

**Step-up DC-DC converter / white LED driver IC**  
**昇圧型DC-DCコンバータ / 白色LEDドライバIC**

**TK11840L-G**

**DESCRIPTION**

The TK11840L-G is a step-up DC-DC converter that drives an external NPN power transistor using a constant frequency PWM architecture. The IC works with a wide operating supply range (1.8V to 10V) and has an adjustable output. The IC timing oscillator operating frequency is programmable and can be set up to 1MHz. It also incorporates a soft-start circuit and a short-circuit detection function of a timer-latch type.

TK11840L-GはPWM方式のスイッチングレギュレータコントローラです。動作電源電圧は1.8Vから10Vです。発振周波数は1MHzまで調節可能です。ソフトスタート機能・タイマーラッチ式短絡検出機能を内蔵しております。

**FEATURES**

- Operation from 1.8V to 10.0V supply
- Adjustable output voltage
- High speed adjustable OSC: up to 1MHz
- Incorporates a soft start circuit
- Incorporates a short circuit detection of a timer-latch
- Totem-pole type output in which drive current is adjustable using an switching resistor: pin 4
- 1μA or less shutdown current
- Small package: SOT23L-8
- 低動作最低電源電圧:  $V_{OP}=1.8\sim 10.0V$
- 出力電圧調整可能
- 高速動作が可能: 最大1MHz
- ソフトスタート回路内蔵
- タイマーラッチ式短絡検出回路内蔵
- 出力はトータムポール形式でスイッチングTr.ドライブ電流調整可能 (NPNスイッチングトランジスタ対応)
- 1μA以下のシャットダウン電流
- 小型パッケージ: SOT23L-8

**APPLICATIONS**

- The White LED Driving Systems: 2 to 48 or more  
 For Back-lighting and Front-lighting, Flashlights etc.  
 Mobile Communication Systems:  
 Cellular Phone, PHS, DSC, PDA,  
 Computer Peripheral Equipment  
 Battery & Dry Cell Battery Systems  
 Portable Equipment
- Step-up DC-DC Converter (Voltage Supply)  
 Camera, Radio, Communications Equipment etc
- VCD Bias
- 白色LED駆動システム:  
 バックライト, フロントライト, フラッシュライトなど  
 モバイル通信機器:  
 携帯電話, PHS, DSC, PDA,  
 コンピュータ周辺機器  
 バッテリー駆動機器  
 携帯機器
- 昇圧型DC-DCコンバータ  
 カメラ, ラジオ, その他通信機
- VCDバイアス

**PACKAGE OUTLINE**

**ORDERING INFORMATION**

Part name	Package	Marking	Pin configuration	Ordering information												
TK11840L-G	 SOT23L-8	D40	See next page	<table border="1"> <tr> <td>T</td><td>K</td><td>1</td><td>1</td><td>8</td><td>4</td><td>0</td><td>L</td><td>T</td><td>L</td><td>-</td><td>G</td> </tr> </table> <p>Package code                      L: SOT23L-8</p> <p>Environment code                      G: Lead free</p> <p>Storage direction                      TL: Left type</p>	T	K	1	1	8	4	0	L	T	L	-	G
T	K	1	1	8	4	0	L	T	L	-	G					

**ABSOLUTE MAXIMUM RATINGS**

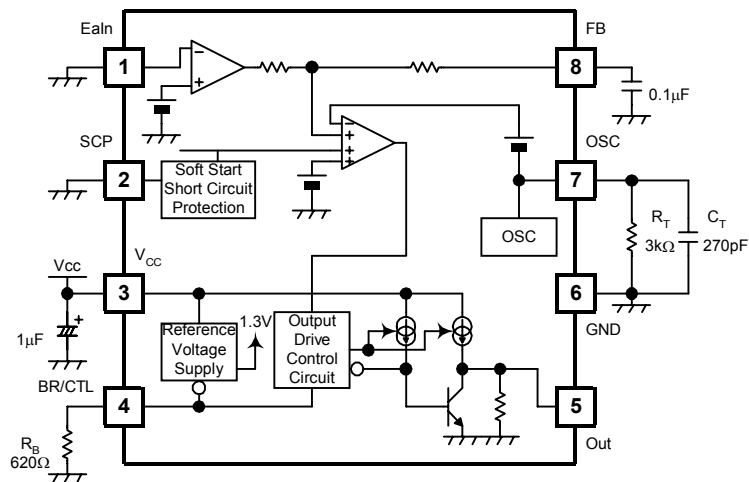
Parameter	項目	Symbol	記号	Rating	定格	Unit	単位	Remarks	備考
Operating Voltage Range	動作電圧範囲	$V_{OP}$		1.8 to 10.0		V			
Operating Temperature Range	動作温度範囲	$T_{OP}$		-20 to +85		°C			
Power Dissipation	許容消費電力	$P_D$		400		mW			
Operating Frequency Range	動作周波数範囲	$f_{OP}$		to 1		MHz			

ELECTRICAL CHARACTERISTICS

$V_{IN}=2.0V, T_A=25^{\circ}C$

Parameter 項目	Symbol 記号	Value			Units 単位	Conditions 条件
		MIN	TYP	MAX		
Switch Maximum Voltage スイッチ最大電圧	$V_{SW, max}$	Depending on external Tr.				
Switch Maximum Current スイッチ最大電流	$I_{SW, peak}$	Depending on external Tr.				
Switch Maximum Base Current スイッチ最大ベース電流	$I_{Out, max}$			50	mA	Adjustable by $R_B$
Maximum Duty Ratio 最大デューティ比	$D_{MAX}$	65	75	85	%	
Error Amplifier Reference Voltage エラーアンプ基準電圧	$V_{EA}$	0.48	0.50	0.52	V	
Quiescent Current 静止動作電流	$I_{IN, ON}$		5.0	9.0	mA	
Shutdown Supply Current シャットダウン電源電流	$I_{IN, OFF}$		0.1	1	uA	

BLOCK DIAGRAM



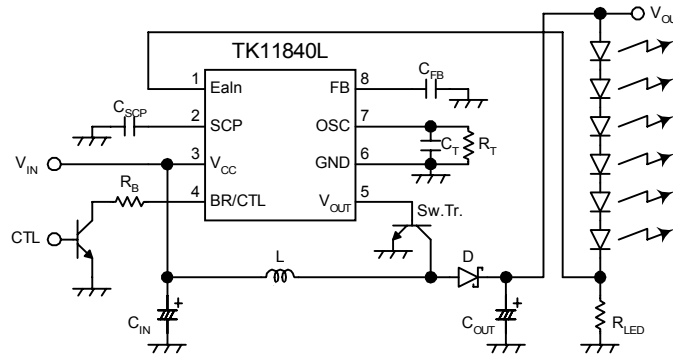
**6 WHITE LED DRIVER APPLICATION WITH ON/OFF CONTROL**

■ Designed Performance

Input Voltage	$V_{IN}=2.5$ to $10.0V$
LED Current	$I_{LED}=20mA$
Oscillation Frequency	$260kHz$
Inductor Peak Current	$560mA$
Coil (TOKO)	Type D52LC A914BYW-100M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	10	$\mu H$
Input Capacitor	$C_{IN}$	4.7	$\mu F$
Output Capacitor	$C_{OUT}$	2.2	$\mu F$
Short Circuit Protection Resistor	$C_{SCP}$	0.1	$\mu F$
Bias Resistor	$R_B$	2	$k\Omega$
Time Capacitor	$C_T$	270	$\mu F$
Time Resistor	$R_T$	6.8	$k\Omega$
Feedback Capacitor	$C_{FB}$	0.1	$\mu F$



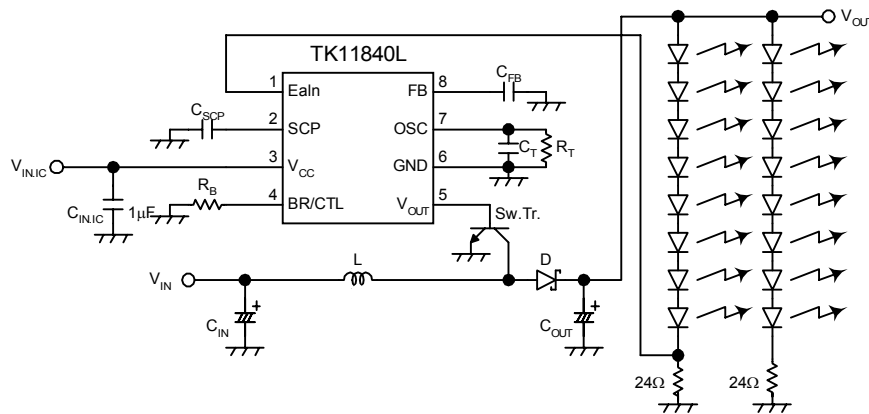
**16 WHITE LED DRIVER APPLICATION**

■ Designed Performance

Input Voltage	$V_{IN}=12\pm 1V$
LED Current	$I_{LED}=20mA+20mA$
Oscillation Frequency	$440kHz$
Inductor Peak Current	$300mA$
Coil (TOKO)	Type D52LC A914BYW-470M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	47	$\mu H$
Input Capacitor	$C_{IN}$	4.7	$\mu F$
Output Capacitor	$C_{OUT}$	10	$\mu F$
Short Circuit Protection Resistor	$C_{SCP}$	0.1	$\mu F$
Bias Resistor	$R_B$	2	$k\Omega$
Time Capacitor	$C_T$	1000	$\mu F$
Time Resistor	$R_T$	1	$k\Omega$
Feedback Capacitor	$C_{FB}$	0.1	$\mu F$



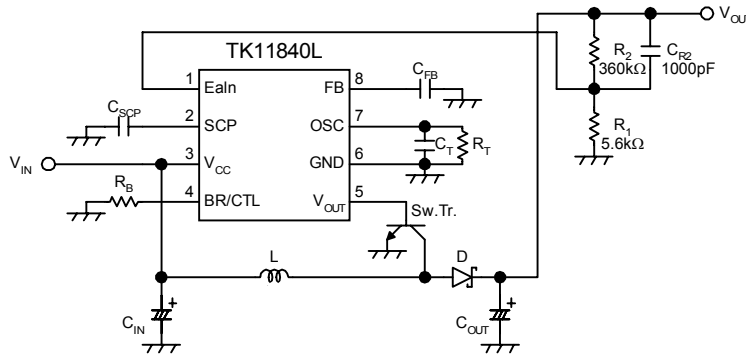
**V<sub>OUT</sub>=32V STEP-UP DC-DC CONVERTER FOR LDC/VCD BIAS APPLICATION**

■ Designed Performance

Input Voltage	V <sub>IN</sub> =4.5 to 5.5V
Output Current	I <sub>OUT</sub> =up to 10mA
Output Voltage	V <sub>OUT</sub> =32V
Oscillation Frequency	110kHz
Inductor Peak Current	250mA
Coil (TOKO)	Type D52LC A914BYW-101M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	100	μH
Input Capacitor	C <sub>IN</sub>	4.7	μF
Output Capacitor	C <sub>OUT</sub>	10	μF
Short Circuit Protection Resistor	C <sub>SCP</sub>	0.1	μF
Bias Resistor	R <sub>B</sub>	2	kΩ
Time Capacitor	C <sub>T</sub>	1000	pF
Time Resistor	R <sub>T</sub>	4.7	kΩ
Feedback Capacitor	C <sub>FB</sub>	0.1	μF



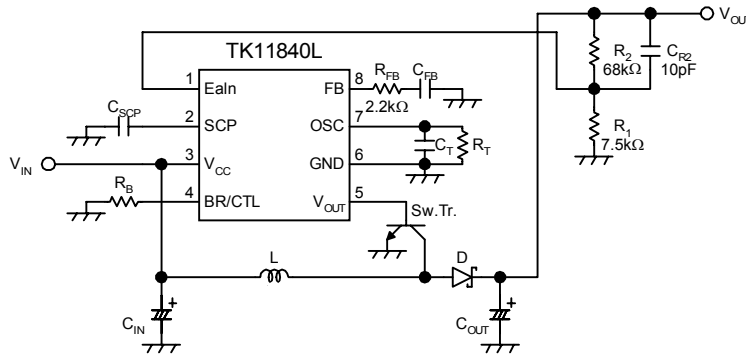
**V<sub>OUT</sub>=5V STEP-UP DC-DC CONVERTER FOR SPEAKER DRIVER APPLICATION**

■ Designed Performance

Input Voltage	V <sub>IN</sub> =3.0 to 4.0V
Output Current	I <sub>OUT</sub> =up to 300mA
Output Voltage	V <sub>OUT</sub> =5.0V
Oscillation Frequency	740kHz
Inductor Peak Current	800mA
Coil (TOKO)	Type D412F 972AS-4R7M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	4.7	μH
Input Capacitor	C <sub>IN</sub>	4.7	μF
Output Capacitor	C <sub>OUT</sub>	22	μF
Short Circuit Protection Resistor	C <sub>SCP</sub>	0.1	μF
Bias Resistor	R <sub>B</sub>	1	kΩ
Time Capacitor	C <sub>T</sub>	270	pF
Time Resistor	R <sub>T</sub>	2.2	kΩ
Feedback Capacitor	C <sub>FB</sub>	0.1	μF



\* Please inquire us about applications except above.  
上記以外のアプリケーションについてはお問い合わせ下さい。