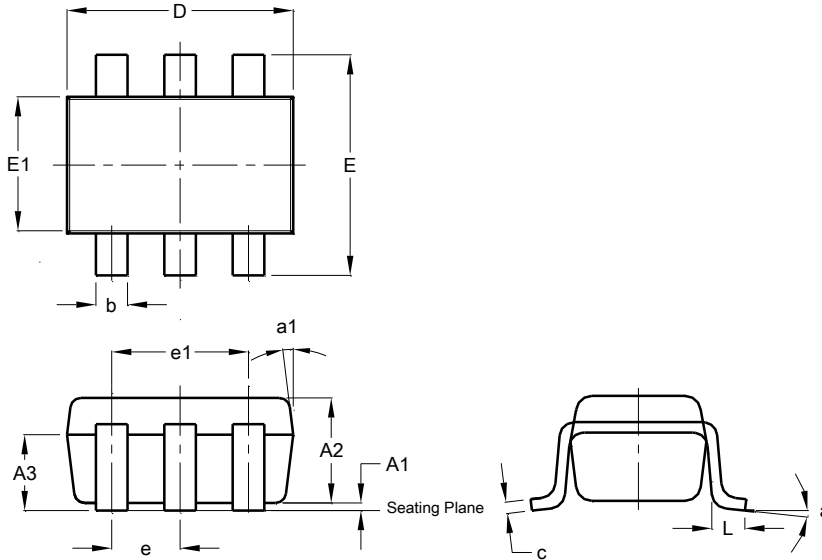


Fall time is independent of temperature.
Fall time does not change significantly with LED loads.

Package Outline Dimensions

Please see <https://www.diodes.com/package-outlines.html> for the latest version.

SOT26

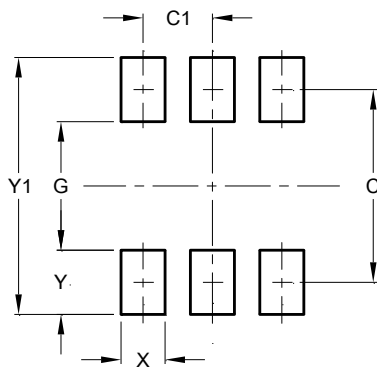


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

Please see <https://www.diodes.com/package-outlines.html> for the latest version.

SOT26



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

IMPORTANT NOTICE



1. DIODES INCORPORATED AND ITS SUBSIDIARIES ("DIODES") MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).
2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes products. Diodes products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of the Diodes products for their intended applications, (c) ensuring their applications, which incorporate Diodes products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.
3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.
4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.
5. Diodes products are provided subject to Diodes' Standard Terms and Conditions of Sale (<https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/>) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.
6. Diodes products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.
7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.
8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

Copyright © 2022 Diodes Incorporated


www.diodes.com

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View BCR430UW6-7 on WIN SOURCE](#)
-  [Diodes Incorporated Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management