

JTMS9601

Primary Sensing AC-DC Off-line Controller with Base-Sense Technology

●DESCRIPTION:

JTMS9601 IS is an AC-DC primary-sensing off-line controller. There needs only very few external components to build a low cost switching power supply with this 3-pin controller. The patented Base-Sense technology incorporates the output driving feature and the input current sensing function together into the shared B/S pin.



●FEATURES:

- Primary sensing eliminates photo-coupler.
- Single-chip controller with the least external components
- Patented Base-Sense technology to sharing the B/S pin
- Self oscillation eases the coil transformer design with less requirement in precision.
- Constant output power
- Tight constant voltage regulation $< \pm 5\%$.
- Universal AC input range
- Over-voltage protection

●APPLICATION:

- Isolated AC-DC power regulator, such as USB chargers, power adapters for both handheld devices and household electrical appliances.
- Isolated LED Power Driver

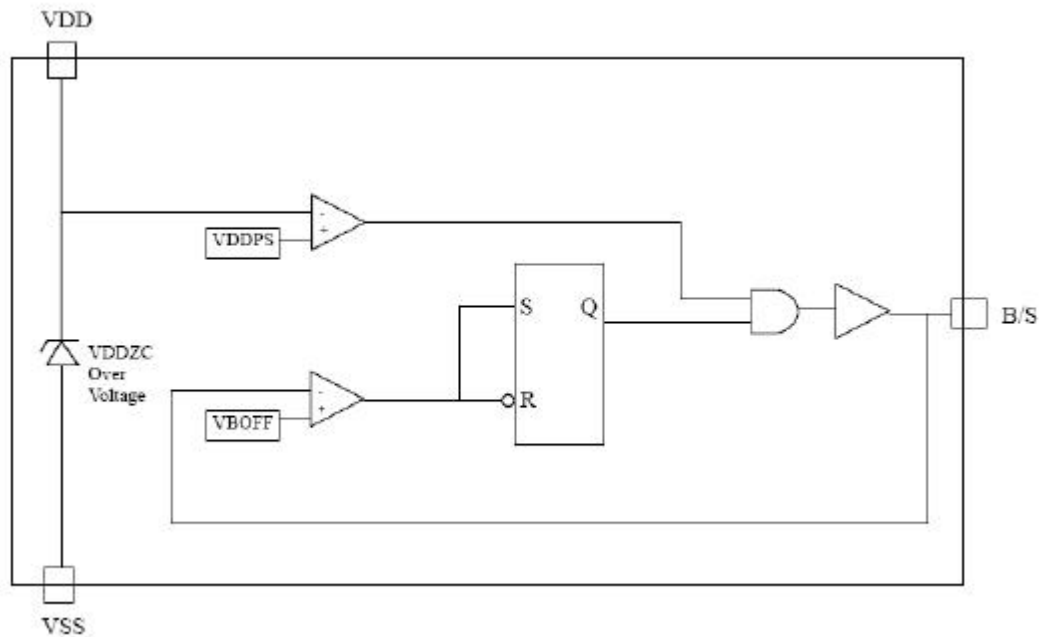
●ORDER INFORMATION:

PACKING	ORDERING CODE
TO-92/NORMAL PACKING	JTMS9601 TO-92
TO-92/AMMOPACK	JTMS9601 TO-92-AP
SOT23-3	JTMS9601 SOT23-3

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●BLOCK DIAGRAM:



●PIN ASSIGNMENT

Pin	Pin Name
1	VDD
2	B/S
3	VSS

TO92



SOT23-3



●PIN DESCRIPTION

Pin	Pin Name	Description
1	VDD	Supply of the controller unit
2	B/S	Base of the controller unit
3	VSS	Ground of the controller unit

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●ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings:

PARAMETER	SYMBOL	LIMITS		UNIT
		MIN	MAX	
Supply Voltage	V_{DD}	-0.3	9.5	V
Input Current	I_{DD}	-	10	mA
B/S pin Input voltage	V_B	-0.3	$V_{DD}+0.3$	V
Operating Junction Temperature	T_J	-40	125	°C
Storage Temperature	T_{STJ}	-55	150	°C

Absolute maximum ratings are the values beyond which the safety of the device cannot be guaranteed

Supply Unit Characteristics

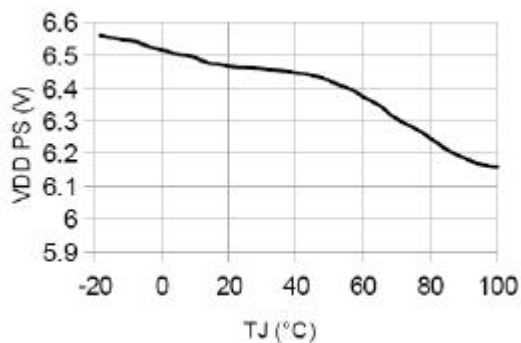
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
Operation Supply Voltage	V_{DD}		3.5	-	6.6	V
V_{DD} Clamped Over Voltage	V_{DDZC}	$I_{DD}=10mA$	7.2	-	-	V
V_{DD} Primary Sensing Threshold #1	V_{DDPS}		6.2	6.4	6.6	V
Peak Current Shut Off Threshold Voltage at Pin B/S	V_{BOFF}		3.5	4.0	4.5	V
Operating Supply Current No Switching	I_{DD0}	$V_{DD}>V_{DDPS}$ $V_B=0V$	-	500	600	uA
Operating Supply Current Switching	I_{DD1}	$V_{DD}<V_{DDPS}$ $V_B>0.5V$	-	2.5	4.0	mA

Note: $V_{DD}=6.4$, $T_J=25^{\circ}C$, unless otherwise specified.

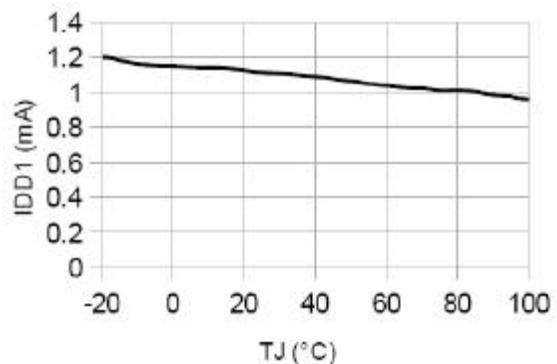
#1 The actual figure of V_{DDPS} is subject to change as per production lot.

●TYPICAL ELECTRICAL CHARACTERISTICS:

VDD Primary Sensing Threshold Voltage
vs Junction Temperature



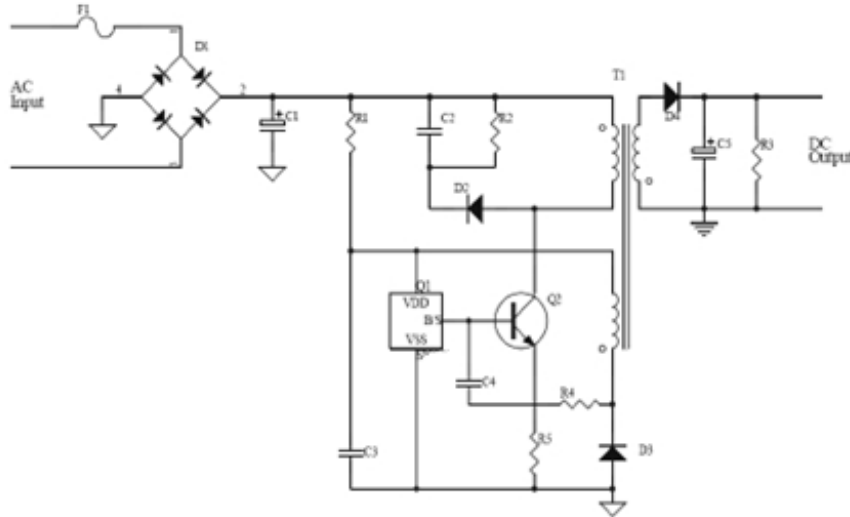
IDD Switching Operating Voltage
vs Junction Temperature
 $V_{DD} = 6.4V$



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●TYPICAL APPLICATION DIAGRAM:



●ESTIMATION OF OUTPUT VOLTAGE&POWER:

Output Voltage

$$V_s \approx 6.4 \times \frac{N_s}{N_a} - V_{D4}$$

Where N_s is the number of turns of the secondary winding,

N_a is the number of turns of the auxiliary winding ,and

V_{D4} is the forward voltage of the D4 diode.

$$\text{Output Power } P_o \text{ * at AC220} \approx \frac{1.95}{R} \times \frac{1}{0.0064 + \frac{N_s}{N_p \cdot V_s}}$$

$$\text{Output Power } P_o \text{ * at AC110} \approx \frac{1.95}{R} \times \frac{1}{0.0127 + \frac{N_s}{N_p \cdot V_s}}$$

Where R is the value of R5 resistor,

N_p is the number of turns of the primary winding ,

N_s is the number of turns of the secondary winding,and

V_s is the output voltage on the secondary side.

*remark:the power loss in T1 R3 R5 and D4 are not calculated in this equation.

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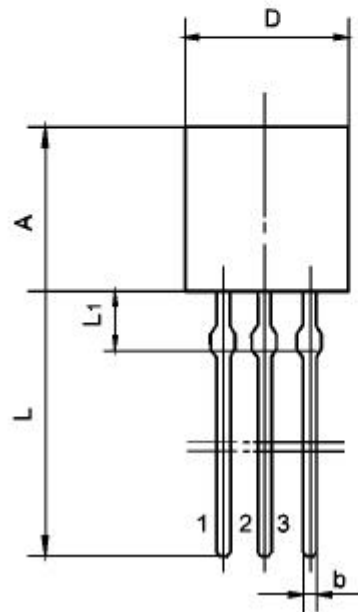
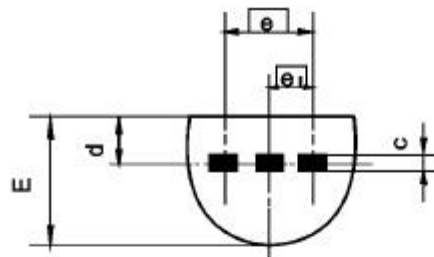
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●:PACKAGE DIMENSTIONS

TO-92 MECHANICAL DATA

UNIT: mm

SYMBOL	min	nom	max
A	4.30		5.30
b	0.30		0.55
c	0.30		0.50
ϕD	4.30		5.20
d	1.00		1.70
E	3.20		4.20
e		2.54	
e1		1.27	
L	12.70		15.00
L1	1.50		2.00



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SOT23-3 MECHANICAL DATA

UNIT: mm

DIMENSIONS	MIN	MAX	DIMENSIONS	MIN	MAX
A	2.80	3.00	C	0.75	0.90
A1	1.80	2.00	C1	0.535	0.585
A2	0.96(TYP)		C2	0.365	0.415
A3	0.20	0.40	C3	0.01	0.11
A4	0.30	0.50			
A5	2.34	2.50	R	0.10(TYP)	
A6	0.30	0.50	R1	0.10(TYP)	
B	1.25	1.35	R2	0.10(TYP)	
B1	0.265	0.315			
B2	0.01	0.11	Θ 1	6°-8 (TYP)	
B3	0.10(TYP)		Θ 2	5°(REF)	
B4	0.254(TYP)		Θ 3	1°-7 (TYP)	

