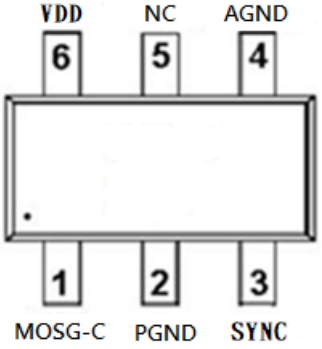
SP6016F
Synchronous Rectifier Driver

DESCRIPTION
The fundamental of SP6016F synchronous rectifier (SR) driver IC is based on our U.S. patented methods that utilize the principle of "prediction" logic circuit. The IC deliberates previous cycle timing to control the SR in present cycle by "predictive" algorithm that makes adjustments to the turn-off time, in order to achieve maximum efficiency and avoid cross-conduction at the same time. Specially, SP6016F is designed for Resonance. It also maintains the MOSFET's body diode conduction at minimum level. The SP6016F is capable to adapt in almost all existing Resonance converters with few adjustments considered necessary.

APPLICATIONS
- Switching Mode Power Supply
- Storage area network power supplies
- Telecommunication converters
- Embedded systems
- Industrial & commercial systems using high current processors
- Power converters to meet Lot 6 requirement

FEATURES
- Offers efficiency improvement over Schottky Diode.
- Low Standby Power to meet DOE Lot 6 requirement.
- Drives all logic level Power MOSFET.
- Prediction gate timing control.
- Minimum MOSFET body diode conduction.
- Operating frequency up to 300 KHz.
- Synchronize to transformer secondary voltage waveform.
- Minimum on time 0.56uS
- Internal 15KΩ resistor to GND at MOSG pin
- Internal over voltage protection

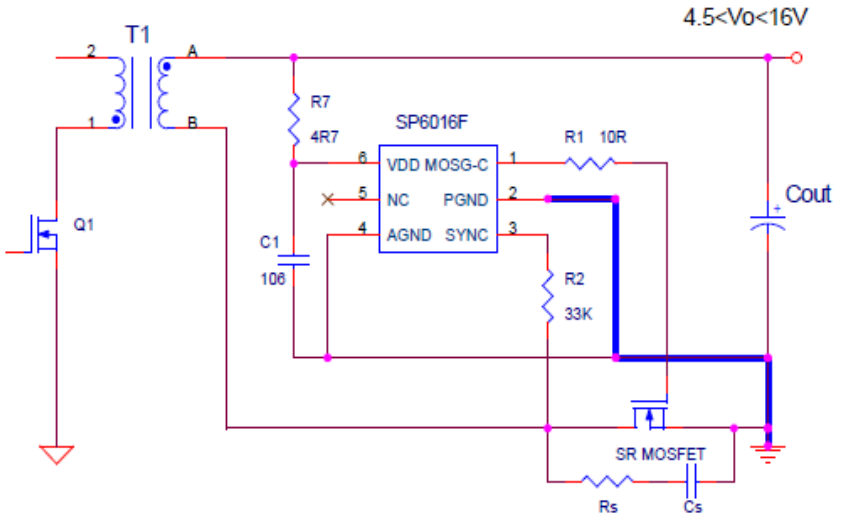
PIN CONFIGURATION (SOT-23-6L)



PART MARKING

Y : Year Code
W : Week Code

TYPICAL APPLCATION CIRCUIT

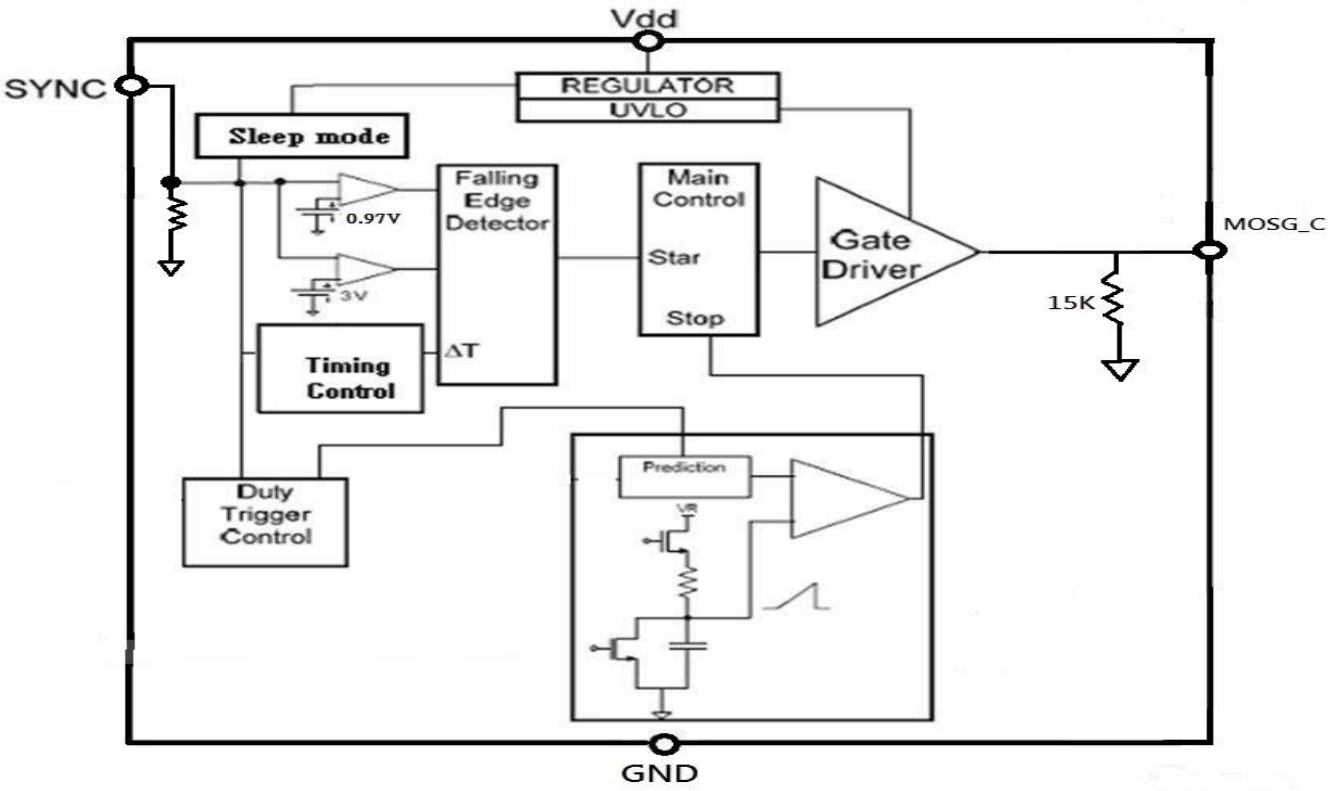


R2=33K for 12V
R2=15K for 5V

PIN DESCRIPTION

Pin	Symbol	Description
1	MOSG-C	Catch MOSFET gate drive.
2	PGND	Power Ground connection.
3	SYNC	Synchronized signal from the VDS of SR MOSFET.
4	AGND	Ground connection.
5	NC	
6	Vdd	DC supply voltage.

BLOCK DIAGRAM



ORDERING INFORMATION

Part Number	Package	Part Marking
SP6016FS26RGB	SOT-23-6L	SP6016F

※ SP6016FS26RGB : Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS (TA=25℃, unless otherwise specified.)

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

Symbol	Parameter	Value	Unit
V_{dd}	DC Supply Voltage	19	V
I_{OUT}	Peak Source Current (Pulsed)	1.0	A
	Peak Sink Current (Pulsed)	1.5	A
P_D	Power Dissipation @ T_A=85℃ (*)	0.3	W
T_J	Operating Junction Temperature Range	-40 to125	℃
T_{STG}	Storage Temperature Range	-40 to 150	℃
T_{LEAD}	Lead Soldering Temperature for 5 sec.	260	℃

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{\Theta JC}$	Thermal Resistance Junction – Case (*)	110	℃/W

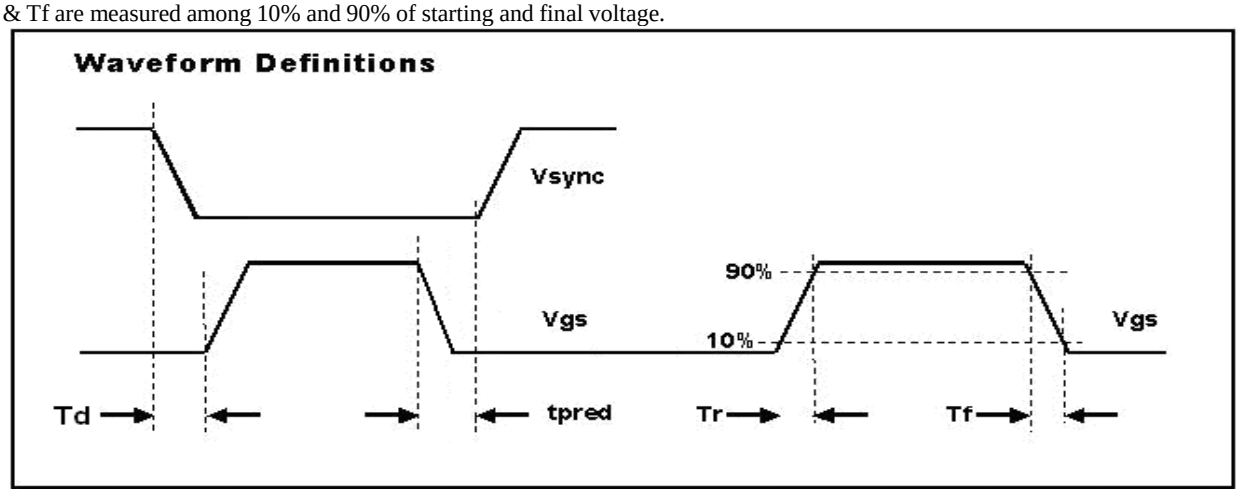
(*) The power dissipation and thermal resistance are evaluated under copper board mounted with free air conditions.

ELECTRICAL CHARACTERISTICS

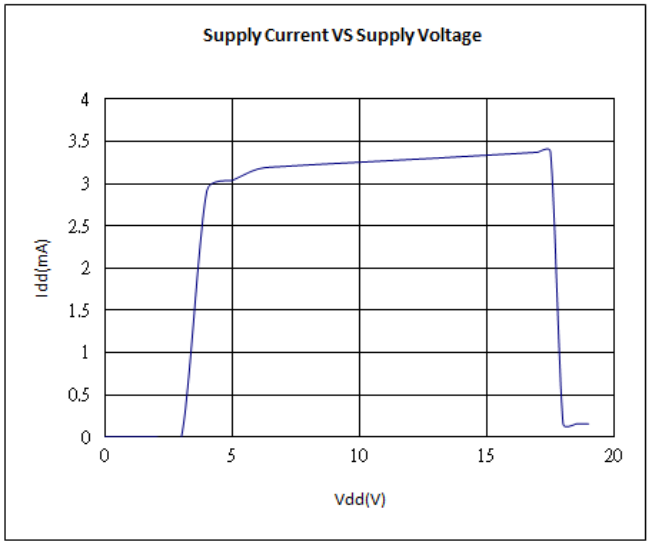
(T_A=25℃, V_{dd}=5V, Freq . =50 KHz, Duty Cycle=50%, unless otherwise specified.)

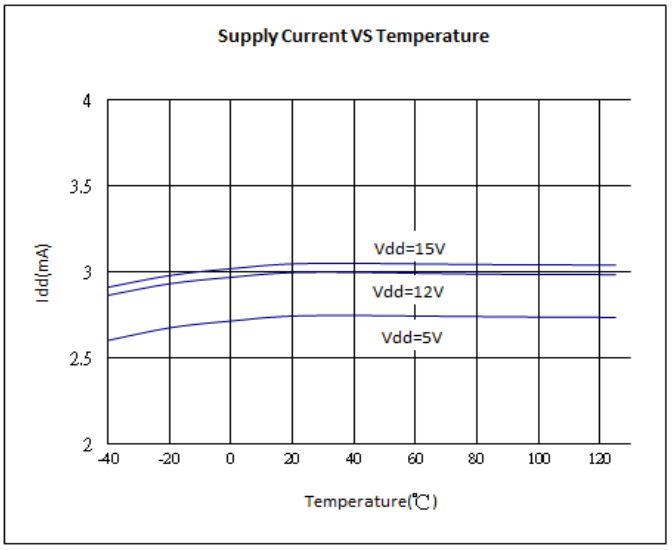
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
SUPPLY INPUT						
Idd	Supply current	Sleep mode (Vdd=5V)	0.05	0.11	0.3	mA
		V_{SYNC}=15V (Vdd=5V)		2.65		mA
Vdd	Supply voltage	Idd peak < 1A	4.3		16	V
Vdd on	Enable voltage		3.3	3.5	4.3	V
Vdd hysteresis	Enable voltage			0.2		V
Vovp	Over voltage protection		17	17.5	18.5	V
Vovp hysteresis				0.67		V
SYNC REFERENCE (SYNC)						
Vshth	SYNC high threshold			3.0		V
Vslth	SYNC low threshold			0.97		V
Vsync WK	SYNC wake-up voltage	Pulse width >1uS for Vdd=5V	6.5			V
Isync	SYNC input current				3	mA
ON TIME DUTY SETUP (MOSG-C						
Ton-time		Frequency= 10KHz-20KHz, Duty=20%~50%		25		uS
MOSFET GATE DRIVER (MOSG-C)						
Voh	Output high voltage	Io =-200mA , Vdd=12V		10.8		V
Vol	Output low voltage	Io =200mA , Vdd=12V		0.2		V
Td	Propagation delay			150		nS
Tpred	Dead time			1.0		uS
Tr	Rise time	Load = 1nF (*)		13		nS
Tf	Fall time	Load = 1nF (*)		7		nS
Dynamic Protect						
Dt	Dynamic variable			5.3		uS
Ton-min	MOSG-C on time	PWM adjusts time > Dt		0.56	0.6	uS

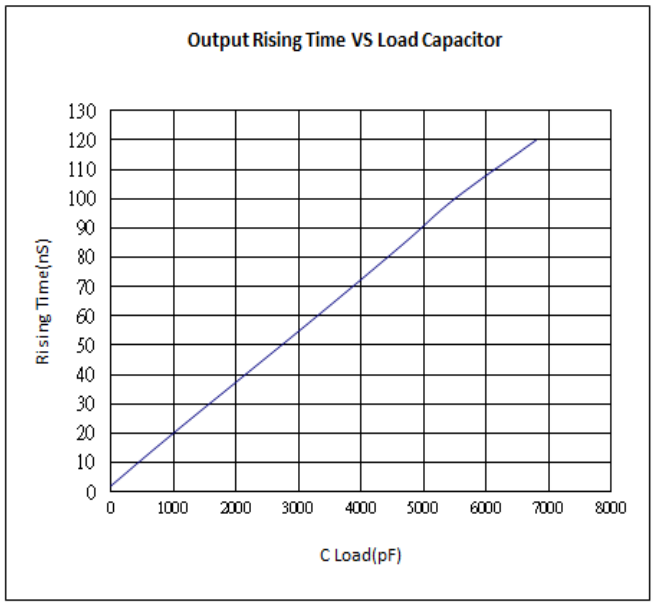
(*) Tr & Tf are measured among 10% and 90% of starting and final voltage.

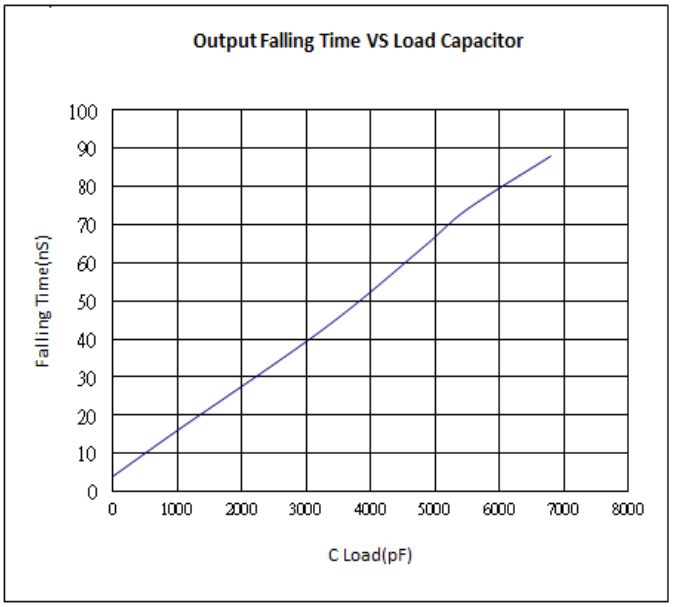


TYPICAL CHARACTERISTICS









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