150KHz, 3A PWM Buck Switching Regulator

The PJ2596 is a monolithic integrated circuit that provide all the active function for a step-down switching regulator, capable of driving a 3A load without additional transistor component. The external shutdown function can be controlled by TTL logic level and then into standby mode. The internal compensation makes feedback control have good line and load regulation without external design. Regarding protected function, thermal shutdown is to prevent over temperature operating from damage, and current limit is against over current operating of the output switch. The PJ2596 operates at a switching frequency of PJ2596 thus allowing smaller sized filter components than what would be needed with lower frequency switching regulators. Other features include a guaranteed ±4% tolerance on output voltage under specified input voltage and output load conditions, and ±15% on the oscillator frequency. The output version included fixed 3.3V, 5V, 12V, and an adjustable type.

FEATURES

- 3.3V, 5V, 12V and adjustable output versions
- Input voltage range up to 25V
- Output load current: 3A
- Built-in switching transistor on chip
- Low power standby mode
- ON/OFF shutdown control input
- Thermal-shutdown and current-limit protection
- 150kHz fixed frequency internal oscillator
- Voltage mode non-synchronous PWM control
- Adjustable version output voltage range, 1.23V to 25V±4% max over line and load condition

APPLICATIONS

- Simple High-efficiency step-down(buck) regulator
- Battery Charger
- Positive to negative converter
- On-card switching regulator
- Efficient preregulator for linear regulator

TO-220-5L TO-263-5L

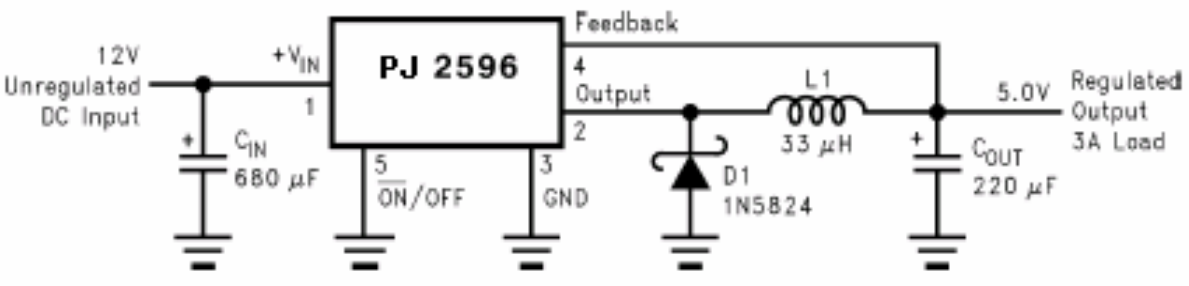
PIN 1. Input
2. Output
3. Ground
4. Feed Back
5.On/off

ORDERING INFORMATION

Device	Operating Temperature	Package
PJ2596CZ-xx	-40℃ to +85℃	TO-220-5L
PJ2596CM-xx		TO-263-5L

Note: xx is output voltage available for Adj /3.3V/ 5.0v/ 12V. Contact factory for additional voltage option.

TYPICAL APPLICATION CIRCUIT



ABSOLUTE MAXIMUM RATINGS

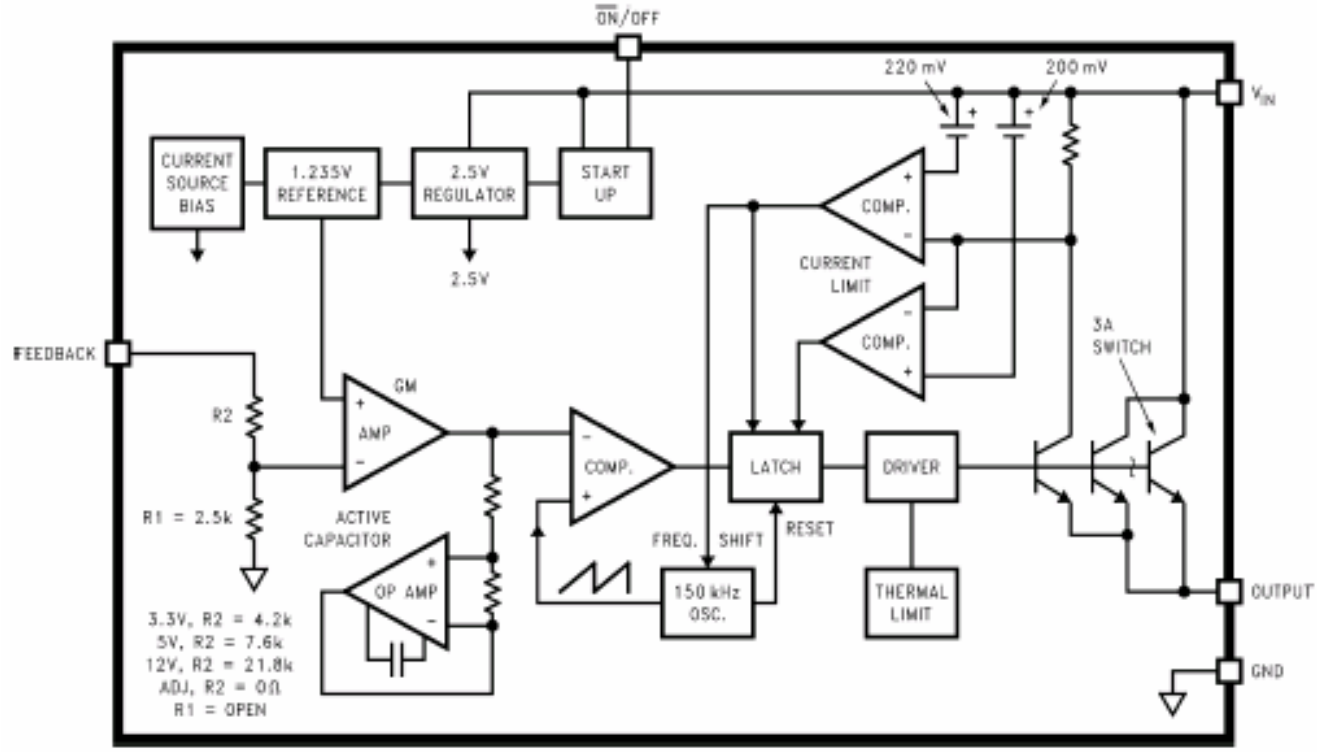
Parameter	Symbol	Rating
Supply Voltage	Vcc	25V
ON/OFF Pin input voltage	Von/off	-0.3 to +25V
Feedback Pin voltage	V_{FB}	-0.3 to +25V
Output voltage to ground	Vout	-1V
Power dissipation	P_D	Internally limited
Storage tempurature	T_{ST}	-65 to +150℃
Operating tempeture	T_{OP}	-40 to +125℃
Operating voltage	V_{OP}	+4.5 to +25V

ELECTRICAL CHARACTERISTICS

Vin =12V for the 3.3V, 5V, and Adjustable version and Vin =24V for the 12V version , Tj = 25℃, I_L = 0.3A, unless otherwise noted.

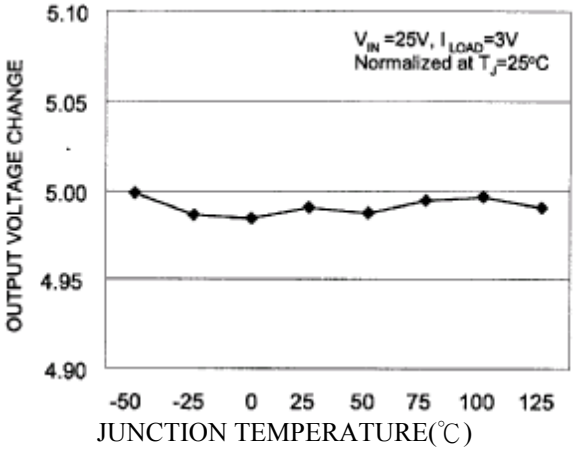
Parameter		Conditions		Min	Typ	Max	UNITS
Feedback Bias Current		VFB = 1.3V(Adjustable Version Only)		--	40	60 100	nA
Oscillator Frequency				127 110	150	173 173	kHz
Saturation Voltage		IOUT = 3ANo outside circuit V_{FB}=0V force driver on			1.3	1.4 1.5	V
Max Duty Cycle (ON) Min Duty Cycle (OFF)		V_{FB}=0V force driver on V_{FB}=12V force driver off			100 0		%
Current Limit		Peak Current No outside circuit V_{FB}=0V force driver on		3.5	4.5	5.5 6.5	A
Output Leakage Current	Output = 0V	No outside circuit V_{FB}=12V force driver off Vin=24V		--		200	uA
	Output = -1V				2	30	mA
Quiescent Current		V_{FB}=12 force driver off		--	5	10	mA
Standby Quiescent Current		ON/OFF pin = 5V (OFF)		--	50	250 300	uA
ON/OFF pin logic input voltage threshold		Low (regulator ON) High (regulator OFF)		2.0	1.3	0.6	V
ON/OFF pin logic input current		V_{LOGIC}=2.5V (OFF) V_{LOGIC}=0.5V (ON)		--	15	25	uA
ON/OFF pin input current				--	0.02	5	
Thermal Resistance		TO-220-5L	Junction to Case	--	2.5	--	℃/W
		TO-263-5L			3.5		
Thermal Resistance With copper area of approximately 3 in^2		TO-220-5L	Junction to Ambient	--	28	--	℃/W
		TO-263-5L			23		

BLOCK DIAGRAM AND TYPICAL APPLICATIONS

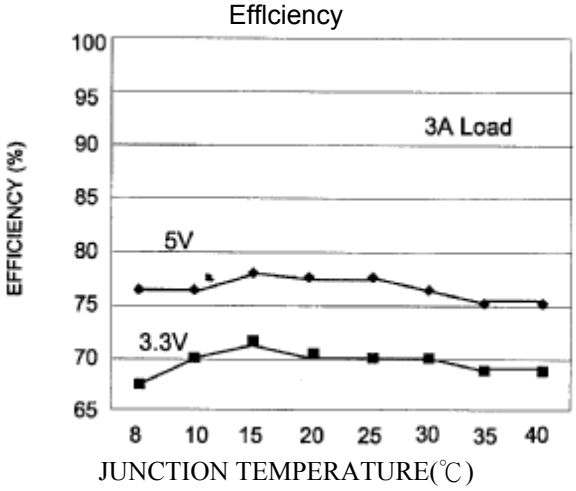


TYPICAL PERFORMANCE CHARACTERICTICS

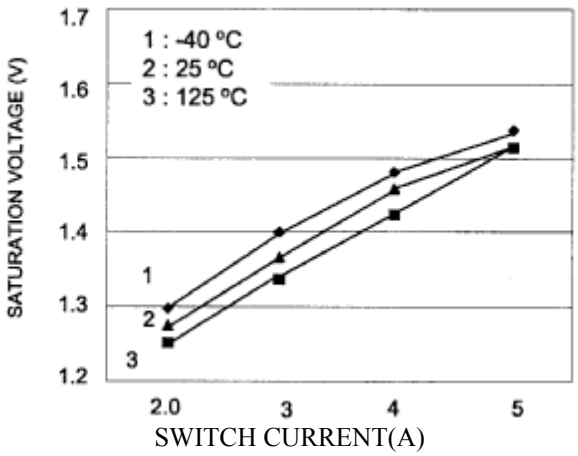
Typical Performance Characteristics
Normalized Output Voltage



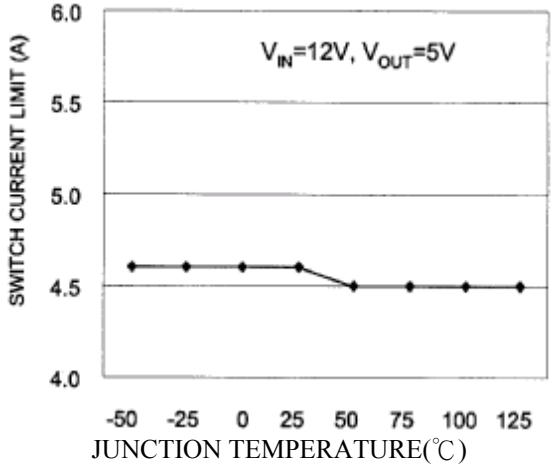
Efflciency



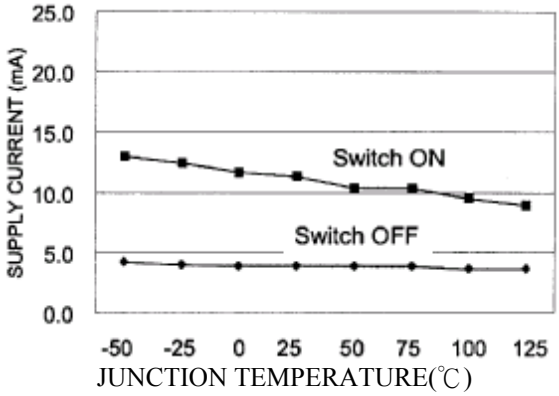
Switch Saturation Voltage



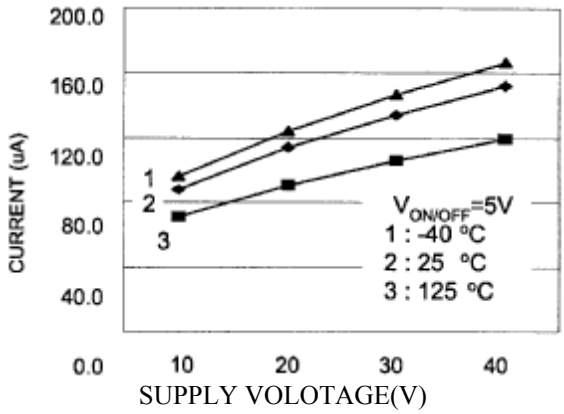
Switch Current Limit



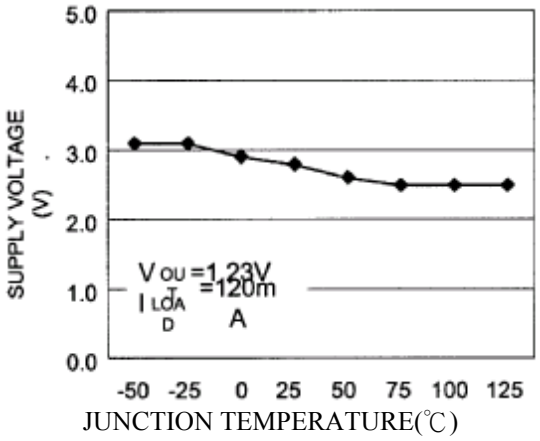
Operating Quiescent Current



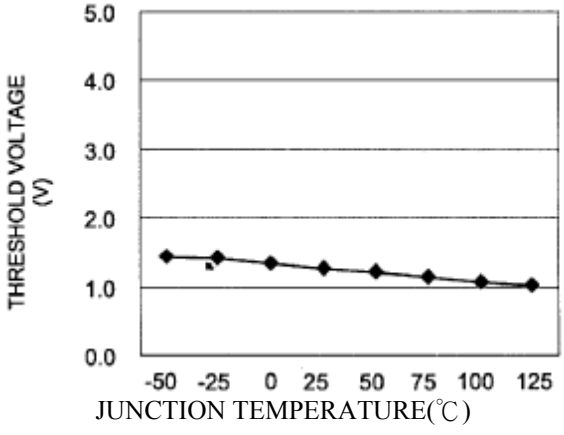
Shutdown Quiescent Current



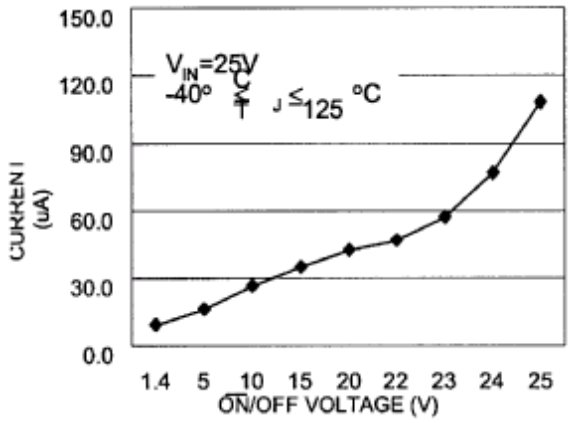
Minimum Operating Supply Votage



ON/OFF Threshold Voltage

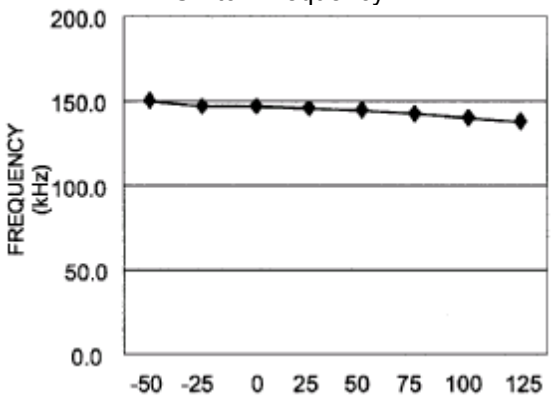


ON/OFF Current (Sinking)



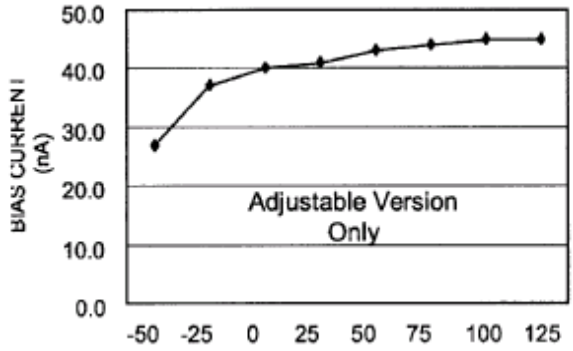
ON /OFF VOLTAGE(V)

Switch Frequency



JUNCTION TEMPERATURE(℃)

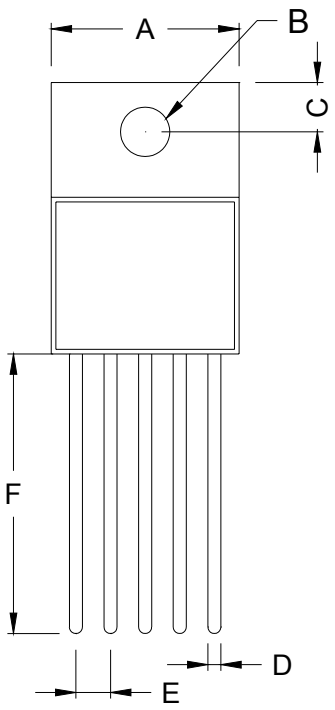
Feedback Pin Bias Current



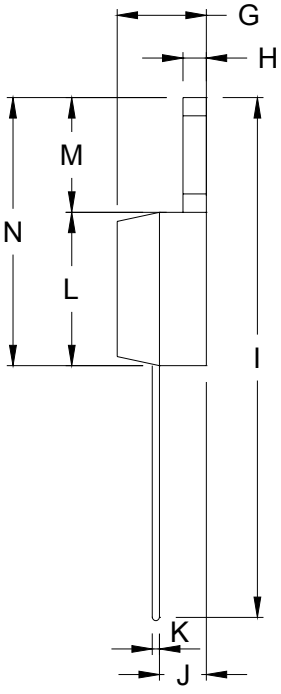
JUNCTION TEMPERATURE(℃)

TO-220-5L Mechanical drawing

1.Top View



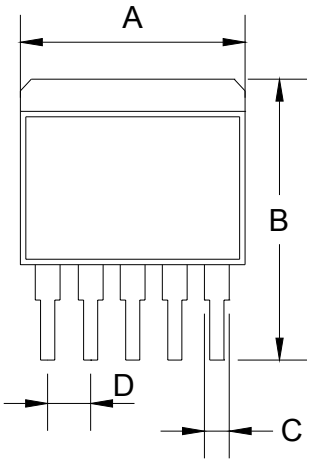
2.Side View



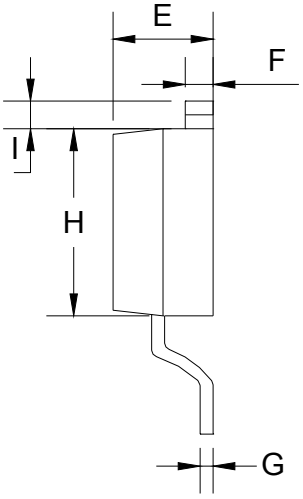
TO-220-5L DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.00	10.50	0.393	0.413
B	3.70	3.90	0.145	0.154
C	2.65	2.80	0.104	0.110
D	0.80	0.90	0.031	0.035
E	1.65	1.75	0.064	0.069
F	13.80	14.00	0.543	0.551
G	4.50	4.60	0.177	0.181
H	1.24	1.28	0.048	0.050
I	28.60	28.80	1.125	1.134
J	2.48	2.55	0.097	0.100
K	0.36	0.40	0.014	0.016
L	8.40	8.70	0.330	0.343
M	6.10	6.40	0.240	0.252
N	14.70	14.90	0.578	0.587

TO-263-5L Mechanical drawing

1.Top View



2.Side View



TO-263-5L DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.00	10.50	0.393	0.413
B	14.60	15.87	0.574	0.625
C	0.75	0.90	0.029	0.035
D	1.57	1.82	0.061	0.072
E	4.40	4.65	0.173	0.183
F	1.10	1.40	0.043	0.055
G	0.30	0.50	0.011	0.020
H	8.50	8.70	0.334	0.343
I	1.14	1.40	0.044	0.055