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R1580 Calculator Tool

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R1580 is a powerful dimming control for LED lighting marketing. To use R1580, we should do tuning for some discrete component in other to achieve our request.

There 3 parameter need to set :

- 1. Rset
- 2. Rsns
- 3. Cset

The schematic of R1580 as below:





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Step1. Rset :

Rset is a component which is used for modify Vsource voltage setting. The Vsource in default is 0.4V and 0.8V depends on version of R1580.

To use Rset, we can decrease the voltage of Vsource.

For example :

If you don't use Rset, please set "Rset open" and you can see Vsource is 0.4 (default setting)

📥 R15	580 Calcu	ulater		_		\times
Rset	Cset	tDIMDLY				
Item	Select :	R1580N001A	\sim			
Co	ndition —					
	🔿 Use Rs	et		RsetOj	pen	
Rsns 1	;: Ω			[Calculat	te
Re S	sult Source Pin LED Curre	Voltage is 0.4 ent will be 400	V mA			
Made b	y Taipei A	eneas			V	'er. 1.00

If you would like to change Vsource voltage, please set "Use Rset" and input Rset value as following:



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Rset Cset tDIMDLY Item Select : R1580N001A ✓ Condition ● 0 ● Use Rset ● Rsns : Rset : 1 Ω 100 KΩ Calculate Result Source Pin Voltage is 0.1 V LED Current will be 100
Item Select : R1580N001A \checkmark Condition \bigcirc Use Rset \bigcirc Rset Open Rsns : Rset : 1 Ω 100 K Ω Calculate Result Source Pin Voltage is 0.1 V LED Current will be 100 mA
Source Pin Voltage is 0.1 V LED Current will be 100 mA

Step 2, Set Rsns :

After decided the Vsource, we can use Rsns to design LED current when dimming is 100%.

For example :



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Item Select : R1580N001A \checkmark Condition \textcircled{O} Use Rset \bigcirc Rset Open Rsns : Rset : $\boxed{1 \ \Omega} \ 100 \ K\Omega$ Calculate Result Source Pin Voltage is $\boxed{0.1 \ V}$ LED Current will be $\boxed{100 \ MA}$	Rset	Cset	tDIM	IDLY				
Condition	Item	Select :	R1580	ONOO1A	\sim			
 Use Rset Rsns : Rset : Ω 100 KΩ Calculate Result Source Pin Voltage is 0.1 V LED Current will be 100 mA 	Co	ndition						
Rsns: Rset: 1 Ω 100 K Ω Calculate Result Source Pin Voltage is 0.1 V LED Current will be 100 mA	(🖲 Use Ra	∞t		\bigcirc Rs	et Oper	n	
Source Pin Voltage is 0.1 V LED Current will be 100 mA	1	Ω		100	ΚΩ	0	Calculate	
LED Current will be 100 mA	Re	sult						
	-Re	sult Source Pin	Voltag	eis 0.1	V			
	Re S	suit Source Pin LED Curr	∖Voltag ent will	e is 0.1 be 100	V mA]		

Step 3. Fine tune the Cset

The PWM frequency on the DIM pin should be set in the range of 500 Hz to 100 kHz. Placing a Cset and a current setting resistor Rset between the ISET pin and GND can attenuate the PWM frequency components in the LED current. After decide Rset and PWM frequency, we can calculate Cset as follow:

For example : PWM is 8KHz, Rset is 100K.



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	580 Calcula	ater			×
Rset	Cset	tDIMDLY			
-Co	ndition				
	◉ Use Rset		0	Rset Open	
Re	8 KHz sult Cset should t	be more than	100 _{KΩ}	UF	culate

As a result, Cset value should be higher than 0.05uF.

Please Note, if the calculated result is less than 0.01uF, at least use Cset as 0.01uF. The application also remind this point as following :



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	📥 R1	580 Cal	culater —		\times	
	Rset	Cset	tDIMDLY			
	Co	ondition OUse :	Ricoh R1580	×		
	PW	M. Freque	The calculation is less than 0.0 Please use at least 0.01uF	01uF]	
	P	20		確定]]	
	_Ke	sun Cset shou	uld be more than 0.005 v	ıF		
	Made 1	y Taipei	Aeneas	Ver	. 1.00	
Step 4. Get suitable tDIM	DLY.					
When the LEDON signal SOURCE pin voltage. Afte	becoi er the	mes hi PWM	gh, the ISET pin voltage signal response time (t[gradua DIMDL\	ally gc ⁄)	bes up along with the
DIM Pin Voltage (V _{DIM})	V _{TH}					
SOURCE Pin Voltage (V _{so}	JRCE)	•				
LED Current (I _{LED})						
			t _{DIMDLY}	1		t DIMDLY



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After you set Cset and Rset, you can calculate tDIMDLY as below: 📥 R1580 Calculater \times **t**DIMDLY Cœt Rset Condition 🔘 Rset Open 🖲 Use Rset Cset : Rset : ¹⁰⁰ KΩ 0.1 Calculate uF Result 26.25 18.75 \leq tDIMDLY \leq mS mS Ver. 1.00 Made by Taipei Aeneas When you finish all of the setting, you have completed R1580 design.