DESCRIPTION

JX5300 is an Over-Voltage-Protection (OVP) and Over-Current-Protection (OCP) device. It can disconnect IN to OUT to protect load in case wrong input operating conditions are detected. The system is positive over voltage protected up to 36V. The internal over voltage thresholds (OVLO) is 6.1V and internal over current thresholds (OCP) is 2.3A.

JX5300 also has internal over temperature protect (OTP) function and it can monitor chip temperature to protect the device.

The JX5300 is available in SOT23-6L package. Standard products are Pb-free and Halogen-free.

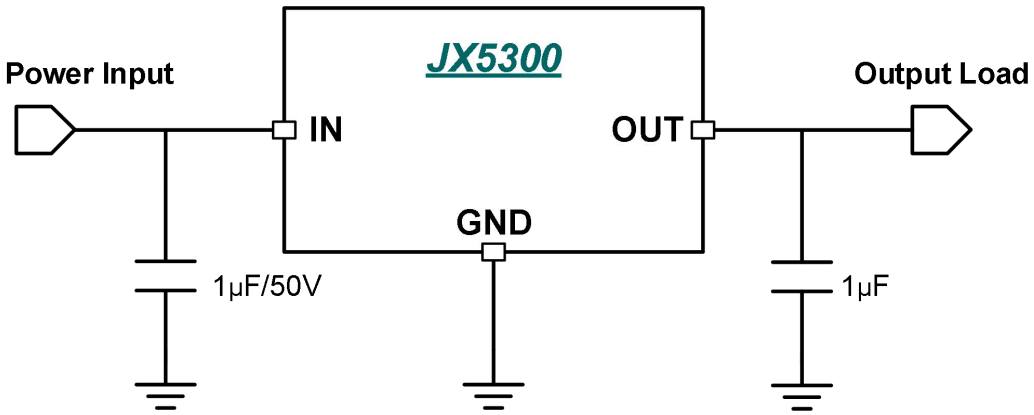
FEATURES

- Typical R_{ON}: 130mΩ N-Channel MOSFET @5V/1A
- Maximum Output Current: 2.0A.
- Maximum input voltage: 36V
- Internal Over voltage Lockout : 6.1V
- Internal Over current Lockout : 2.3A(TYP @T_A= 25℃)
- Over voltage-Protection Response Time：50ns(TYP.)
- Startup Debounce Time: 14ms (TYP.)
- Typical Output Power on Time: 1.4ms (TYP.)
- Internal Thermal-Shutdown Protection
- ESD Protected: Human Body Model：JESD22-A114 (All pins)±2KV
- SOT23-6L

APPLICATIONS

- GPS
- PMP
- MID
- PAD
- Digital cameras
- Digital Videos

TYPICAL APPLICATION CIRCUIT

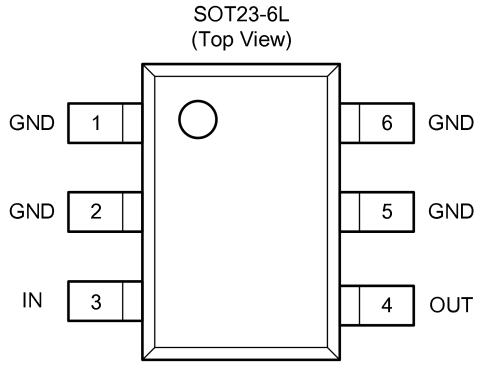


ORDER INFORMATION

Part Number	Package	Marking	Packing Option
JX5300MR-G	SOT23-6L	JX5300 XXYY	Tape and Reel, 3000

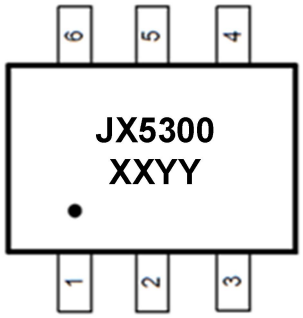
Note: XXYY is Date code，XX is year code, YY is week code.

PIN CONFIGURATION/ DESCRIPTION



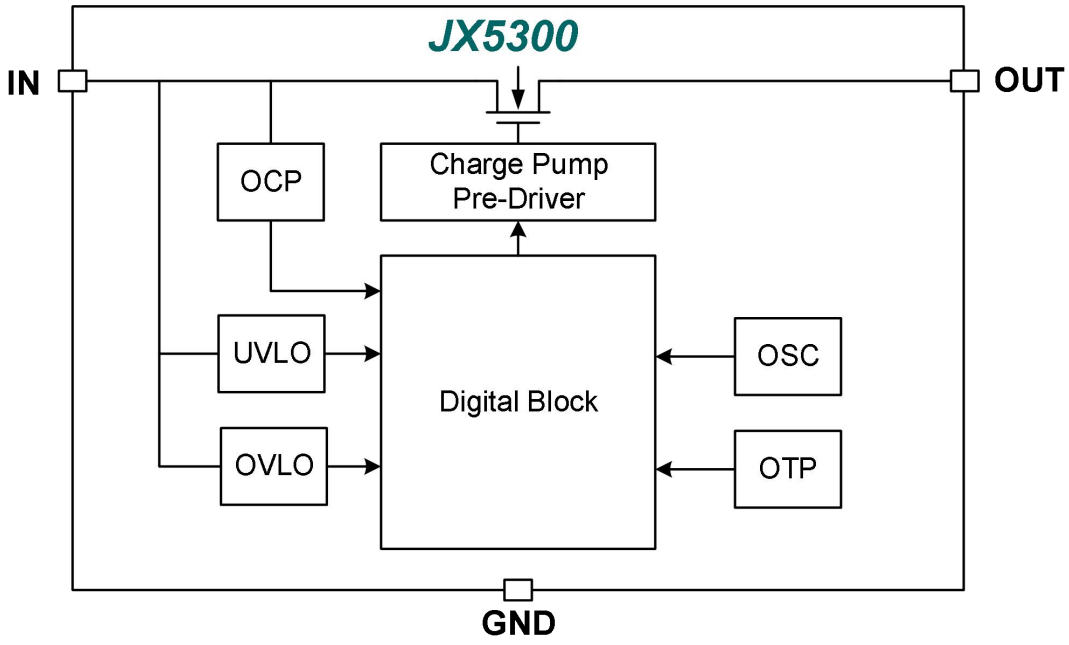
Pin	Name	Description
1,2,5,6	GND	Ground.
3	VIN	Input pin.
4	VOUT	Output pin.

MARKING RULE



JX5300 = Device code
XXYY = Date Code

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

(Note: Exceeding these limits may damage the device. Exposure to absolute maximum rating conditions for long periods may affect device reliability.)

PARAMETER	SYMBOL	MIN	MAX	UNIT
IN to GND	V_{IN}	-0.3	36	V
OUT to GND	V_{OUT}	-0.3	15	V
Maximum Continuous Current of switch IN-OUT	I_{SW1}	—	2.0	A
Maximum Peak Current of switch IN-OUT(10ms)	I_{SW2}	—	2.3	A
Power Dissipation (SOT-23-6L, T_A= +25℃)	P_D	—	0.45	W
Thermal resistance(SOT-23-6L)	θ_{JA}	—	250	℃/W
Storage Temperature Range &Junction Temperature	T_{stg},T_J	-65	+150	℃
Operating Temperature Range	T_A	-40	+85	℃
ESD HBM (Human Body Mode)	2000			V

ELECTRICAL CHARACTERISTICS

(Unless otherwise noted, typical values are at V_{IN}=5V and T_A=25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Basic Operation						
Input Voltage	V_{IN}		2.5	-	36	V
V_{IN} Quiescent Current	I_Q	V_{EN}=Low, OUT floating	-	130	-	μA
On-Resistance of Switch IN-OUT	R_{ON}	V_{IN}=5.0V, I_{OUT}=1A	-	130	150	mΩ
Output discharge resistance	$R_{DISCHARGE}$	V_{IN}=5.0V	-	2.7	-	KΩ
Over Voltage Lockout Threshold	V_{OVLO}	V_{IN} Rising	5.9	6.1	6.3	V
Over Voltage Lockout hysteresis	$V_{OVLO-HYS}$	V_{IN} Falling	-	210	-	mV
Under Voltage Lockout Threshold	V_{UVLO}	V_{IN} Rising	-	2.4	-	V
Under Voltage Lockout hysteresis	$V_{UVLO-HYS}$	V_{IN} Falling	-	180	-	mV
Input Over						
Debounce Time	t_{DEB}	Time from 2.3V<V_{IN}< V_{OVLO} to V_{OUT}=10% of V_{IN}	12	14	16	ms
Switch Turn-On Time	t_{ON}	R_L=100Ω, C_L=22μF, V_{OUT} from 0.1×V_{IN} to 0.9×V_{IN}	-	1.4	-	ms
Output power-on Time	t_{ON_ALL}	Time from 2.1V<V_{IN}< V_{OVLO} to V_{OUT}=90% of V_{IN}	-	15.4	-	ms
Switch turn-off response time	t_{OFF_RES} (1)	V_{IN} > V_{OVLO} to V_{OUT} stop rising	-	50	-	ns

Dynamic Characteristics: see figure						
OCP LIMIT Current	$I_{OCP-LIMIT}$		2.0	2.3	-	A
OCP debounce time	t_{OCP}		-	20	-	ms
OCP recovery time	T_{REC_OCP}		-	800	-	ms
Over Temperature Protection（OTP）						
Thermal Shutdown	V_{OTP}		-	155	-	℃
Thermal-shutdown Hysteresis	$V_{OTP-HYS}$		-	25	-	℃

Note:

(1)、Guaranteed by characterization and design.

TYPICAL OPERATING PERFORMANCE

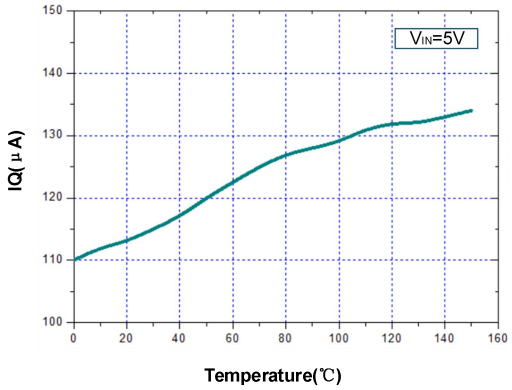


Figure1: IQ vs Temperature

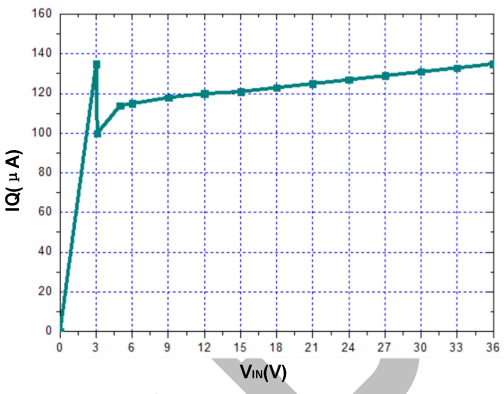


Figure2: I_Q vs V_{IN}

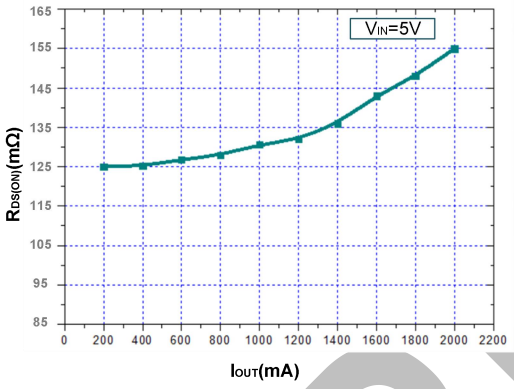


Figure3: $R_{DS(ON)}$ vs I_{OUT}

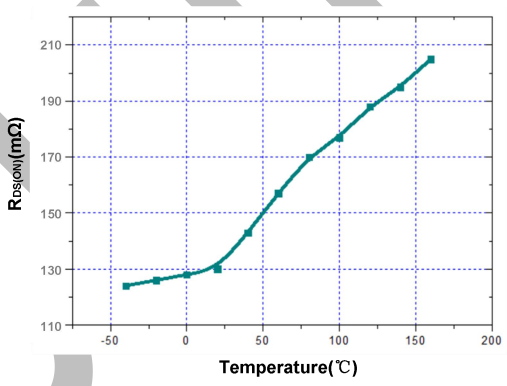


Figure4: $R_{DS(ON)}$ vs Temperature

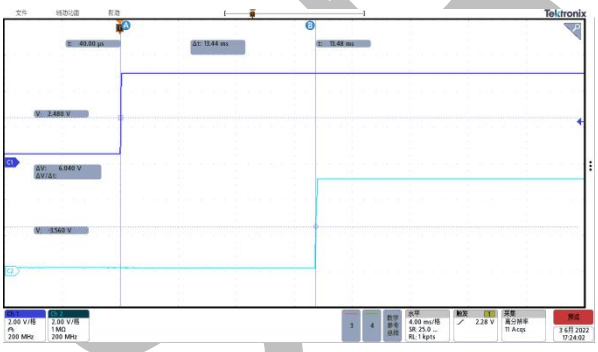


Figure5: Power on Debounce Time, T_{DEB}=13.44ms

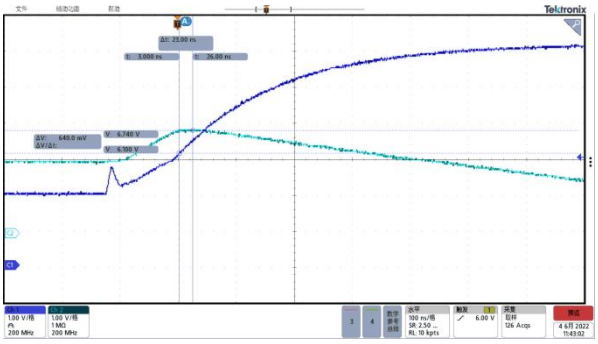


Figure6: OVP Response time, T_{OFF_RES}=23ns

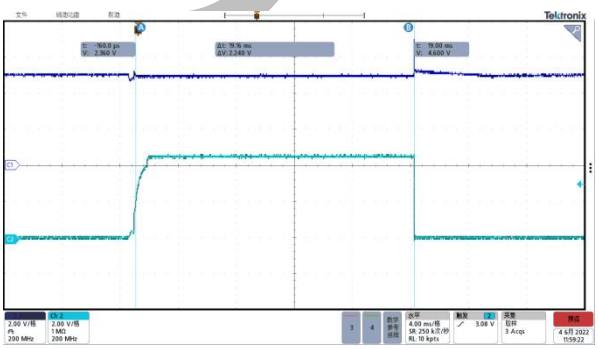


Figure7: OCP debounce time, T_{OCP}=19.16ms

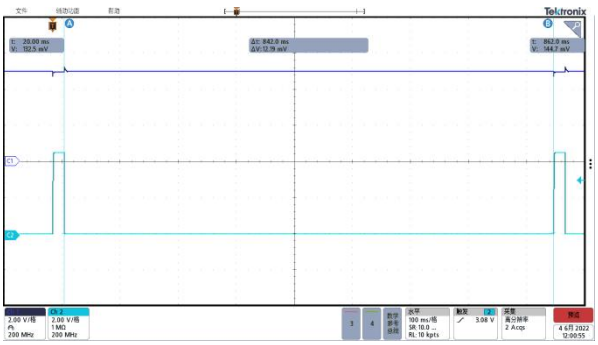
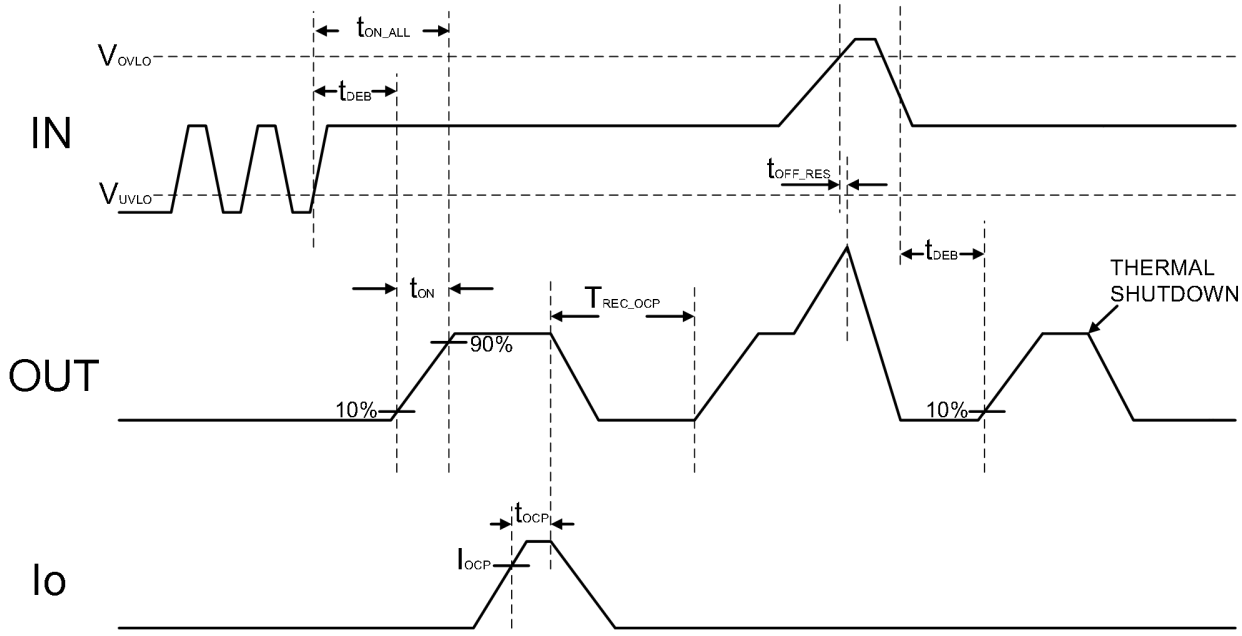


Figure8: OCP recovery time, T_{REC_OCP}=842.0ms

AC ELECTRICAL CHACRACTERISTICS

(V_{IN}= 5V, unless otherwise specified. Typical values are at T_A= 25℃.)



*NOTE: WAVEFORMS ARE NOT TO SCALE

FUNCTIONAL DESCRIPTION

The OVP switch with over voltage protection feature a low 130mΩ (typical) on-resistance (R_{ON}) internal FET and protect low-voltage systems against voltage faults up to 36V_{DC}. If the input voltage (V_{IN}) exceeds 6.1V, or input current exceeds 2.0A, the internal FET is quickly turned off to prevent damage to the protected downstream components.

The internal FET turns off when the junction temperature exceeds +155ºC (TYP.). The device exits thermal shutdown after the junction temperature cools by 25ºC (TYP.).

Input Capacitor

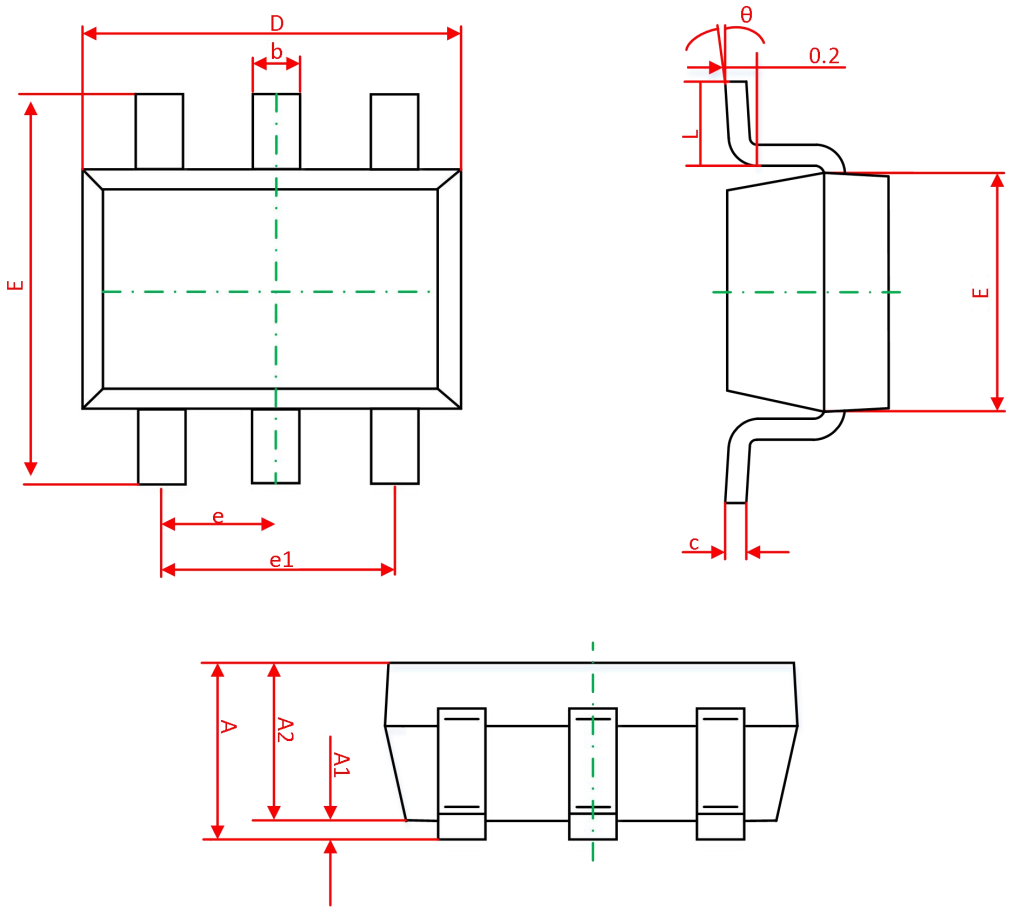
To limit the voltage drop on the input supply caused by transient inrush current when the switch turns on into a discharged load capacitor or short-circuit, a capacitor 1μF or lager must be placed between the VIN and GND pins.

Output Capacitor

A 1μF or lager capacitor should be placed between the OUT and GND pins.

PACKAGE INFORMATION

- **SOT23-6L**



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	0.500	0.012	0.020
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	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°