iP7623P



Green Product

Primary Side Q-R Mode Switcher

1. Description

The iP7623P is an excellent primary side feedback switcher with CV/CC operation, integrated several functions of protections. It minimizes the components counts and is available in a DIP-8 package. Those make it an ideal design for low cost applications.

It provides functions of low startup current, green-mode power-saving operation, leading-edge blanking of the current sensing and internal slope compensation. Also, the iP7623P features OTP (Over Temperature Protection) and OVP (Over Voltage Protection) to prevent the circuit being damaged from the abnormal conditions.

In most cases, the power supply with primary-side feedback controller would accompany with some serious load regulation effect. To deal with this problem, the iP7623P consists of dedicated load regulation compensation circuit to improve it.

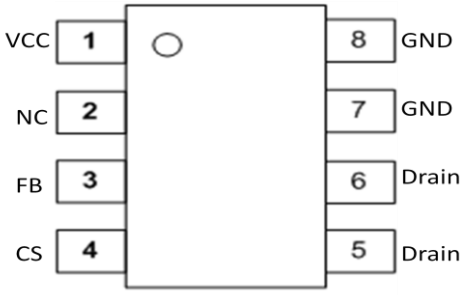
2. Applications

- EC-Motor Power
- Lower Power AC/DC Adaptor

3. Features

- Primary-side feedback control with quasi-resonant operation
- Built-in 650V/4A MOS Switch
- Built-in Load Regulation Compensation
- Constant current control
- Low Startup Current (<1.5 uA)
- 90 kHz Maximum Switching Frequency.
- Current Mode Control with Cycle-by-Cycle Current Limit
- Green Mode Control
- 16V/7V UVLO (Under Voltage Lockout)
- LEB (Leading-Edge Blanking) on CS Pin
- VCC OVP (Over Voltage Protection)
- Internal OTP (Over Temperature Protection)

4. Pin Assignments



DIP-8L

5. Marking Information

Product Name	Marking
iP7623P	iP7623P XXXXXX X : Date Code



6. Ordering Code

iP7623P □	Assembly Material G: Halogen and Lead Free Device

Note: inergy defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight ; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

7. Pin Description

Pin No	Name	Description
1	VCC	Supply voltage pin.
7/8	GND	GND
3	FB	Auxiliary voltage sense and Quasi Resonant detection.
4	CS	Current sense pin, connect to sense the switch current.
5/6	Drain	Drain of the integrated MOSFET switch

8. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage VCC,	Vcc	32	V
Start-up Drain Source Voltage (T_J = 25 to 125 °C)	Drain	-0.3V ~ 650	V
Current sense	CS	-0.3V ~ 6	V
FB (IFB = 6mA @T < 200 ns)	FB	-0.8V~3.5	V
Maximum Junction Temperature		150	°C
Continuous drain current (TC = 25 ℃)	I_{DC}	2	A
Pulsed drain current (TC = 25 ℃)	I_P	8	A
Storage Temperature Range	T_{STG}	-65 to 150	°C
Package Thermal Resistance	(θJA)	80	°C/W
Power Dissipation (DIP-8, at Ambient Temperature = 85 °C)	PD	500	mW
Lead temperature (Soldering, 10 Sec.)		260	°C
ESD Voltage Protection, Human Body Model (DRAIN pin is exclusive)	HBM	2.5	KV
ESD Voltage Protection, Machine Model (DRAIN pin is exclusive)	MM	250	V

*Note1: The value of θ_{JA} is measured with the device mounted on 1oz one layer FR-4 board, in a still air environment with Ta = 25°C. The value in any given application depends on the user's specific board design.

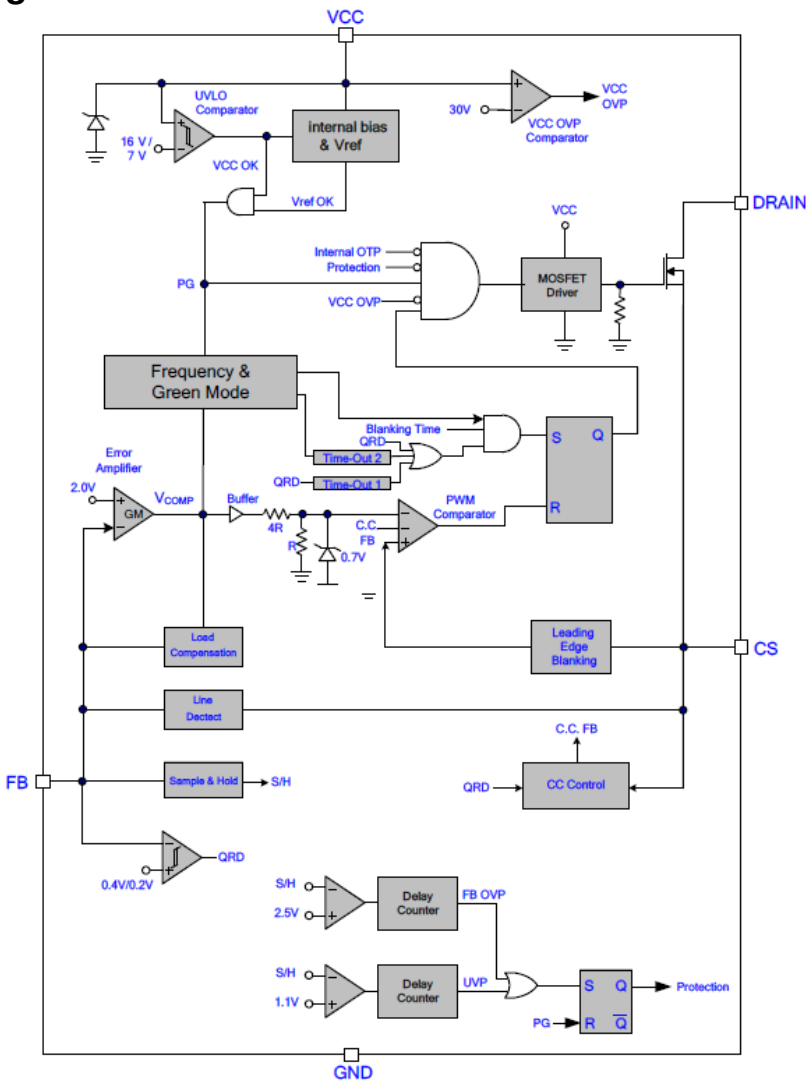
Caution: Stresses beyond the ratings specified in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this. Specification is not implied.

9. Recommended Operating Conditions

Parameter	Min	Max	Unit
Operating Junction Temperature	-40	125	°C
Analog Supply Voltage	9	20	V
Start-up capacitor	2.2	10	uF
AC Start-up resistor	2	6.2	MΩ

Note:
1. It's essential to connect VCC pin with a SMD ceramic capacitor (0.1uF ~ 0.47uF) to filter out the undesired switching noise for stable operation. This capacitor should be placed close to IC pin as possible.
2. The small signal components should be placed to IC pin as close as possible.

10. Block Diagram





11. Electrical Characteristics

(Ta=25℃, Vcc =12V, unless otherwise specified)

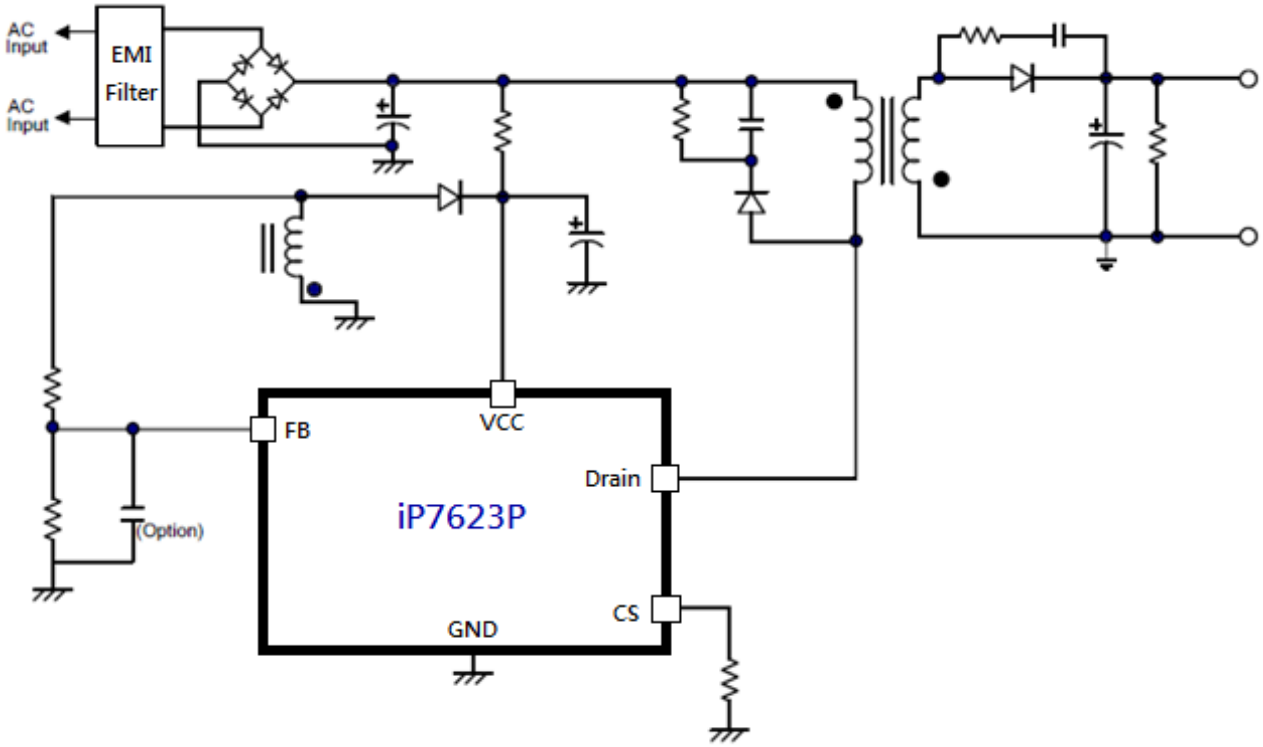
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Supply Voltage (VCC Pin)						
Startup Current	VCC=UVLO-ON-0.05V*	I_{CC_ST}		1	1.9	uA
Operating Current	VCOMP=0V, OUT=open*	I_{CC_OP}		0.7		mA
UVLO (OFF)		V_{CC_OFF}	6.5	7	7.5	V
UVLO (ON)		V_{CC_ON}	15	16	17	V
VCC OVP Level		V_{CC_OVP}	28.5	30	31.8	V
QRD (Quasi Resonant Detection, FB Pin)						
Reference Voltage, VREF		V_{REF}	1.975	2.00	2.025	V
FB OVP Level	*	V_{FB_OVP}		2.5		V
Under Voltage Level		V_{FB_UVP}		1.1		V
Current Sense (CS Pin)						
LEB time	*	T_LEB		450		ns
Maximum Input Voltage	*	V_{CS_MAX}		0.7		V
Minimum VCS-off	At High Line*	$V_{CS_MIN_H}$		0.125		V
Minimum VCS-off	At Low Line*	$V_{CS_MIN_L}$		0.165		V
Oscillator for Switching Frequency						
Maximum Frequency		F_{S_MAX}	75	90	105	kHz
Minimum Frequency		F_{S_MIN}	0.2	0.35	0.5	kHz
Maximum On Time		T_{ON_MAX}	20	25	32	us
Internal OTP (Over Temperature)						
OTP Level	*	T_{OTP}		140		°C
OTP Hysteresis	*	T_{OTP_HYS}		22		°C
MOSFET Drain (DRAIN Pin)						
Breakdown Voltage	VGS=0V, ID=250μA	V_{DS}	650			V
	Peak <400ns		670			
On Resistance	VGS=10V, ID=2A	R_{DS_ON}		2.3	2.65	Ω

*: Guaranteed by design

12. Protection Mode

Protection Name	Mode
VCC_OVP	Auto-Restart
FB_OVP	Auto-Restart
FB Open/Short	Auto-Restart
Internal OTP	Auto-Restart

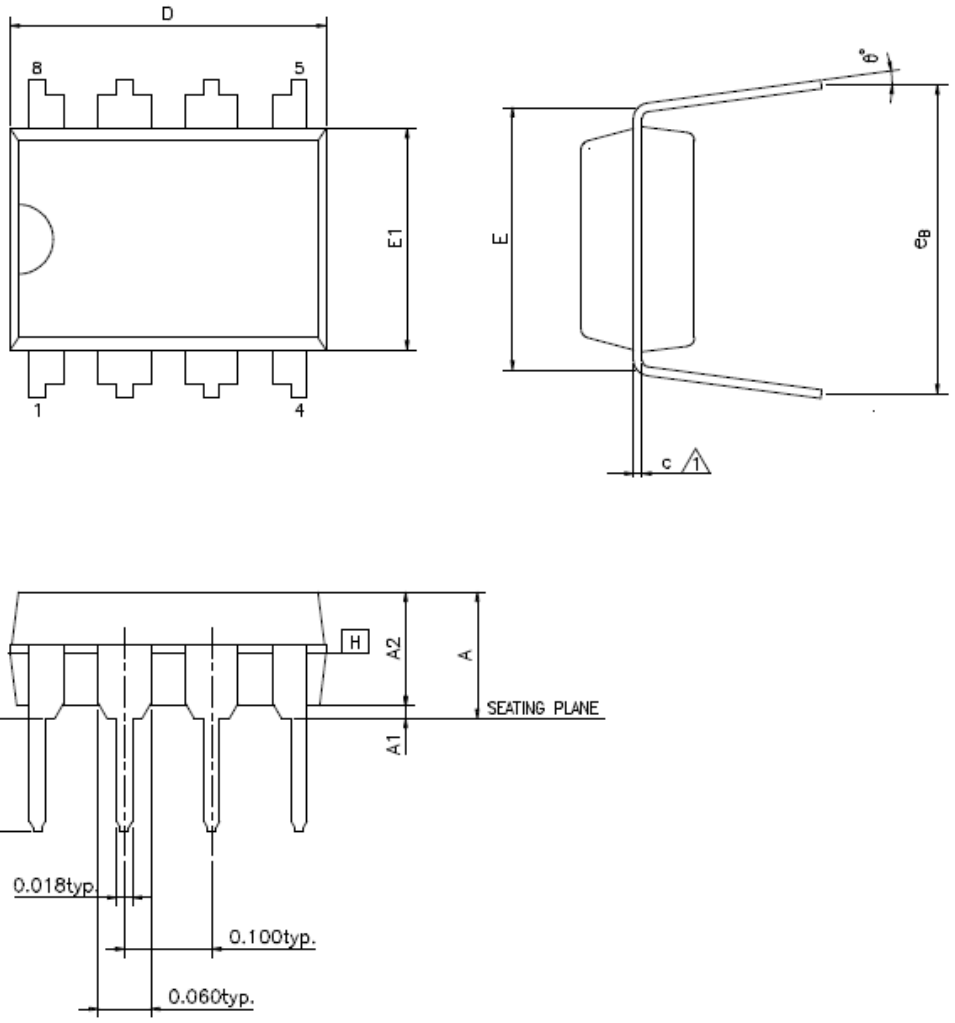
13. Typical Application Circuit





14. Package Dimensions

DIP- 8L



SYMBOLS	MIN.	NOR.	MAX.
A	–	–	0.210
A1	0.015	–	–
A2	0.125	0.130	0.135
c	0.008	0.010	0.014
D	0.355	0.365	0.400
E		0.300 BSC.	
E1	0.245	0.250	0.255
L	0.115	0.130	0.150
e_B	0.335	0.355	0.375
θ°	0	7	15

NOTES:

1. JEDEC OUTLINE : MS-001 BA
2. "D","E1" DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED .010 INCH.
3. eB IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
4. POINTED OR ROUNDED LEAD TIPS ARE PREFERRED TO EASE INSERTION.
5. DISTANCE BETWEEN LEADS INCLUDING DAM BAR PROTRUSIONS TO BE .005 INCH MININUM.
6. DATUM PLANE H COINCIDENT WITH THE BOTTOM OF LE WHERE LEAD EXITS BODY.