



SP689

Ultra High Voltage Start Up

DESCRIPTION

The SP689 is a low cost version ultra high voltage start up IC. This IC is ideal to use in conjunction with any PWM to further reduce the standby power. By using SP689, it can eliminate the need for startup resistors and bleeder resistors in switching mode power supply design. It would provide the users a superior AC/DC power application with higher efficiency and lower standby power. With low external component counts, SP689 is a low cost solution for the applications. SP689 is available in SOT-23-5L package.
Meeting IEC60950-1(ed.2) Safety requirements.

APPLICATIONS

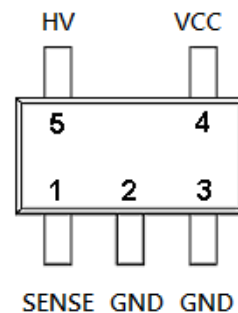
- AC/DC Switching Power Adaptor
- Battery Charger
- Open-Frame Switching Power Supply
- LED Power Supply

FEATURES

- 700V CDMOS Process
- Auto Re-Start
- SOT-23-5L Package
- For HV start up application (IEC60950-1(ed.2) Safety requirements.)

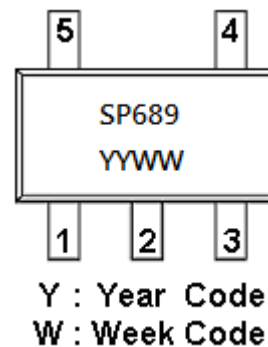
PIN CONFIGURATION

SOT-23-5L



PART MARKING

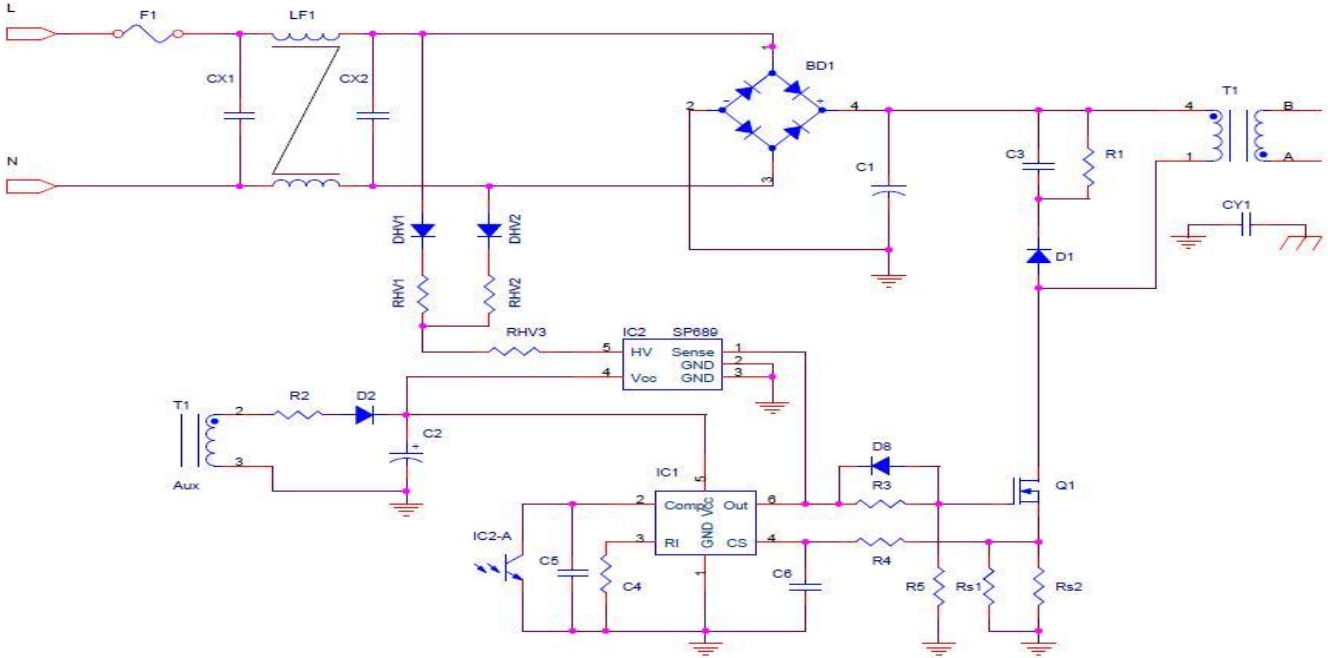
SOT-23-5L





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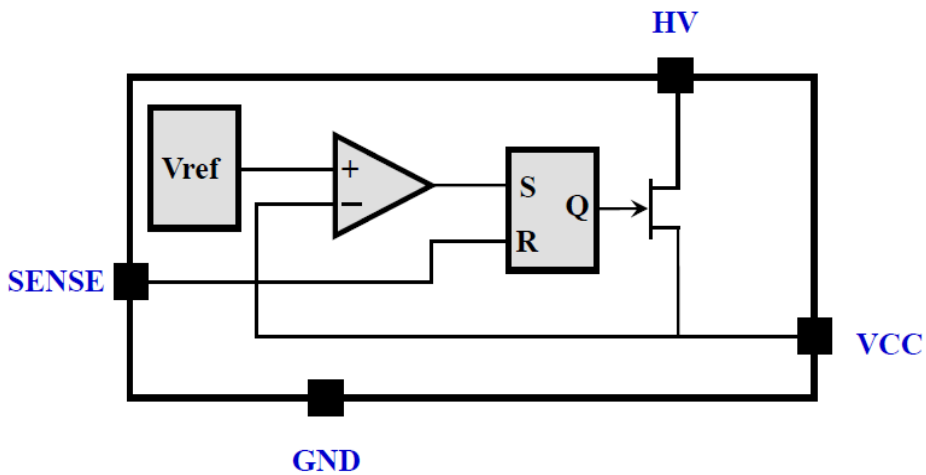
TYPICAL APPLICATION CIRCUIT



PIN DESCRIPTION

Pin	Symbol	Description
1	SENSE	Sense External Signal to Switch off HV MOSFET
2	GND	Ground
3	GND	Ground
4	VCC	Supply Voltage In
5	HV	Ultra High Voltage

BLOCK DIAGRAM





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ORDERING INFORMATION

Part Number	Package	Part Marking
SP689S25RGB	SOT-23-5L	SP689

※ SP689S25RGB : Tape Reel ; Pb – Free ; Halogen-Free

ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified.)

The following ratings designate persistent limits beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V _{HV}	HV Voltage	-0.3~700	V
V _{CC/SENSE}	VCC / SENSE Voltage	-0.3 ~ 40	V
P _D	Power Dissipation @ T _A =85°C (*)	0.3	W
ESD	Human Body Model	4000	V
	Machine Model	300	V
T _J	Operating Junction Temperature Range	-40 ~ 150	°C
T _{STG}	Storage Temperature Range	-40 ~ 150	°C
R _{θJC}	Thermal Resistance Junction – Case (*)	SOT-23-5L 210	°C/W

(*) The power dissipation and thermal resistance are evaluated under copper board mounted with free air conditions.

ELECTRICAL CHARACTERISTICS

(T_A=25°C, V_{HV}=30V, unless otherwise specified.)

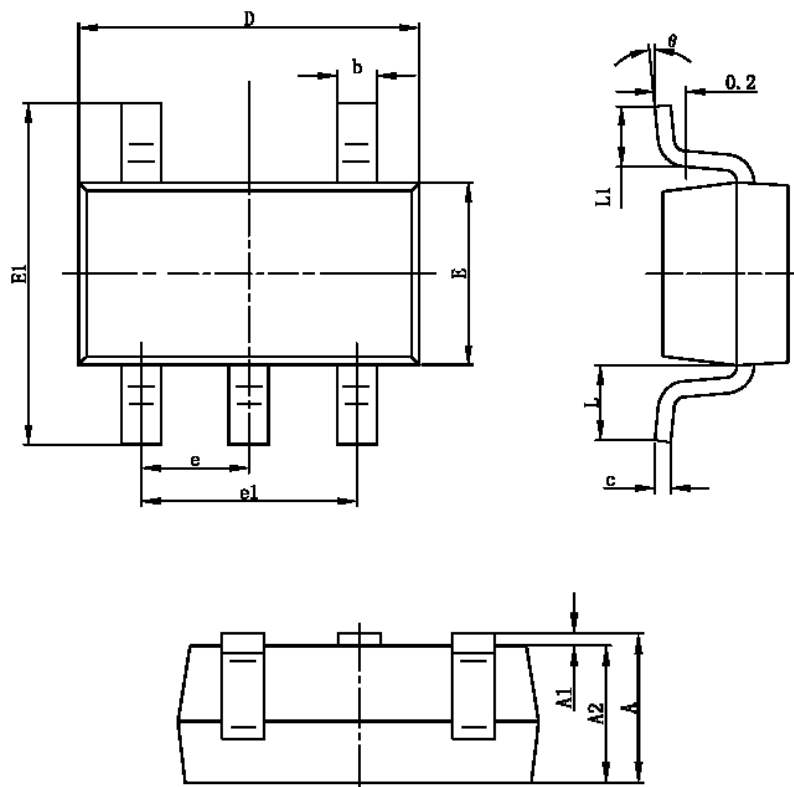
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{HV}	HV Voltage	I _r =50uA	650			V
I _{startup}	Start Up Current	V _{HV} = 30V		100	140	uA
I _C	HV Current Source	V _{HV} = 30V, V _{CC} = 0V	4.0	5.8	8.0	mA
		V _{HV} = 30V, V _{CC} = 10V	2.0	3.0	5.5	mA
		V _{HV} = 30V, V _{CC} = 12V	2.0	2.5	5.5	mA
		V _{HV} = 30V, V _{CC} = 16V	1.5	1.7	5.0	mA
		V _{HV} = 120V, V _{CC} = 16V	2.5	3.0	6.5	mA
		V _{HV} = 120V, V _{CC} = 25V	1.5	2.0	6.0	mA
V _{CC_RS}	Vcc decreasing level at which the HV Voltage Re-start	V _{HV} = 30V,		6.5		V
I _q	Quiescent Current, which HV turns- off	V _{HV} = 30V, V _{CC} = 16V		115	150	uA
V _{SENSE HI}	Sense Voltage High(logic level)		2.25		2.75	V
V _{SENSE LO}	Sense Voltage Low(logic level)				0.7	V



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SOT-23-5L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



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SYNC Power Corporation
7F-2, No.3-1, Park Street
NanKang District (NKSP), Taipei, Taiwan, 115, R.O.C
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
<http://www.syncpower.com>