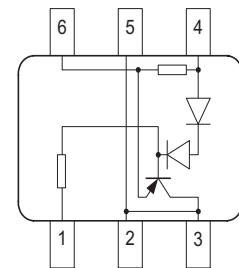
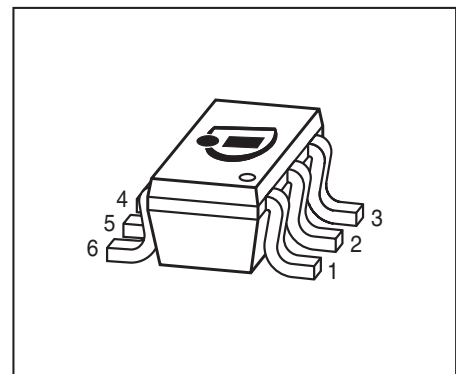


LED Driver

- Supplies stable bias current even at low battery voltage
- Ideal for stabilizing bias current of LEDs
- Negative temperature coefficient protects LEDs against thermal overload
- Suitable for 12V automotive applications
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101



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
Source voltage	V_S	40	V
Output current $V_S = 10\text{ V}$	I_{out}	65	mA
Output voltage	V_{out}	38	V
Reverse voltage between all terminals	V_R	0.5	
Total power dissipation, $T_S \leq 125\text{ °C}$	P_{tot}	500	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R_{thJS}	50	K/W

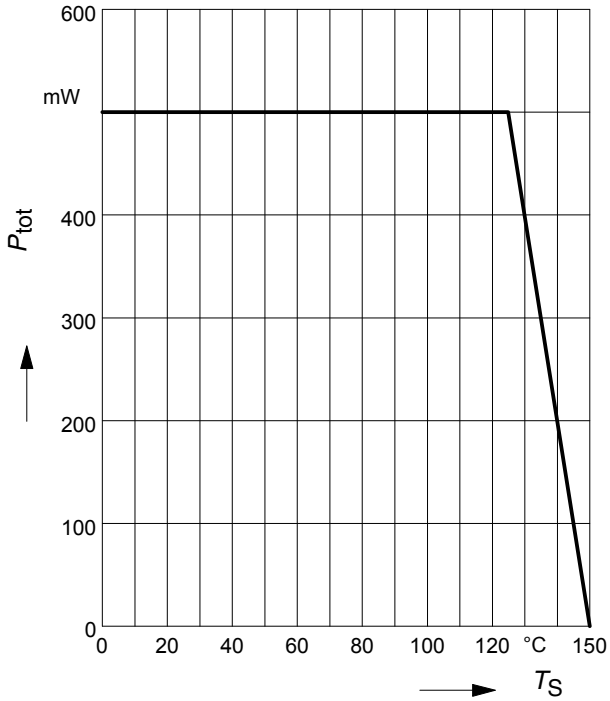
¹⁾Pb-containing package may be available upon special request

²⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

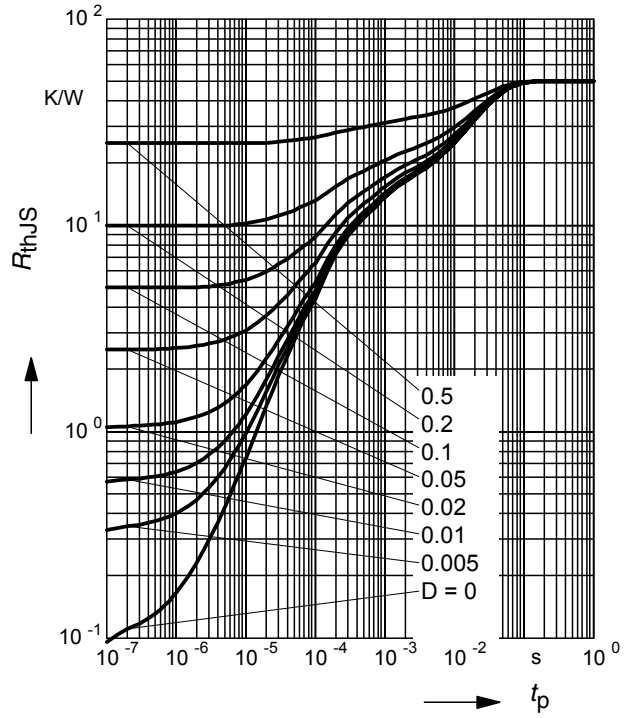
Electrical Characteristics at $T_A=25^\circ\text{C}$, unless otherwise specified

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

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

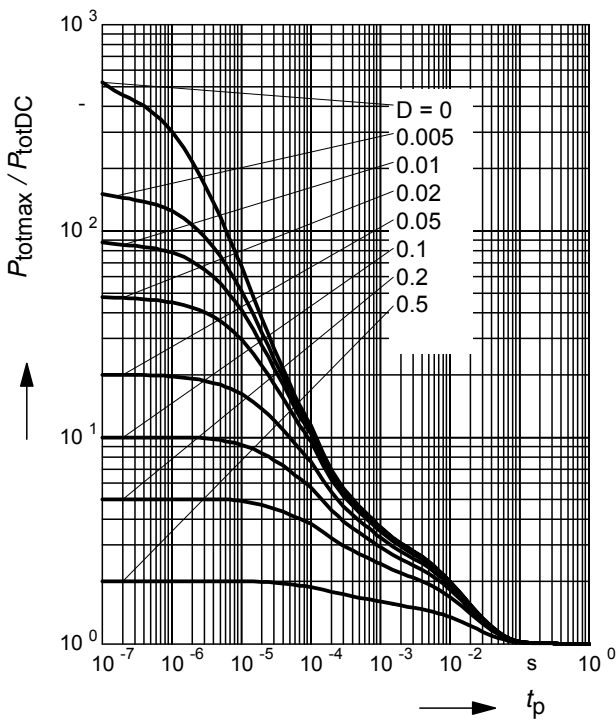


Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$



Permissible Pulse Load

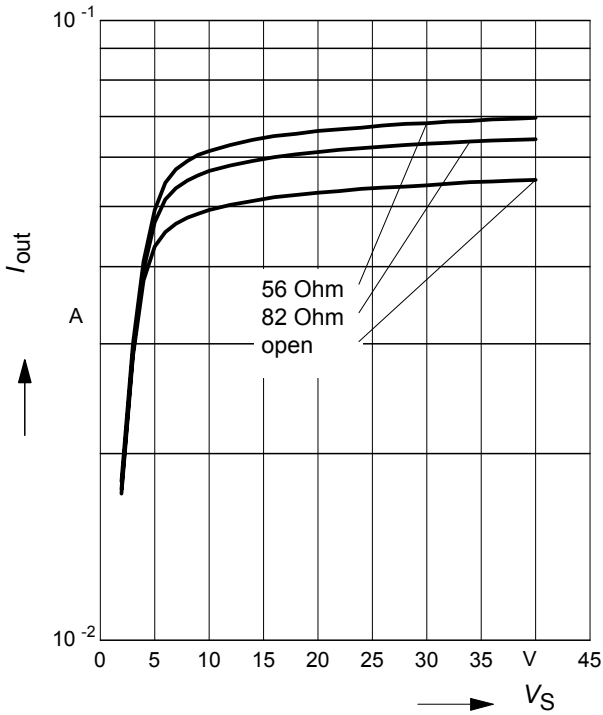
$P_{\text{totmax}} / P_{\text{totDC}} = f(t_p)$



Output current versus supply voltage

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

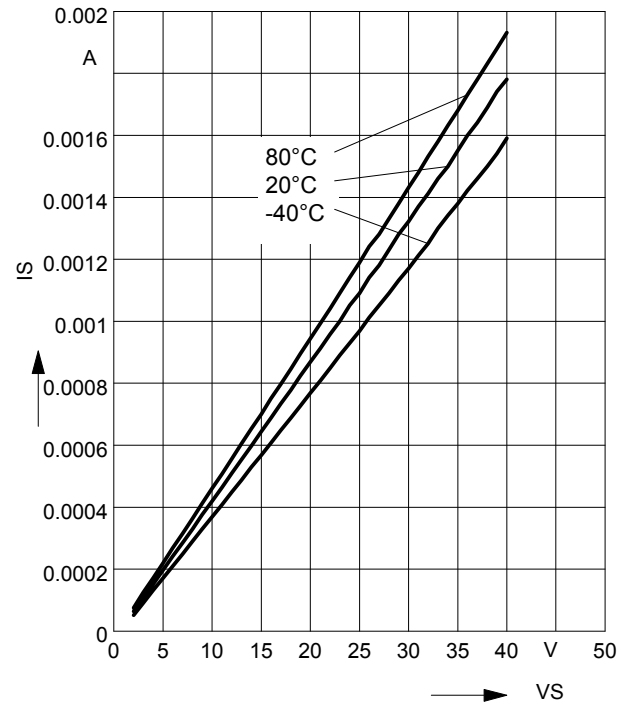
$V_S - V_{out} = 1.4 \text{ V}$



Supply current versus supply voltage

$I_S = f(V_S)$

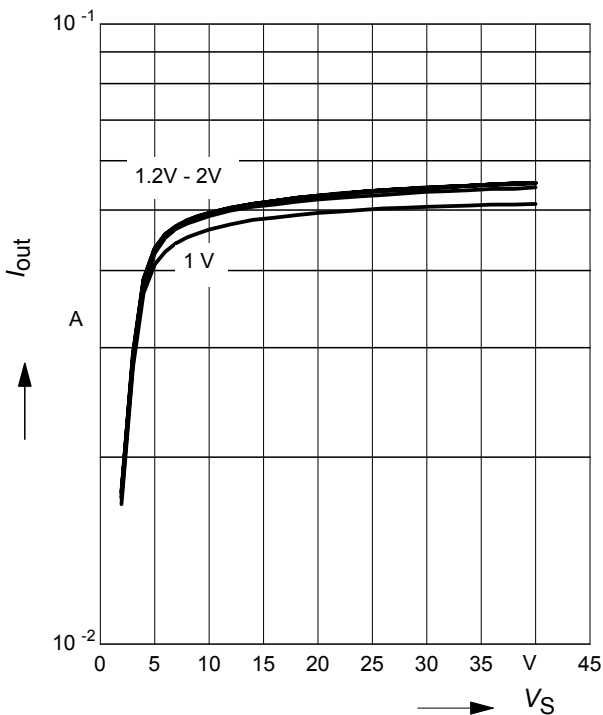
$T_A = \text{Parameter}$



Output current versus supply voltage

$I_{out} = f(V_S), T_A = 20^\circ\text{C}$

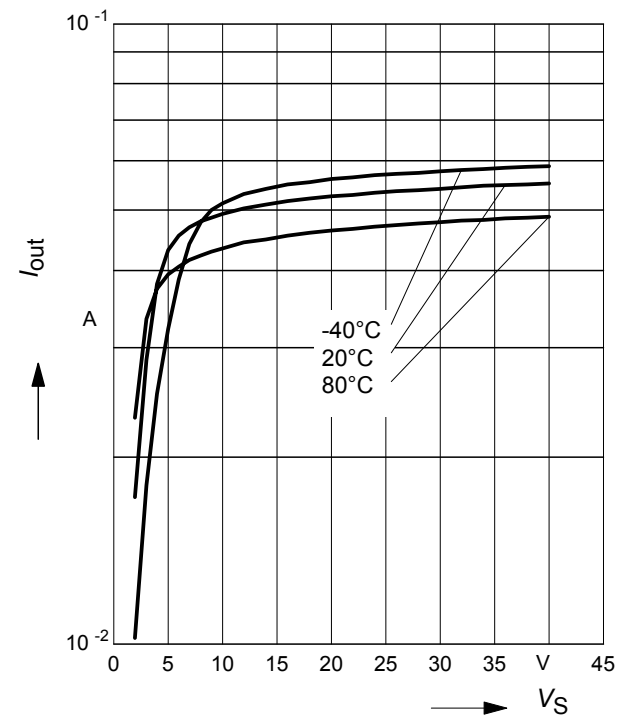
$V_S - V_{out}$ as Parameter



Output current versus supply voltage

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

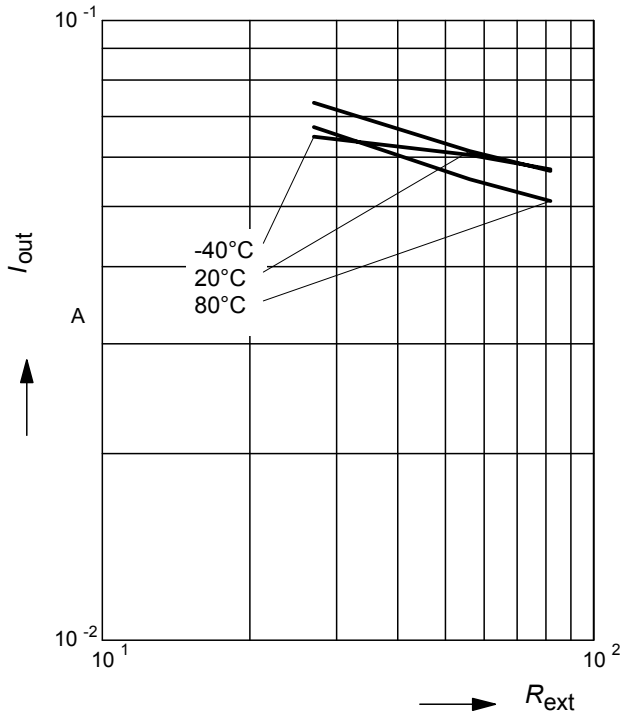
$T_A = \text{Parameter}$



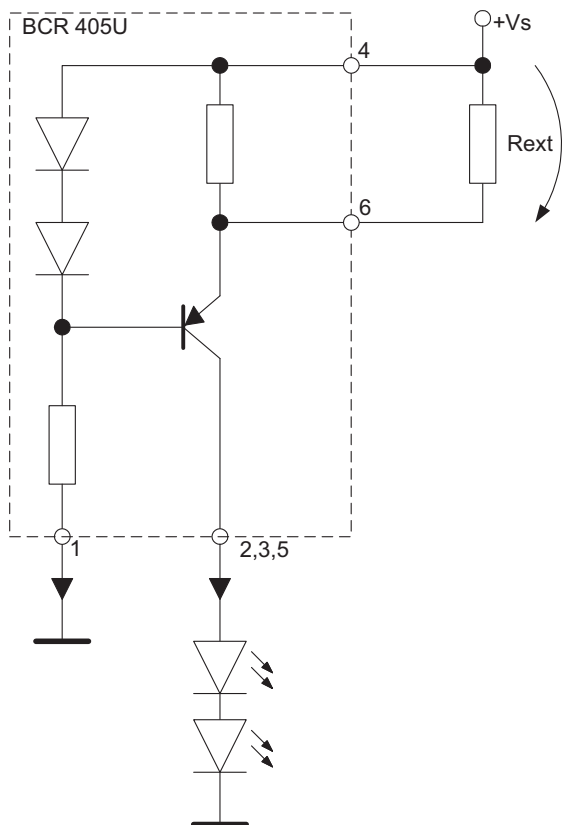
Output current versus external resistor

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

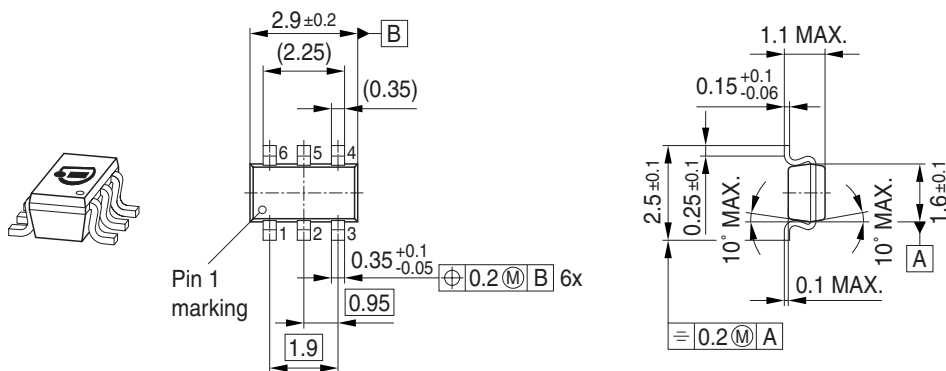
$T_A = \text{Parameter}$



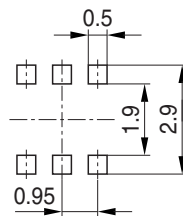
Application Circuit:



Package Outline

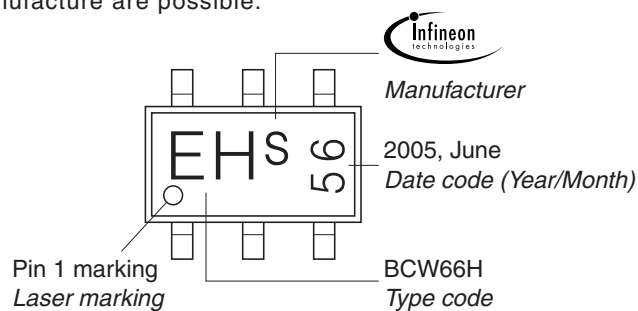


Foot Print



Marking Layout (Example)

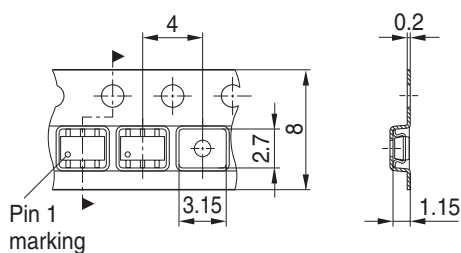
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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