



## UC3383

CMOS IC

### PFM CONTROLLED, STEP-UP DC/DC CONVERTERS (VARIABLE DUTY RATIO)

#### DESCRIPTION

The UTC **UC3383** Series are PFM step-up DC/DC switching converter. The UTC **UC3383** can support both large and small currents. It automatically switches duty ratio (45%/75%) when it senses changes in load.

Both built-in and external transistor types include 5-pin and 3-pin packages, which are provided with either a CE (chip enable) function that reduces power consumption during shut-down mode, or a  $V_{DD}$  pin function (separated power and voltage detect pins).

#### FEATURES

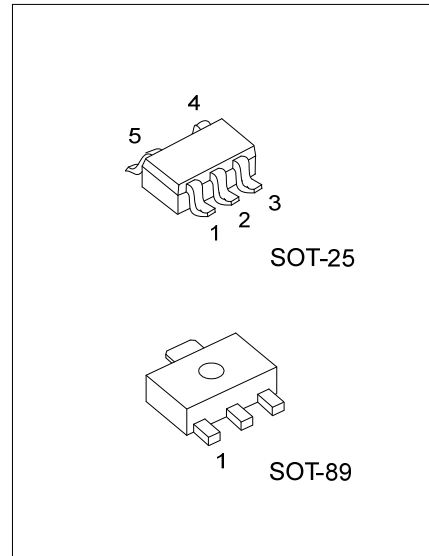
- \* Output Voltage Range: 2.0V~7.0V in 0.1V Increments
- \* Operating (Start-up) Voltage Range: 0.9V~10V
- \* Highly Accurate: Set-up Voltage  $\pm 2.5\%$
- \* Maximum Oscillator Frequency (Max Fosc1): 180kHz ( $\pm 15\%$ )
- \* Variable Duty Ratio: 45%/75% ( $\pm 5\%$ )
- \* Both Switching Transistor Built-in and External Types are Available
- \* 5-Lead Package Offer Chip Enable or Independent  $V_{OUT}$  Pin Option.

#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
UC3383L-xx-AB3-R	UC3383G-xx-AB3-R	SOT-89	$V_{SS}$	$V_{OUT}$	Lx	-	-	Tape Reel
UC3383L-xx-AF5-R	UC3383G-xx-AF5-R	SOT-25	CE	$V_{OUT}$	NC	$V_{SS}$	Lx	Tape Reel

Note: Pin Assignment: NC: No Connection CE: Chip Enable  
xx: Output Voltage, refer to Marking Information.

<p>UC3383G-xx-AB3-R</p>	<p>(1) R: Tape Reel</p> <p>(2) AB3: SOT-89, AF5: SOT-25</p> <p>(3) xx: refer to Marking Information</p> <p>(4) G: Halogen Free and Lead Free, L: Lead Free</p>
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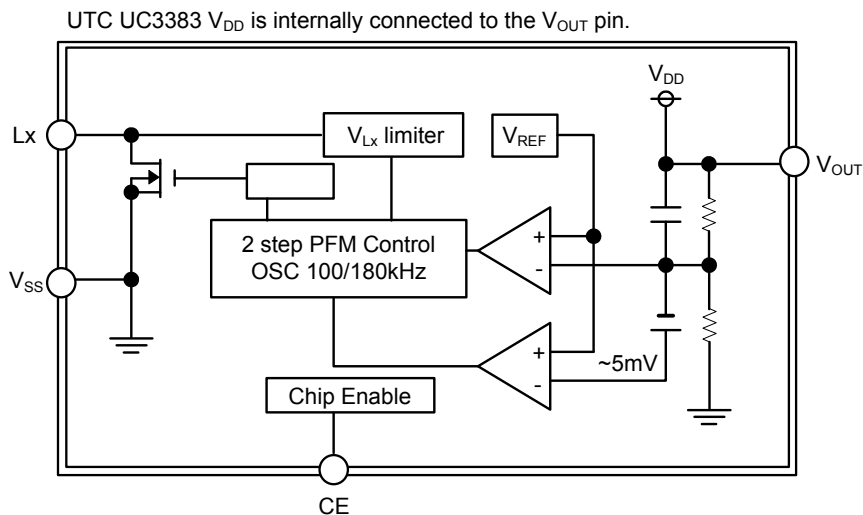
### MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	20:2.0V	
	25:2.5V	
	26:2.6V	
	27:2.7V	
	28:2.8V	
	30:3.0V	
	31:3.1V	
	32:3.2V	
	33:3.3V	
	36:3.6V	
SOT-89	37:3.7V	
	40:4.0V	
	45:4.5V	
	50:5.0V	

### PIN DESCRIPTION

PIN NO.		PIN NAME	FUNCTION
SOT-25	SOT-89		
1	-	CE	Chip Enable
2	2	V <sub>OUT</sub>	Output voltage monitor, IC internal power supply
3	-	NC	No Connection
4	1	V <sub>SS</sub>	Ground
5	3	Lx	Switch

### BLOCK DIAGRAM



Note: The CE pin is only used with the 5-Lead Package.

■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
V <sub>OUT</sub> Input Voltage		V <sub>OUT</sub>	12	V
Lx pin Voltage		V <sub>LX</sub>	12	V
CE Input Voltage		V <sub>CE</sub>	12	V
V <sub>DD</sub> Input Voltage		V <sub>DD</sub>	12	V
Lx pin Current		I <sub>LX</sub>	400	mA
Power Dissipation	SOT-89	P <sub>D</sub>	500	mW
	SOT-25		250	mW
Operating Junction Temperature		T <sub>J</sub>	+125	°C
Ambient Operating Temperature		T <sub>OPR</sub>	-30 ~ +80	°C
Storage Temperature		T <sub>STG</sub>	-40 ~ +125	°C

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, V<sub>IN</sub>=V<sub>OUT</sub>× 0.6, unless otherwise specified)

**UTC UC3383-2.0V** (I<sub>OUT</sub>=10mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	1.950	2.000	2.050	V
Maximum Input Voltage		V <sub>IN</sub>				10	V
Oscillation Start-up Voltage		V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage		V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage		V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>OSC1</sub> ×2	0.7		1.1	V
No-Load Input Current		I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.3	8.6	μA
Supply Current 1(Note 2)		I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		13.6	27.3	μA
Supply Current 2		I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		1.9	3.9	μA
Lx Leakage Current		I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>LX</sub> =10V.			1.0	μA
Lx Switch-On Resistance		R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>LX</sub> =0.4V		9.1	13.7	Ω
Duty Ratio 1		DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	50	55	60	%
Efficiency		EFF1	L, SD, C <sub>L</sub> etc. connected		70		%
Maximum Oscillation Frequency		F <sub>OSC1</sub>	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
		F <sub>OSC2</sub>	Same as I <sub>DD1</sub> . 45% duty	150	180	210	
<b>FOR 5-PINS PACKAGE ONLY</b>							
CE Voltage		High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75		V
		Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20
CE "High" Current		High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95		0.25	μA
		Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V		-0.25	μA
Stand-by Current			I <sub>STB</sub>	Same as I <sub>DD1</sub> .		0.5	μA

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### UTC UC3383-2.5V (I<sub>OUT</sub>=10mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	2.438	2.500	2.563	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>OSC</sub> 1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.45	8.95	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		16.65	33.35	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.0	4.05	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		7.15	10.8	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFFI	L, SD, C <sub>L</sub> etc. connected		70		%
Maximum Oscillation Frequency	F <sub>OSC1</sub>	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	F <sub>OSC2</sub>	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

### UTC UC3383-2.6V (I<sub>OUT</sub>=10mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	2.535	2.600	2.665	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>OSC</sub> 1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.48	9.02	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		17.26	34.56	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.02	4.08	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		6.76	10.22	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFFI	L, SD, C <sub>L</sub> etc. connected		70		%
Maximum Oscillation Frequency	F <sub>OSC1</sub>	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	F <sub>OSC2</sub>	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### UTC UC3383-2.7V (I<sub>OUT</sub>=10mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	2.633	2.700	2.768	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>OSC1</sub> ×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.51	9.09	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		17.87	35.77	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.04	4.11	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>LX</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>LX</sub> =0.4V		6.37	9.64	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		70		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

### UTC UC3383-2.8V (I<sub>OUT</sub>=10mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	2.730	2.800	2.870	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>OSC1</sub> ×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.54	9.16	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		18.48	36.98	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.06	4.14	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>LX</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>LX</sub> =0.4V		5.98	9.06	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		70		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

■ ELECTRICAL CHARACTERISTICS (Cont.)

**UTC UC3383-3.0V** (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	2.925	3.000	3.075	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>osc1</sub> ×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.6	9.3	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		19.7	39.4	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.1	4.2	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		5.2	7.9	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFFI	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

**FOR 5-PINS PACKAGE ONLY**

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

**UTC UC3383-3.1V** (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	3.023	3.100	3.178	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>osc1</sub> ×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.635	9.365	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		20.3	40.6	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.115	4.23	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		5.08	7.72	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFFI	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

**FOR 5-PINS PACKAGE ONLY**

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### UTC UC3383-3.2V (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	3.120	3.200	3.280	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >Fosc1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.67	9.34	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		20.9	41.8	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.13	4.26	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>LX</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>LX</sub> =0.4V		4.96	7.54	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	
<b>FOR 5-PINS PACKAGE ONLY</b>						
CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75		V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation		0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95		0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V		-0.25	μA
Stand-by Current	I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

### UTC UC3383-3.3V (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	3.218	3.300	3.383	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >Fosc1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.705	9.41	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		21.5	43	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.145	4.29	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>LX</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>LX</sub> =0.4V		4.84	7.36	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	
<b>FOR 5-PINS PACKAGE ONLY</b>						
CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75		V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation		0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95		0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V		-0.25	μA
Stand-by Current	I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### UTC UC3383-3.6V (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	3.510	3.600	3.690	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >Fosc1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.81	9.62	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		23.3	46.6	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.19	4.38	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		4.48	6.82	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

### UTC UC3383-3.7V (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	3.608	3.700	3.793	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LXLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >Fosc1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.845	9.755	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		23.9	47.8	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.205	4.41	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		4.36	6.64	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA



## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### UTC UC3383-4.0V (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	3.900	4.000	4.100	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LxLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >Fosc1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		4.95	9.94	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		25.7	51.4	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.25	4.5	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		4.0	6.1	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

### UTC UC3383-4.5V (I<sub>OUT</sub>=30mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	4.388	4.500	4.613	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LxLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >Fosc1×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		5.125	10.25	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		28.8	57.6	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		2.325	4.65	μA
Lx Leakage Current	I <sub>LXL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		3.4	5.2	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		80		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz

### FOR 5-PINS PACKAGE ONLY

CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75			V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95			0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V			-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .			0.5	μA

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### UTC UC3383-5.0V (I<sub>OUT</sub>=50mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	L, SD, C <sub>L</sub> etc. connected	4.875	5.000	5.125	V
Maximum Input Voltage	V <sub>IN</sub>				10	V
Oscillation Start-up Voltage	V <sub>ST</sub>	I <sub>OUT</sub> =1mA		0.80	0.90	V
Oscillation Hold Voltage	V <sub>HLD</sub>	I <sub>OUT</sub> =1mA	0.70			V
Lx Limit Voltage	V <sub>LxLMT</sub>	Same as I <sub>DD1</sub> . F <sub>OSC</sub> >F <sub>osc1</sub> ×2	0.7		1.1	V
No-Load Input Current	I <sub>IN</sub>	I <sub>OUT</sub> =0mA (Note 1)		5.3	10.6	μA
Supply Current 1(Note 2)	I <sub>DD1</sub>	V <sub>IN</sub> =V <sub>OUT</sub> ×0.95		31.7	63.4	μA
Supply Current 2	I <sub>DD2</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +0.5V		4.0	8.0	μA
Lx Leakage Current	I <sub>LxL</sub>	No external components, V <sub>OUT</sub> =V <sub>Lx</sub> =10V.			1.0	μA
Lx Switch-On Resistance	R <sub>SWON</sub>	Same as I <sub>DD1</sub> . V <sub>Lx</sub> =0.4V		2.8	4.3	Ω
Duty Ratio 1	DTY1	Same as I <sub>DD1</sub> . Measuring of Lx waveform	70	75	80	%
Duty Ratio 2	DTY2	I <sub>OUT</sub> =1mA. Measuring of Lx on-time	40	45	50	%
Efficiency	EFF1	L, SD, C <sub>L</sub> etc. connected		85		%
Maximum Oscillation Frequency	Fosc1	Same as I <sub>DD1</sub> . 75% duty	100	120	130	kHz
	Fosc2	Same as I <sub>DD1</sub> . 45% duty	150	180	210	kHz
<b>FOR 5-PINS PACKAGE ONLY</b>						
CE Voltage	High	V <sub>CEH</sub>	Same as I <sub>DD1</sub> . Existence of Lx Oscillation.	0.75		V
	Low	V <sub>CEL</sub>	Same as I <sub>DD1</sub> . Disappearance of Lx Oscillation		0.20	V
CE "High" Current	High	I <sub>CEH</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =V <sub>OUT</sub> ×0.95		0.25	μA
	Low	I <sub>CEL</sub>	Same as I <sub>DD1</sub> . V <sub>CE</sub> =0V		-0.25	μA
Stand-by Current		I <sub>STB</sub>	Same as I <sub>DD1</sub> .		0.5	μA

- Note: 1. The Schottky diode (SD) must be type MA735, with reverse current(I<sub>R</sub>)<1.0μA at reverse voltage (V<sub>R</sub>) =10V.  
 2. "Supply Current 1" is the supply current while the oscillator is continuously oscillating. The current actually provided by an external V<sub>IN</sub> source is represented by "No-Load Input Current (I<sub>IN</sub>)".

■ TYPICAL APPLICATION CIRCUITS

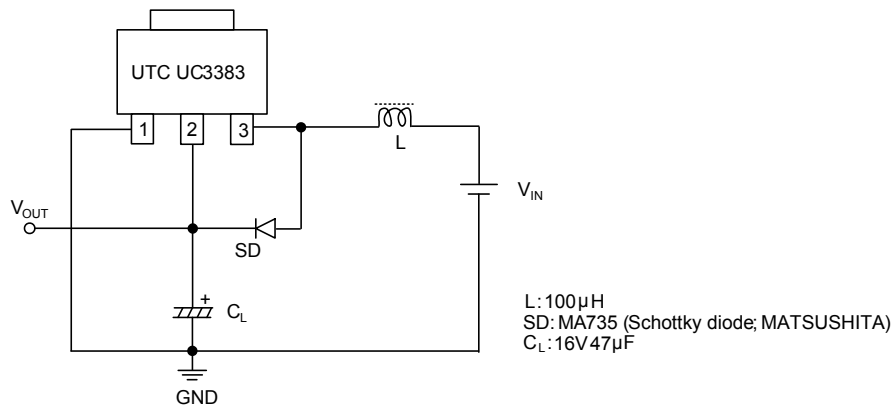


Fig.1 3-Lead Package Application(SOT-89)

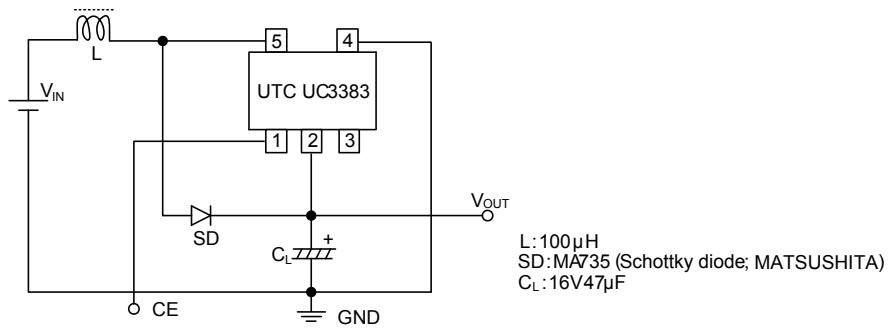
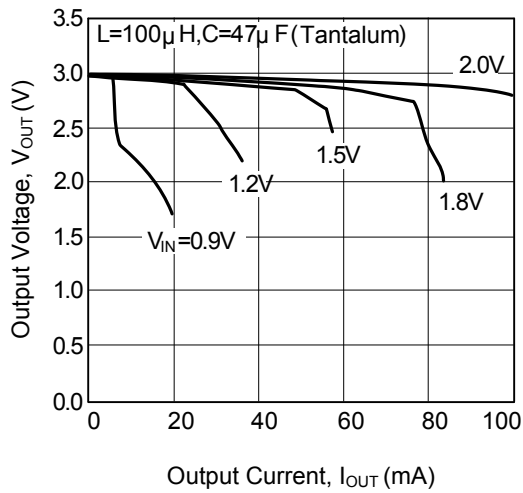


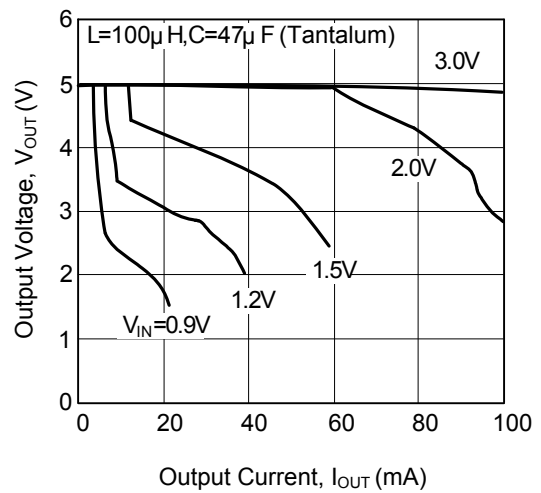
Fig.2 5-Lead Package Application(SOT-25)

■ TYPICAL CHARACTERISTICS (BUILT-IN SWITCHING TRANSISTOR)

(1) OUTPUT VOLTAGE vs. OUTPUT CURRENT  
L3383-3.0V

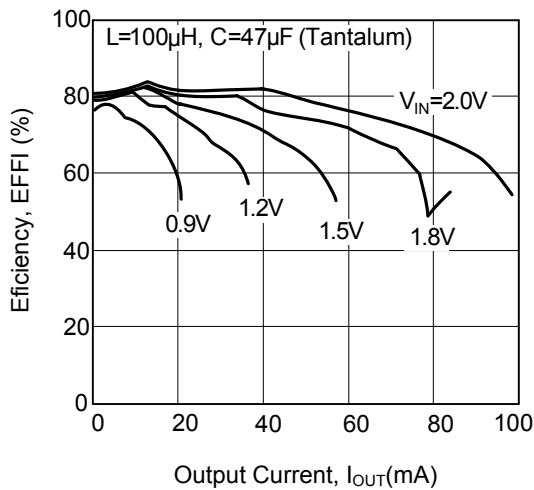


L3383-5.0V

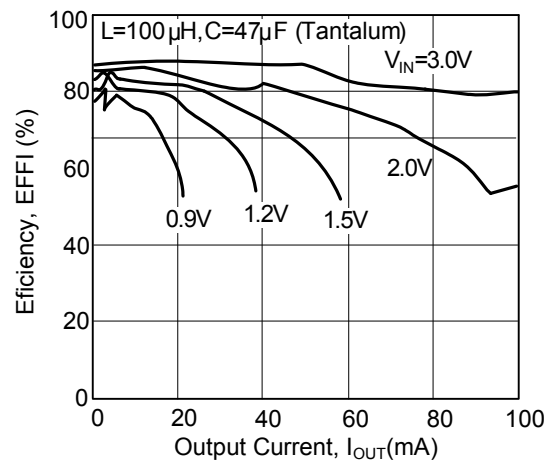


(2) EFFICIENCY vs. OUTPUT CURRENT  
(3)

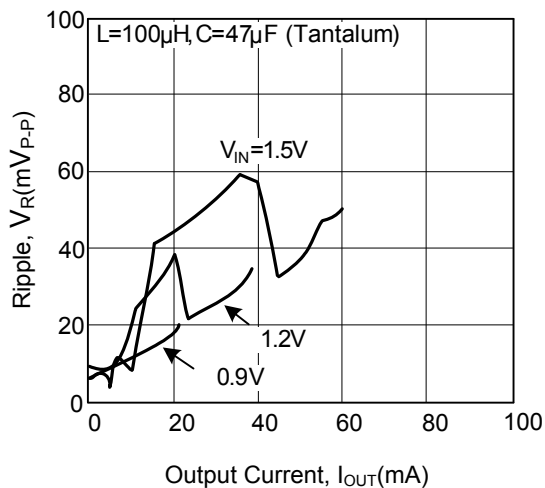
L3383-3.0V



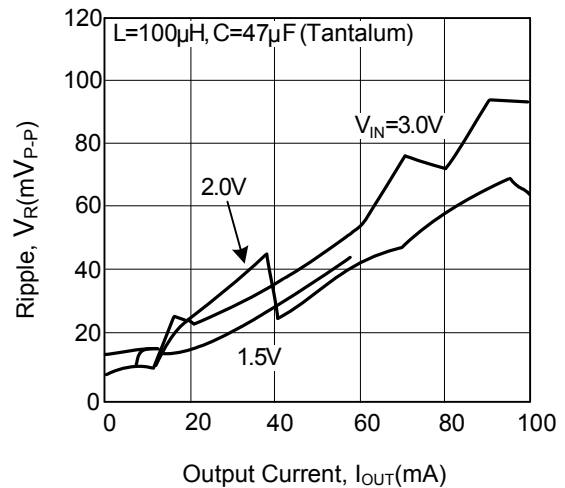
L3383-5.0V



(3) RIPPLE VOLTAGE vs. OUTPUT CURRENT  
L3383-3.0V

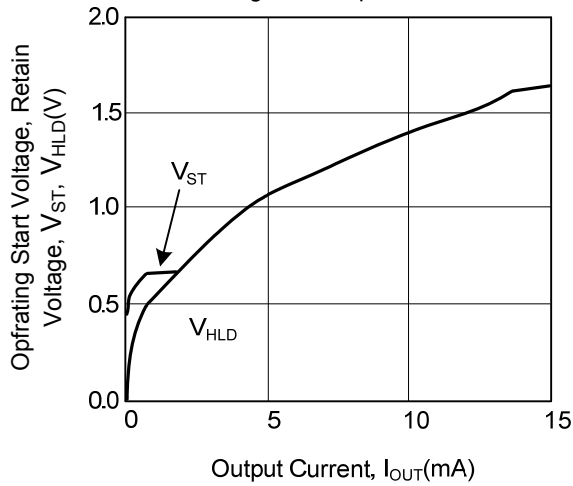


L3383-5.0V

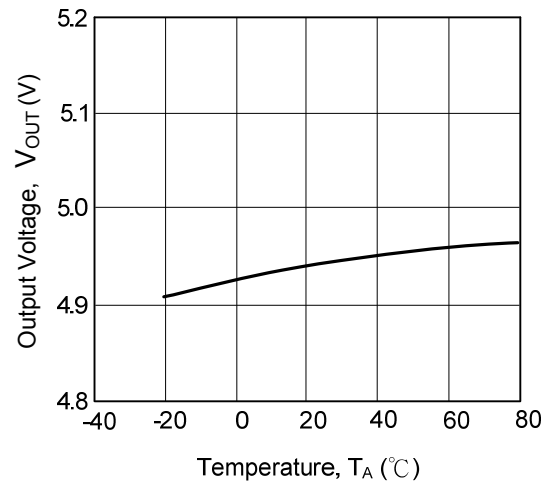


■ TYPICAL CHARACTERISTICS FOR UC3383-5.0

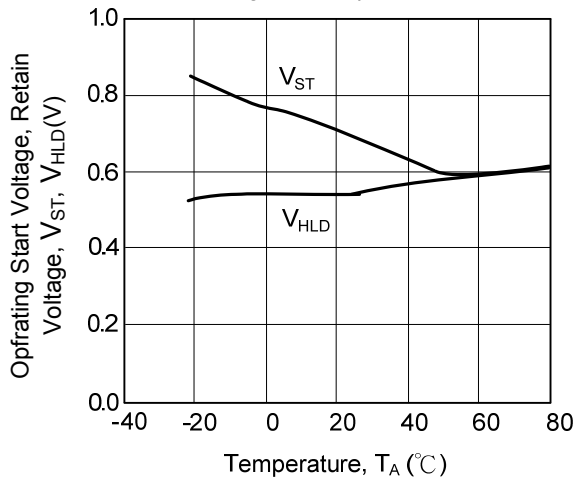
(1) Operating Start Voltage, Retain Voltage vs. Output Current



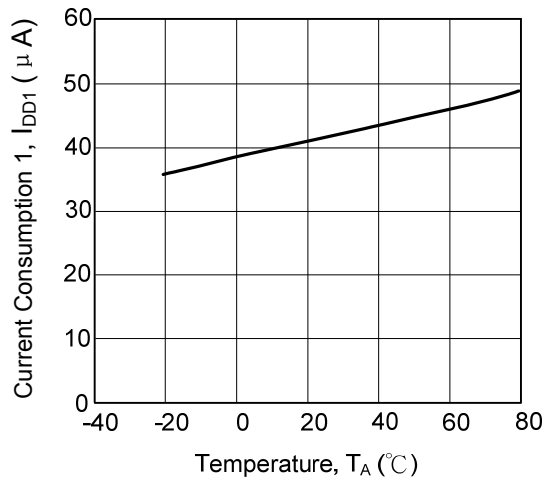
(2) Output Voltage vs. Temperature



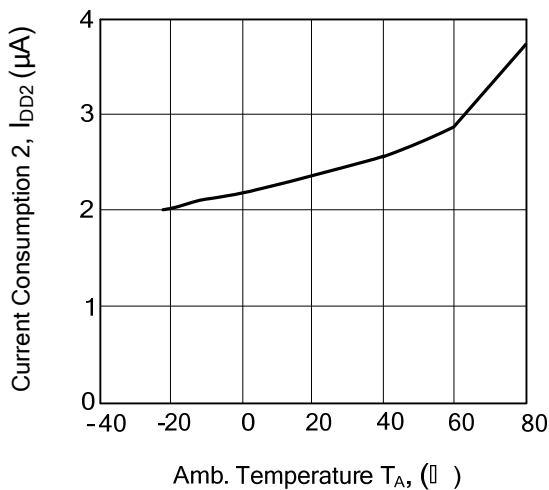
(3) Operating Start Voltage, Retain Voltage vs. Output Current



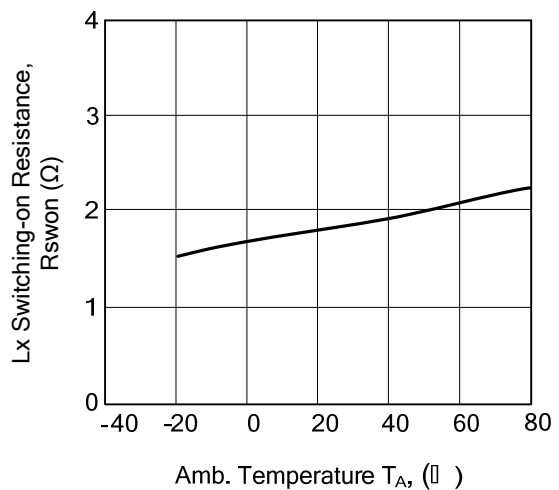
(4) Current Consumption 1 vs. Temperature



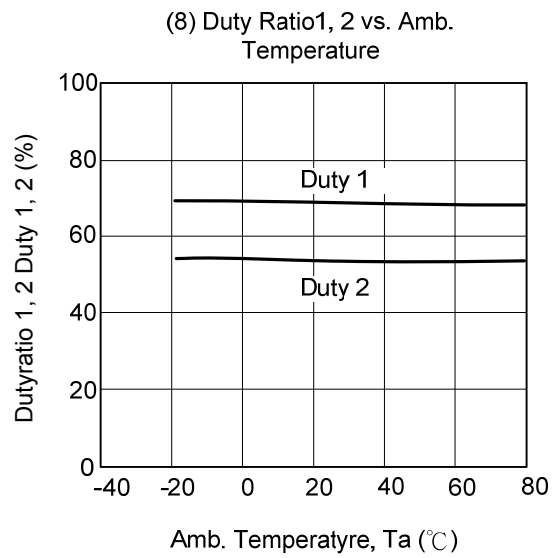
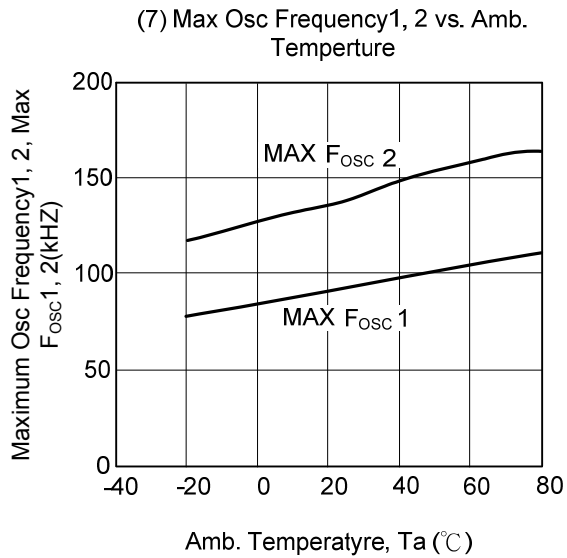
(5) Current Consumption 2 vs. Temperature



(6) Lx Switching-on Resistance vs. Temperature



■ TYPICAL CHARACTERISTICS FOR UC3383-5.0V (cont.)



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