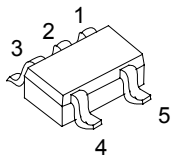
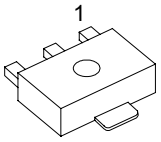
L3383

CMOS IC

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



SOT-25



SOT-89

*Pb-free plating product number: L3383L

■ DESCRIPTION

The UTC **L3383** Series are PFM step-up DC/DC switching converter. The UTC **L3383** 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 ±2.5%
* Maximum oscillator frequency (Max Fosc1): 180kHz (±15%)
* Variable Duty Ratio: 45%/75% (±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

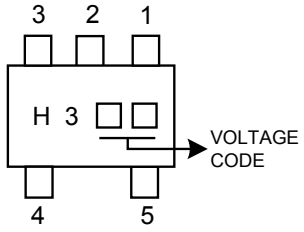
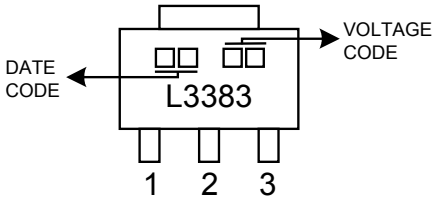
Order Number		Package	Pin Assignment					Packing
Normal	Lead Free Plating		1	2	3	4	5	
L3383-xx-AB3-R	L3383L-xx-AB3-R	SOT-89	G	O	I	-	-	Tape Reel
L3383-xx-AF5-R	L3383L-xx-AF5-R	SOT-25	E	O	N	G	I	Tape Reel

Note: Pin Assignment: I:V_{IN} O:V_{OUT} G:GND N: No Connection E: Chip Enable
xx: Output Voltage, refer to Marking Information.

L3383L-xx-AB3-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AB3: SOT-89, AF5: SOT-25
(3)Output Voltage Code	(3) xx: refer to Marking Information
(4)Lead Plating	(4) L: Lead Free Plating, Blank: Pb/Sn

■ MARKING INFORMATION

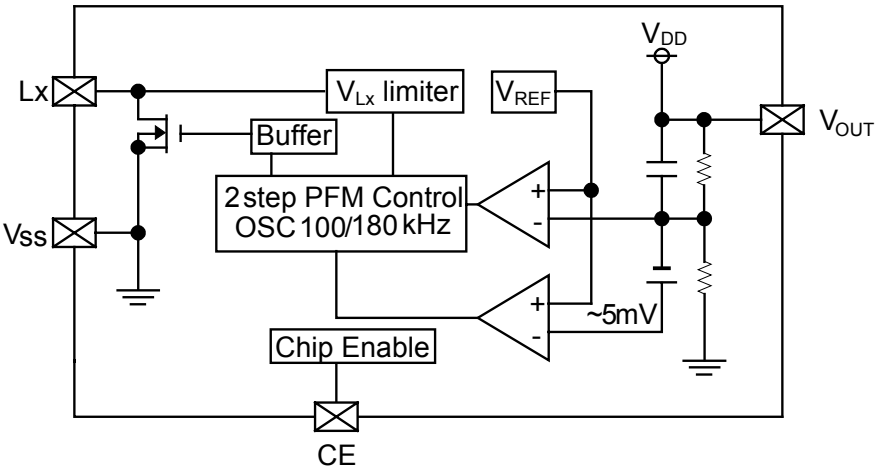
PACKAGE	VOLTAGE CODE	MARKING
SOT-25	20:2.0V 25:2.5V 26:2.6V 27:2.7V 28:2.8V 30:3.0V 31:3.1V	
SOT-89	32:3.2V 33:3.3V 36:3.6V 37:3.7V 40:4.0V 45:4.5V 50:5.0V	

■ PIN DESCRIPTION

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

■ BLOCK DIAGRAM

UTC L3383 (V_{DD} is internally connected to the V_{OUT} pin.)



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

■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER		SYMBOL	RATINGS	UNIT
V_{OUT} Input Voltage		V_{OUT}	12	V
Lx pin Voltage		V_{Lx}	12	V
CE Input Voltage		V_{CE}	12	V
V_{DD} Input Voltage		V_{DD}	12	V
Lx pin Current		I_{LX}	400	mA
Power Dissipation	SOT-89	P_D	500	mW
	SOT-25		250	mW
Operating Junction Temperature		T_J	+125	℃
Operating Ambient Temperature		T_{OPR}	-30 ~ +80	℃
Storage Temperature		T_{STG}	-40 ~ +125	℃

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 CHARACTRISTICS(Ta=25℃, V_{IN}=V_{OUT}× 0.6, unless otherwise specified.)

UTC L3383-2.0V (I_{OUT}=10mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	1.950	2.000	2.050	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD1}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.3	8.6	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		13.6	27.3	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		1.9	3.9	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		9.1	13.7	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		70		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-2.5V (I_{OUT}=10mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	2.438	2.500	2.563	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD1}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.45	8.95	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		16.65	33.35	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.0	4.05	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		7.15	10.8	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		70		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

UTC L3383-2.6V (I_{OUT}=10mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	2.535	2.600	2.665	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD1}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.48	9.02	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		17.26	34.56	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.02	4.08	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		6.76	10.22	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}.Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		70		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-2.7V (I_{OUT}=10mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	2.633	2.700	2.768	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD1}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.51	9.09	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		17.87	35.77	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.04	4.11	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		6.37	9.64	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}.Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		70		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

UTC L3383-2.8V (I_{OUT}=10mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	2.730	2.800	2.870	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD1}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.54	9.16	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		18.48	36.98	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.06	4.14	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		5.98	9.06	Ω
Duty Ratio 1		DTY1	Same as $I_{DD1,}$.Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		70		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-3.0V (I_{OUT}=30mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	2.925	3.000	3.075	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.6	9.3	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		19.7	39.4	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.1	4.2	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		5.2	7.9	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		80		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

UTC L3383-3.1V (I_{OUT}=30mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	3.023	3.100	3.178	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.635	9.365	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		20.3	40.6	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.115	4.23	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		5.08	7.72	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}, Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		80		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-3.2V (I_{OUT}=30mA)

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

UTC L3383-3.3V (I_{OUT}=30mA)

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

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-3.6V (I_{OUT}=30mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	3.510	3.600	3.690	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.81	9.62	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		23.3	46.6	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.19	4.38	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		4.48	6.82	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		80		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

UTC L3383-3.7V (I_{OUT}=30mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	3.608	3.700	3.793	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.845	9.755	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		23.9	47.8	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.205	4.41	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		4.36	6.64	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		80		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-4.0V (I_{OUT}=30mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	3.900	4.000	4.100	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		4.95	9.94	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		25.7	51.4	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.25	4.5	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		4.0	6.1	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		80		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

UTC L3383-4.5V (I_{OUT}=30mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	4.388	4.500	4.613	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		5.125	10.25	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		28.8	57.6	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.325	4.65	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		3.4	5.2	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		80		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

■ ELECTRICAL CHARACTRISTICS(Cont.)

UTC L3383-5.0V (I_{OUT}=50mA)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	L, SD, C_L etc. connected	4.875	5.000	5.125	V
Maximum Input Voltage		V_{IN}				10	V
Oscillation Start-up Voltage		V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage		V_{HLD}	I_{OUT}=1mA	0.70			V
Lx Limit Voltage		V_{LxLMT}	Same as I_{DD1}. Fosc>Fosc1×2	0.7		1.1	V
No-Load Input Current		I_{IN}	I_{OUT}=0mA (Note 1)		5.3	10.6	μA
Supply Current 1(Note 2)		I_{DD1}	V_{IN}=V_{OUT}×0.95		31.7	63.4	μA
Supply Current 2		I_{DD2}	V_{IN}=V_{OUT}+0.5V		2.4	4.8	μA
Lx Leakage Current		I_{LXL}	No external components, V_{OUT}=V_{Lx}=10V.			1.0	μA
Lx Switch-On Resistance		R_{SWON}	Same as I_{DD1}. V_{Lx}=0.4V		2.8	4.3	Ω
Duty Ratio 1		DTY1	Same as I_{DD1}. Measuring of Lx waveform	70	75	80	%
Duty Ratio 2		DTY2	I_{OUT}=1mA. Measuring of Lx on-time	40	45	50	%
Efficiency		EFFI	L, SD, C_L etc. connected		85		%
Maximum Oscillation Frequency		Fosc1	Same as I_{DD1}. 75% duty	150	180	210	kHz
		Fosc2	Same as I_{DD1}. 45% duty	100	120	130	kHz
For 5-Pins package Only							
CE Voltage	High	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
	Low	V_{CEL}	Same as I_{DD1}. Disappearance of Lx Oscillation			0.20	V
CE "High" Current	High	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT}×0.95			0.25	μA
	Low	I_{CEL}	Same as I_{DD1}. V_{CE}=0V			-0.25	μA
Stand-by Current		I_{STB}	Same as I_{DD1}.			0.5	μA

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

■ TYPICAL APPLICATION CIRCUITS

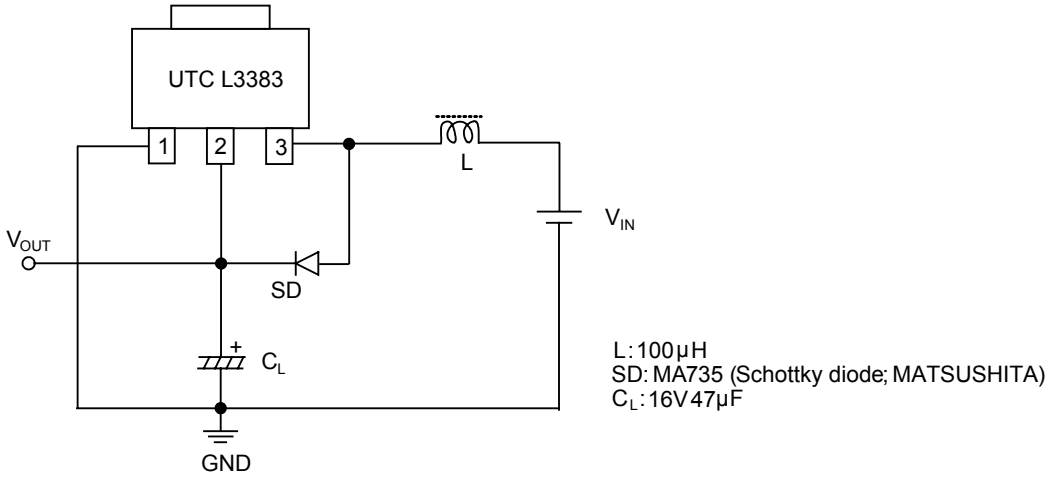


Fig.1 3-Lead Package Application(SOT-89)

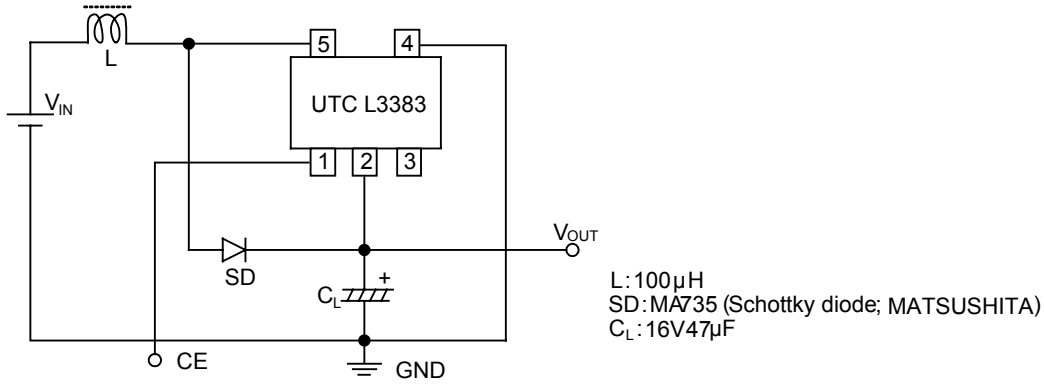
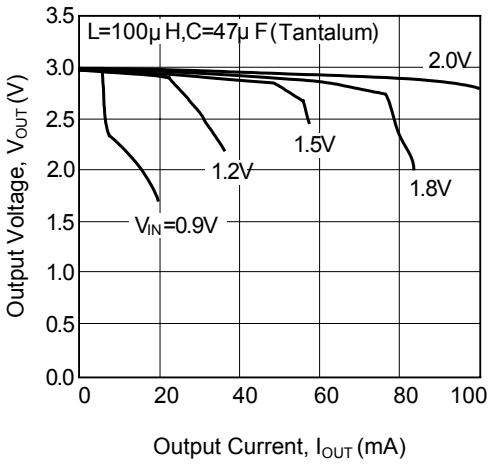


Fig.2 5-Lead Package Application(SOT-25)

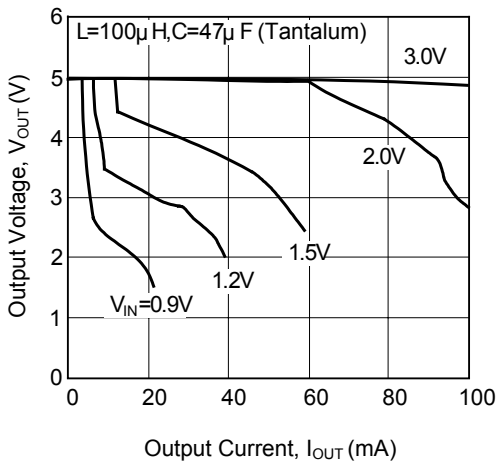
■ TYPICAL CHARACTERISTICS (BUILT-IN SWITCHING TRANSISTOR)

(1) OUTPUT VOLTAGE vs. OUTPUT CURREN

L3383-3.0V

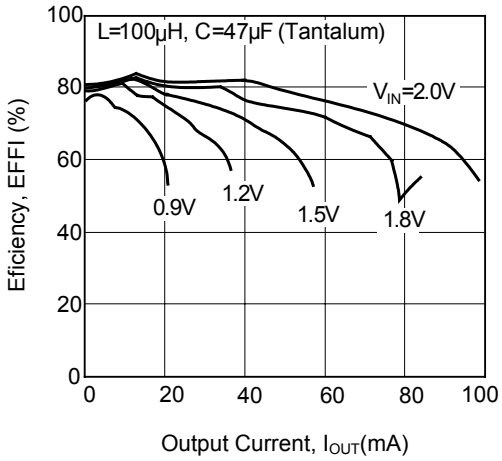


L3383-5.0V

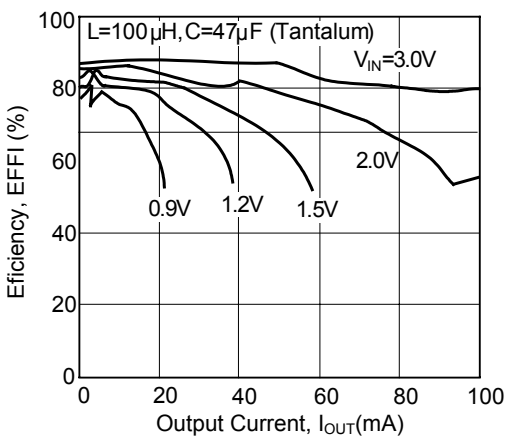


(2) EFFICIENCY vs. OUTPUT CURRENT

L3383-3.0V

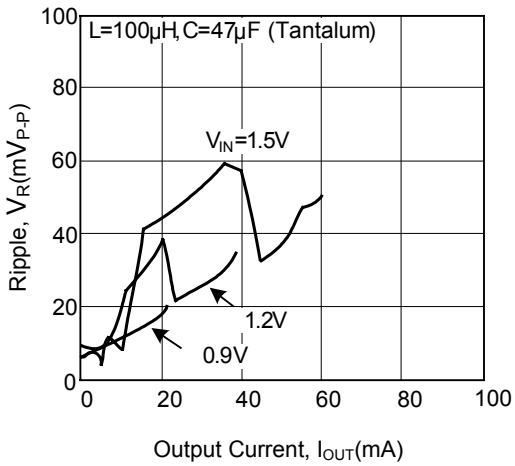


L3383-5.0V

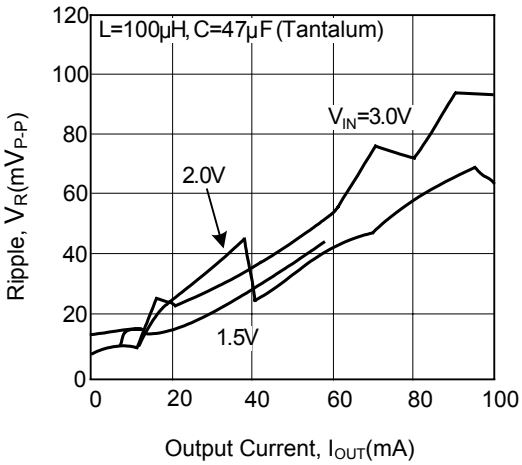


(3) RIPPLE VOLTAGE vs. OUTPUT CURRENT

L3383-3.0V

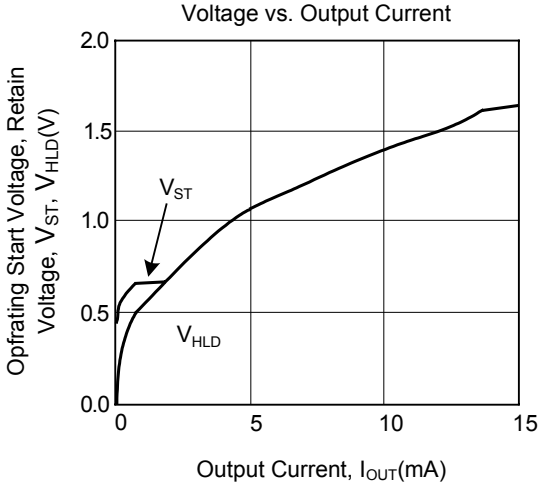


L3383-5.0V

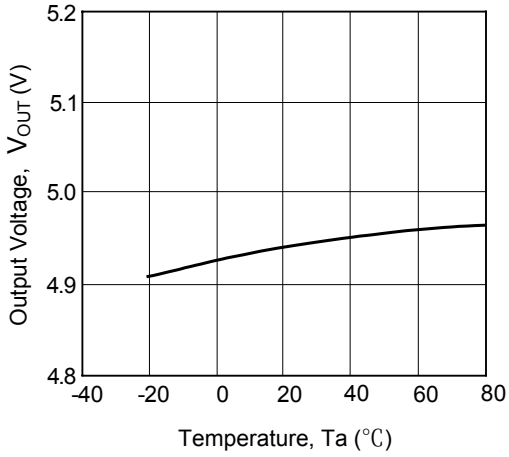


■ TYPICAL CHARACTERISTICS FOR L3383-5.0

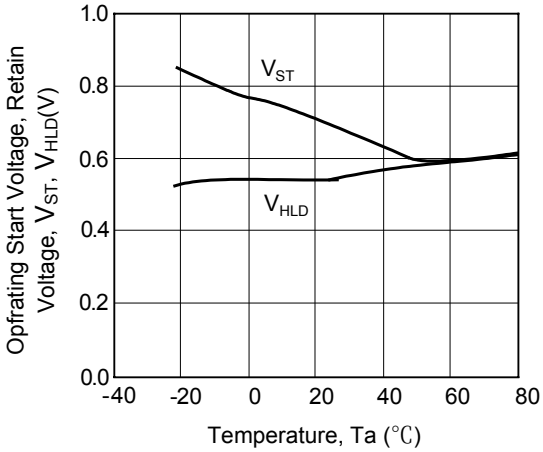
(1) Operating Start Voltage, Retain Voltage vs. Output Current



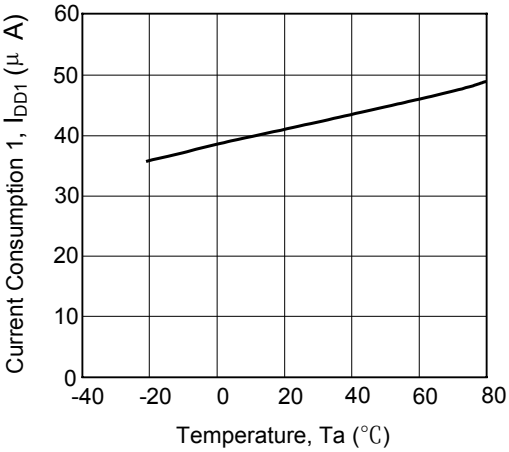
(2) Output Voltage vs. Temperature



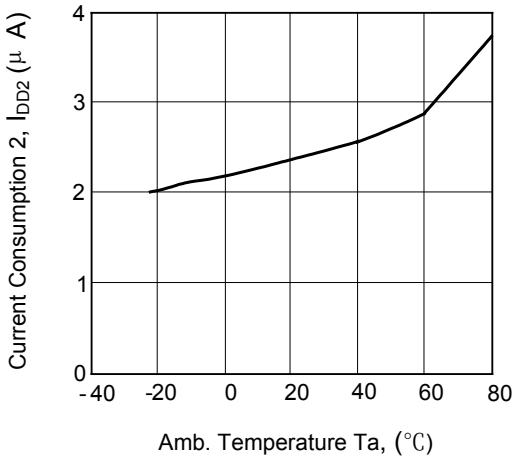
(3) Operating Start Voltage, Retain Voltage vs. Output Current



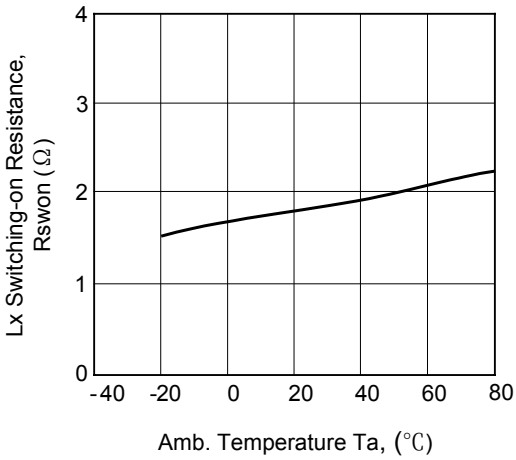
(4) Current Consumption 1 vs. Temperature



(5) Current Consumption 2 vs. Temperature

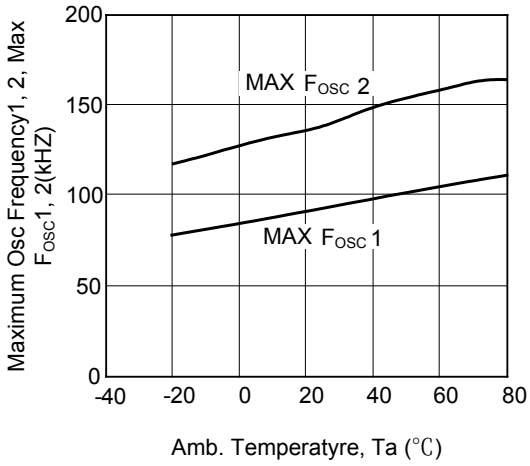


(6) Lx Switching-on Resistance vs. Temperature



■ TYPICAL CHARACTERISTICS FOR L3383-5.0V(cont.)

(7) Max Osc Frequency1, 2 vs. Amb. Temperture



(8) Duty Ratio1, 2 vs. Amb. Temperature