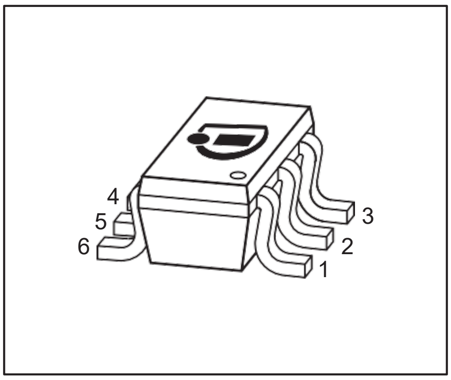


英飞凌 LED 驱动器

特性

• LED 驱动电流为 50mA
• 通过外接电阻器，输出电流最高可调至 65mA
• 电源电压高达 40V
• 轻松并联驱动器以增加电流
• 1.4V 的低电压开销
• 电源电压变化时电流精度高
• 无 EMI
• 750mW 的高功率耗散能力
• 输出电流随温度升高而降低 - 负温度系数为 -0.2% / K
• 符合 RoHS 规范（无铅），小巧且坚固的 SC-74 封装
• 符合 AEC-Q101 标准

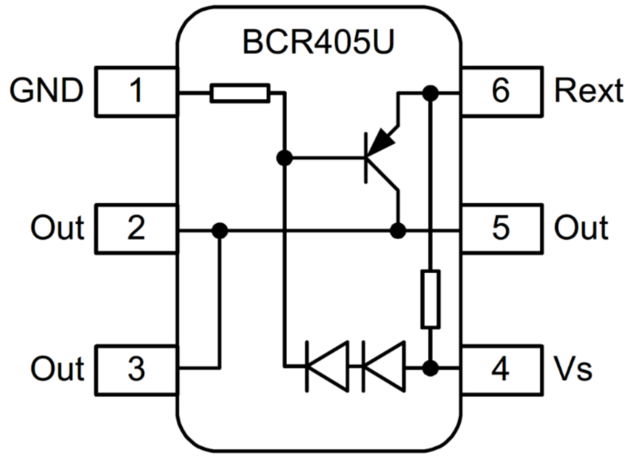
应用

• 用于广告的槽形字母、用于装饰照明的 LED 灯带
• 飞机、火车、轮船照明
• 改造普通照明、冰箱照明等白色家电
• 医疗照明
• 汽车应用，如 CHMSL 和后组合灯

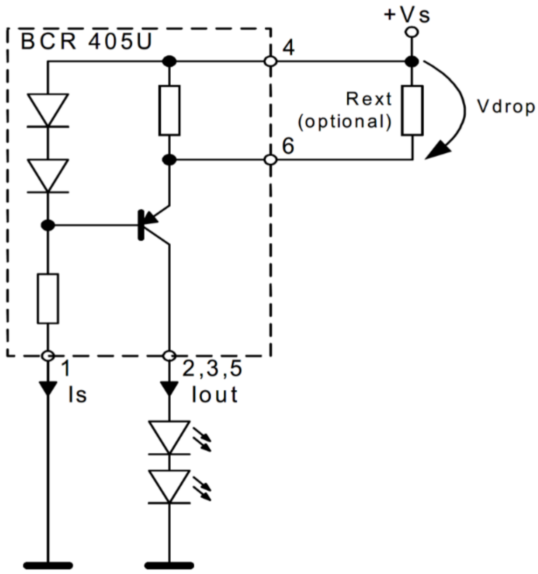
描述

BCR405U 是一款用于驱动低功率 LED 的高性价比 LED 驱动器。电阻偏压的优势在于：
• 尽管不同 LED 灯串的正向电压不同，但仍能实现均匀的光输出
• 尽管在长电源线上存在电压降，但 LED 的光输出依然均匀
• 光输出均匀，不受电源电压变化的影响
• 由于在较高温度下输出电流会减少（负温度系数），LED 的使用寿命更长
离散解决方案的优势在于：
• 降低装配成本
• 最小的外形尺寸
• 焊接点少，质量更好
• 经过预测试的 LED 驱动器可实现更高的输出电流精度
通过在接地引脚上使用外部数字晶体管，可以实现调光。
将 LED 放在电源 +VS 和 LED 驱动器的电源引脚之间，英飞凌 BCR405U 就能在更高的电源电压下工作。更多详情，请参阅应用说明 AN097。
BCR405U 外形小巧，成本低廉，非常适合众多低功耗 LED 应用。与电阻器相比，这些 LED 驱动器具有多项优势，例如在压降极低的情况下，电流控制能力显著提高，从而确保 LED 的高使用寿命。

引脚配置



典型应用



Type	Marking	Pin Configuration				Package
BCR405U	L5s	1 = GND	2;3;5 = I_{out}	4 = V_S	6 = R_{ext}	SC74

Maximum Ratings

Parameter	Symbol	Value	Unit
Supply voltage	V_S	40	V
Output current	I_{out}	65	mA
Output voltage	V_{out}	38	V
Reverse voltage between all terminals	V_R	0.5	
Total power dissipation, $T_S \leq 125$ °C	P_{tot}	750	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

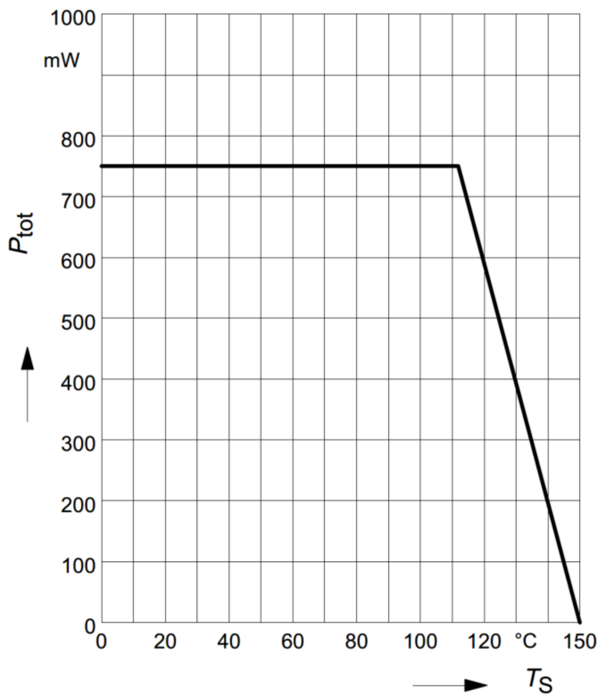
Parameter	Symbol	Value	Unit
Junction - soldering point[1]	R_{thJS}	50	K/W

1 有关 R_{thJA} 的计算，请参阅“应用说明 Thermal Resistance”。

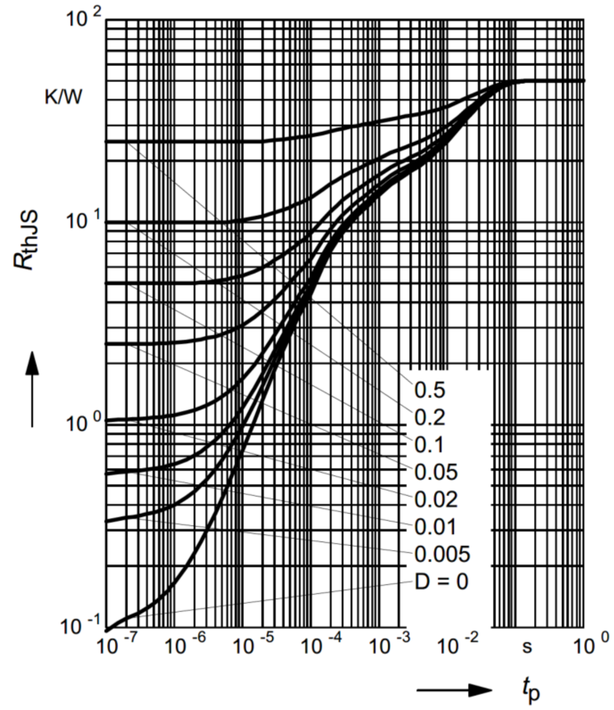
电气特性在 T_A = 25°C 时，除非另有说明

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{BR(CEO)}$	40	-	-	V
Supply current V_S = 10 V	I_S	340	420	500	µA
DC current gain I_C = 50 mA, V_{CE} = 1 V	h_{FE}	100	220	470	-
Internal resistor I_{Rint} = 50 mA	R_{int}	13	17	22	Ω
Output current V_S = 10 V	I_{out}	45	50	55	mA
Voltage drop (V_S - V_E) I_{out} = 50 mA	V_{drop}	0.75	0.8	0.85	V
DC Characteristics with stabilized LED load					
Lowest sufficient battery voltage overhead I_{out} > 18mA	V_{Smin}	-	1.4	-	V
Output current change versus T_A V_S = 10 V	$\Delta I_{out}/I_{out}$	-	-0.15	-	%/K
Output current change versus V_S V_S = 10 V	$\Delta I_{out}/I_{out}$	-	1	-	%/V

Total power dissipation $P_{tot} = f(T_S)$

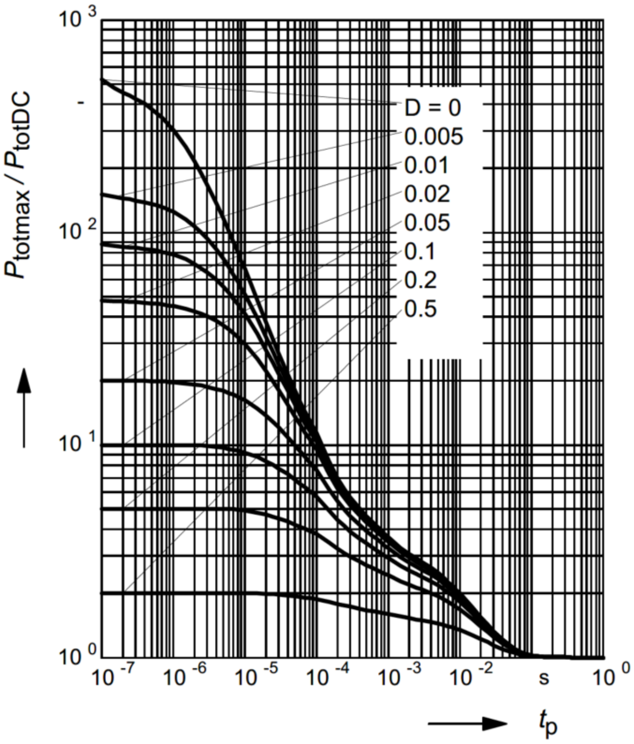


Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

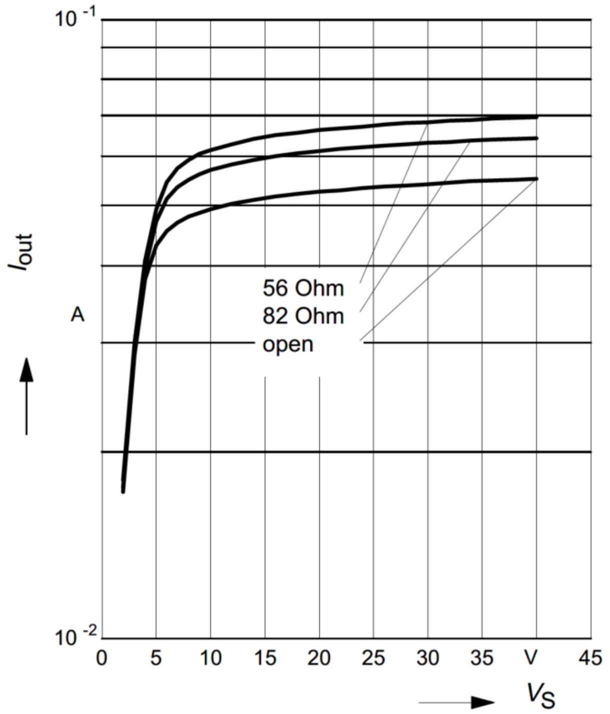
$P_{totmax} / P_{totDC} = f(t_p)$



Output current versus supply voltage

$I_{out} = f(V_S)$; R_{ext} = Parameter

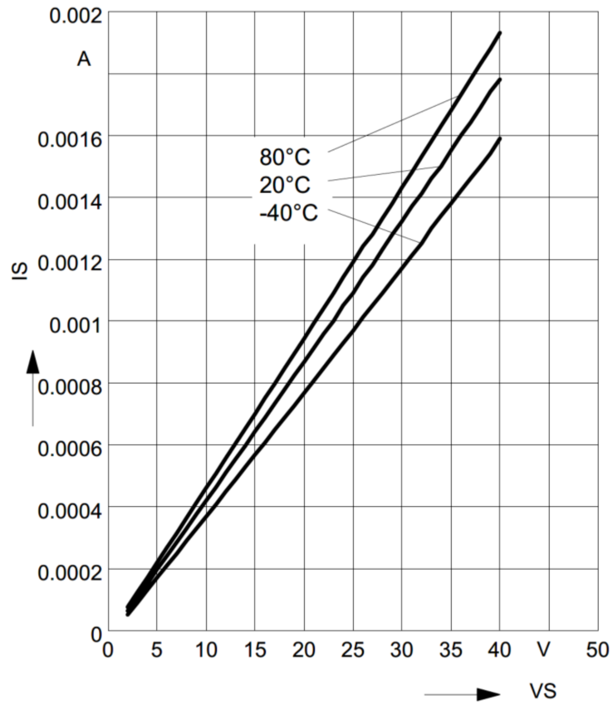
$V_S - V_{out}$ = 1.4 V



Supply current versus supply voltage

$I_S = f(V_S)$

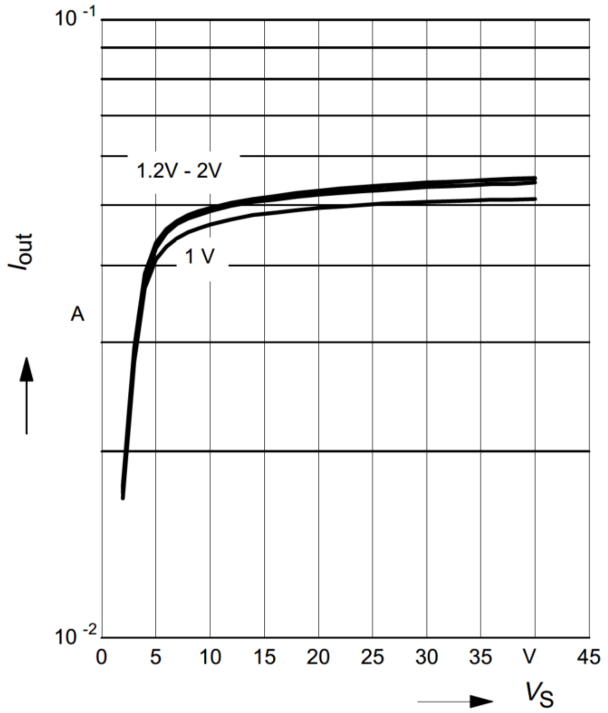
T_A = Parameter



Output current versus supply voltage

$I_{out} = f(V_S)$, T_A = 20°C

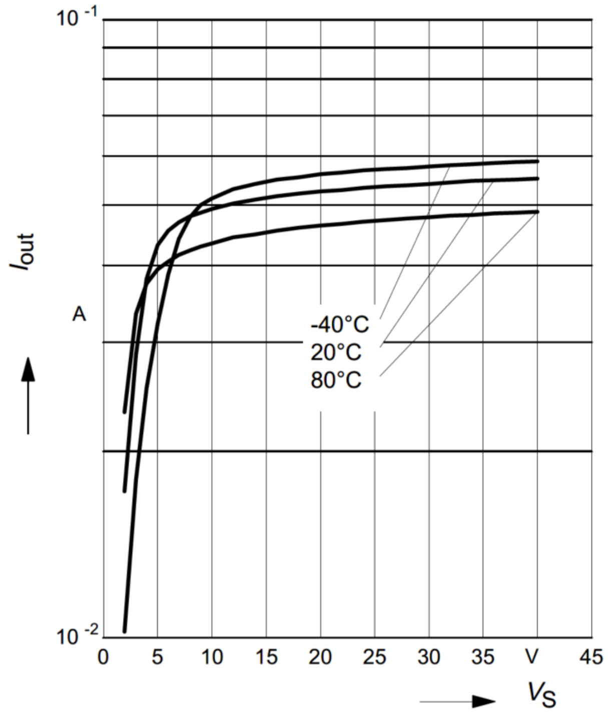
$V_S - V_{out}$ as Parameter



Output current versus supply voltage

$I_{out} = f(V_S)$, $V_S - V_{out}$ = 1.4 V

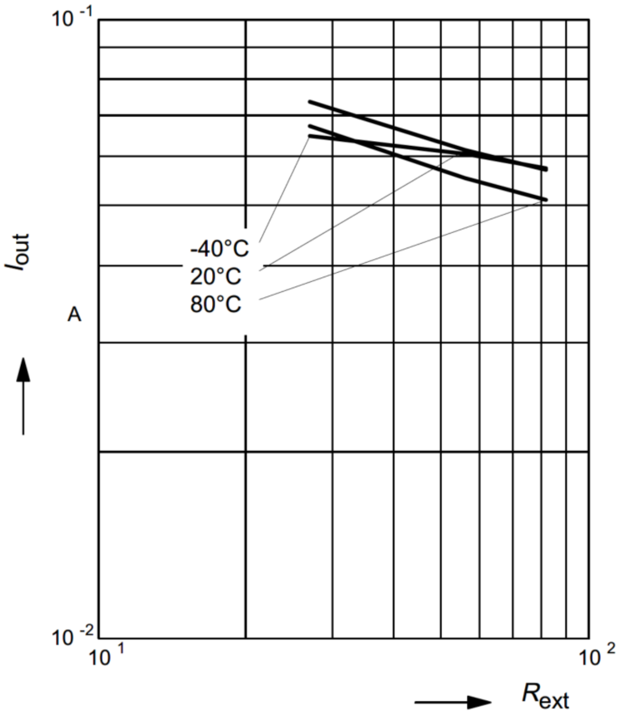
T_A = Parameter



Output current versus external resistor

I_{out} = (R_{ext}), V_S = 10V, V_S - V_{out} = 1.4 V

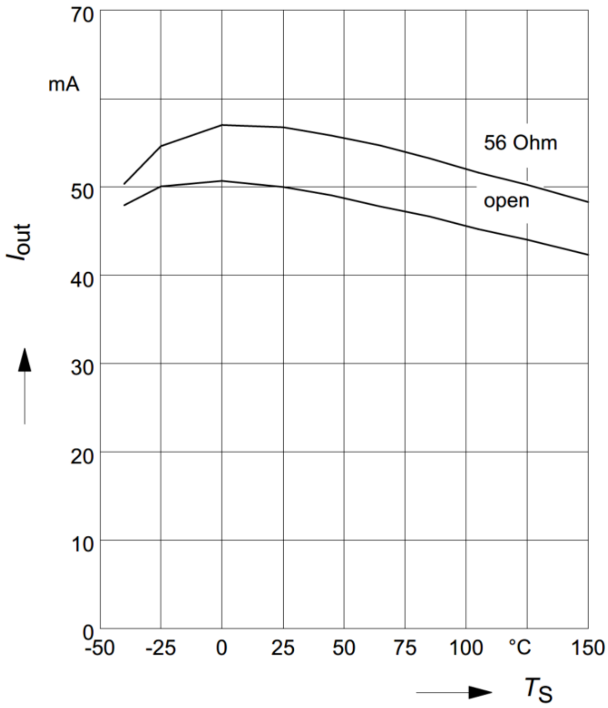
T_A = Parameter



Output current

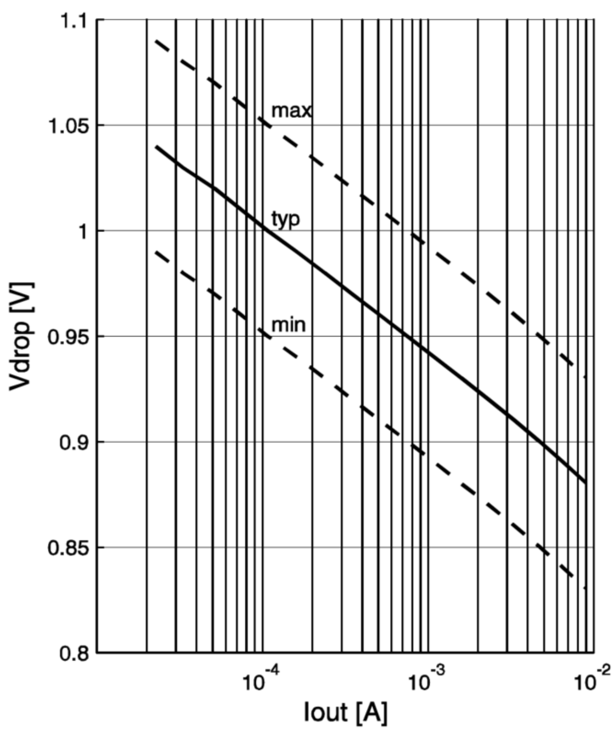
I_{out} (T_S), V_S = 10V, V_S - V_{out} = 1.4 V

R_{EXT} = Parameter



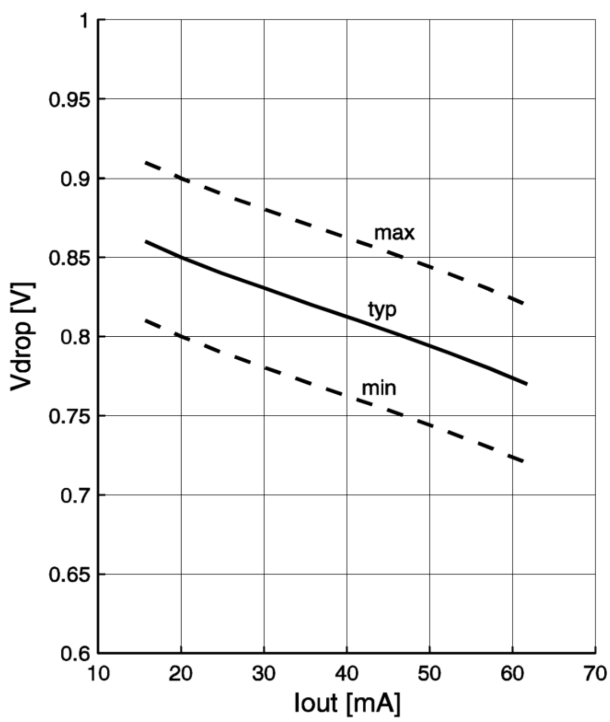
Reference Voltage (Vdrop)

versus I_{out} = 10 µA ... 10 mA

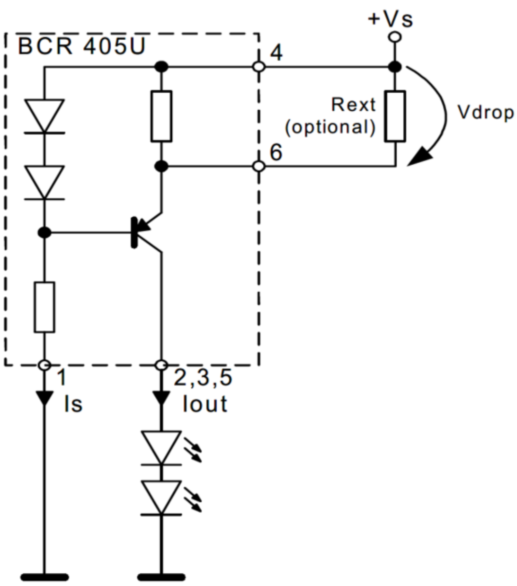


Reference Voltage (Vdrop)

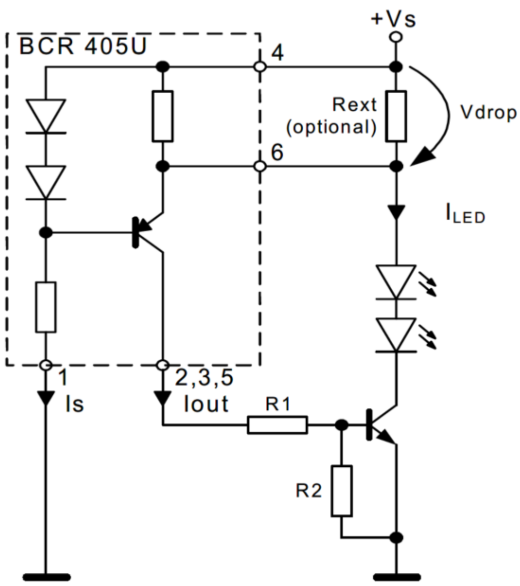
versus I_{out} = 10 mA ... 65 mA



Application circuit:
Stand alone current source



Application circuit:
Boost mode current source with external power transistor

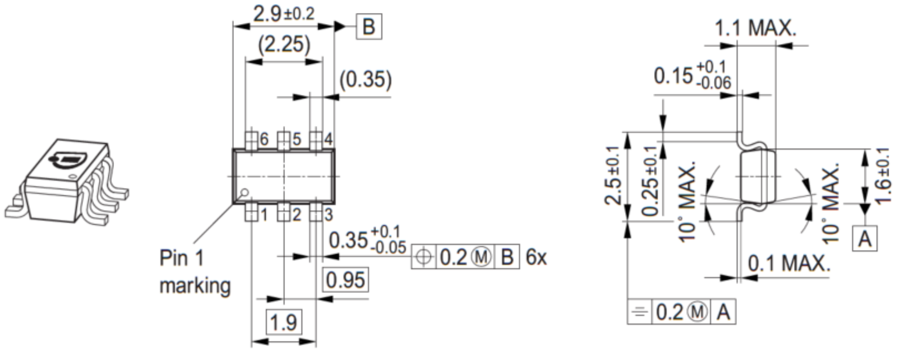


应用提示

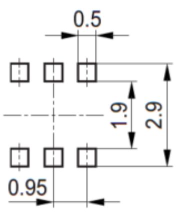
BCR405U 是一种易于使用的 LED 恒流源。在独立应用中，可通过连接一个外部电阻器，将电流调节为 50 mA 至 65 mA。Rext 可通过“Output current versus external resistor”图确定、或参考图表“Reference voltage versus output current”。在 x 轴上查找所需的输出电流，然后读出相应的 Vdrop。计算 Rext：
Rext = Vdrop / (Iout -(Vdrop/Rint))
请注意，由于组件的自热和负热系数，产生的输出电流会略低。

在升压模式配置下，LED 电流可扩展用于驱动更大功率的 LED。根据功率耗散和输出电流要求选择功率晶体管。(例如 BC817SU 或 BCX68-25 等）R2 值，将晶体管电流传输比降至 20 … 50。对于 ILED / Iout = 50，例如 ILED= 350 mA，Iout 为 7 mA。
R2 = VbeON / Iout。
最小电源电压条件下的 R1 值：
R1 = (Vsmin -1.4V -VbeON)/Iout。
有关应用说明，请访问我们的网站：www.infineon.com/lowcostleddriver
- AN077 为热设计提供指导
- AN097 可在电源电压过高时提供帮助
- AN101 概述了 LED 的偏压情况

Package Outline

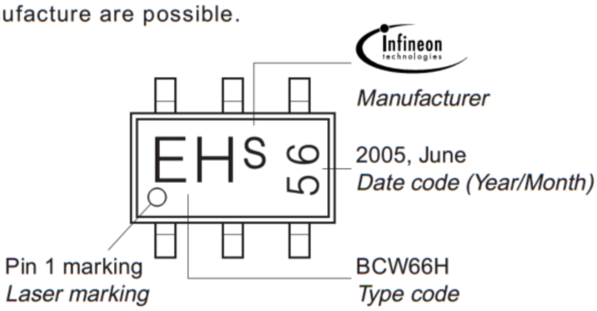


Foot Print



Marking Layout (Example)

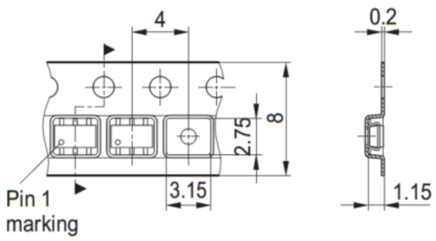
Small variations in positioning of
Date code, Type code and Manufacture are possible.



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



Published by
Infineon Technologies AG
81726 München, Germany

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