XC6382 Series

PFM Controlled, Step - Up DC/DC Converters (Duty Ratio 75%)

◆**Duty 75%**
◆**CMOS Low Power Consumption**
◆**Operating Voltage : 0.9V~10.0V**
◆**Output Voltage Range : 2.0V~7.0V**
◆**Output Voltage Accuracy : ±2.5%**

■Applications

●Cellular phones, pagers
●Palmtops
●Cameras, video recorders
●Portable equipment

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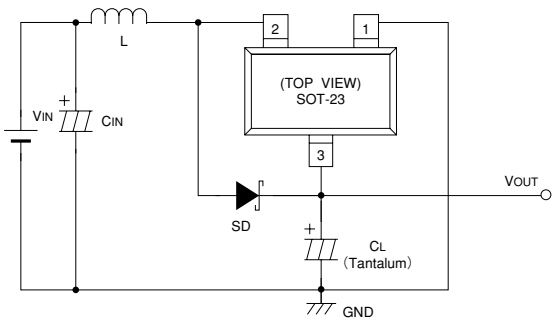
■General Description

The XC6382 series is a group of PFM controlled step-up DC/DC converters.
The XC6382 series employs CMOS process and laser trimming technologies so as to attain low power and high accuracy.
Max. oscillator frequency is trimmed to 100kHz (accuracy: ±15%)
Every built-in switching transistor type enables a step-up circuit to be configured using only three external components ; a coil, a diode, and a capacitor.
External transistor versions are available to accommodate high output current applications.
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 (separating power and voltage detect pins).
SOT-23, SOT-25 and SOT-89-5 super mini-mold packages.

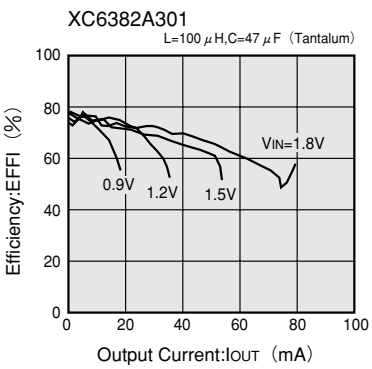
■Features

Operating (start-up) voltage range : 0.9V~10V
Output voltage range : 2.0V~7.0V in 0.1V increments
Highly accurate : Set-up voltage ±2.5%
Maximum oscillator frequency : 100kHz (±15%)
Duty ratio : 75%(±5%)
Both switching transistor built-in and external types are available.
Five-lead packaged units offer either Chip Enable or independent V_{OUT} pin option.
Small package : SOT-23, 25 mini-mold (3-pin, 5-pin)
SOT-89, 89-5 mini-power mold (3-pin, 5-pin)

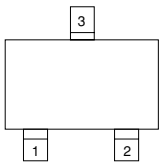
■Typical Application Circuit



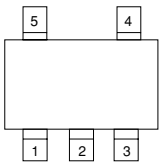
■Typical Performance Characteristic



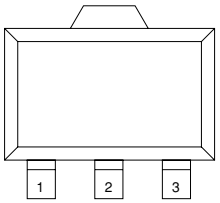
■Pin Configuration



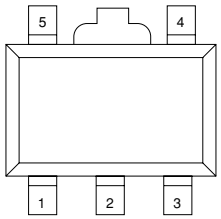
SOT-23
(TOP VIEW)



SOT-25
(TOP VIEW)



SOT-89
(TOP VIEW)



SOT-89-5
(TOP VIEW)

■Pin Assignment

(XC6382A, XC6382B)

PIN NUMBER				PIN NAME	FUNCTION
XC6382A		XC6382B			
SOT-23	SOT-89	SOT-23	SOT-89		
1	1	1	1	V_{SS}	Ground
3	2	3	2	V_{OUT}	Output voltage monitor, IC internal power supply
2	3	–	–	Lx	Switch
–	–	2	3	EXT	External switch transistor drive

(XC6382C, XC6382D)

PIN NUMBER				PIN NAME	FUNCTION
XC6382C		XC6382D			
SOT-25	SOT-89-5	SOT-25	SOT-89-5		
4	5	4	5	V_{SS}	Ground
2	2	2	2	V_{DD}	Output voltage monitor, IC internal power supply
5	4	–	–	Lx	Switch
–	–	5	4	EXT	External switch transistor drive
1	3	1	3	CE	Chip enable
3	1	3	1	NC	No connection

(XC6382E, XC6382F)

PIN NUMBER				PIN NAME	FUNCTION
XC6382E		XC6382F			
SOT-25	SOT-89-5	SOT-25	SOT-89-5		
4	5	4	5	V_{SS}	Ground
2	2	2	2	V_{DD}	IC internal power supply
5	4	–	–	Lx	Switch
–	–	5	4	EXT	External switch transistor drive
1	3	1	3	V_{OUT}	Output voltage monitor
3	1	3	1	NC	No connection

■Product Classification

●Selection Guide

PART TYPE	DUTY RATIO	PACKAGE	SWITCHING RELATED	ADDITIONAL FUNCTION	FEATURES
XC6382A	75%	SOT-23, SOT-89	Built-in Transistor "Lx" lead	———	• Accommodates a duty ratio of 75%.
XC6382B	75%	SOT-23, SOT-89	External Transistor "EXT" lead	———	• Accommodates a duty ratio of 75%. • Adding an external transistor can improve the output capability by up to several hundred mA.
XC6382C	75%	SOT-25, SOT-89-5	Built-in Transistor "Lx" lead	Chip Enable(CE)	• Stand-by (CE) function added version to the XC6382A. • Stand-by current: 0.5μA max.
XC6382D	75%	SOT-25, SOT-89-5	External Transistor "EXT" lead	Chip Enable(CE)	• Stand-by (CE) function added version to the XC6382B. • Stand-by current: 0.5μA max.
XC6382E	75%	SOT-25, SOT-89-5	Built-in Transistor "Lx" lead	Separated "V_{DD}" and "V_{OUT}" leads	• Independent power supply and set-up voltage sensing leads allow designing of PFM controllers.
XC6382F	75%	SOT-25, SOT-89-5	External Transistor "EXT" lead	Separated "V_{DD}" and "V_{OUT}" leads	• Independent power supply and set-up voltage sensing leads allow designing of PFM controllers.

●Ordering Information

XC6382①②③④⑤⑥

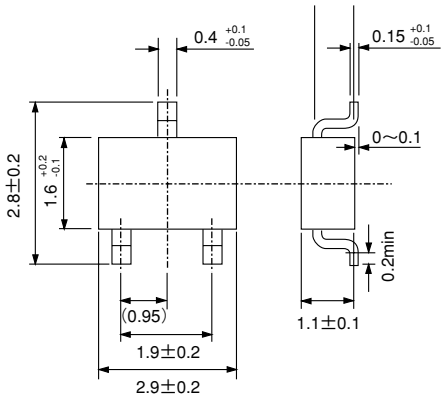
XC6382 Series PFM Controlled Duty 75%

①	A	3-pin. Built-in switching transistor		
	B	3-pin. External switching transistor		
	C	Stand-by capability. (5-pin) Built-in switching transistor		
	D	Stand-by capability. (5-pin) External switching transistor		
	E	Separated V_{DD} and V_{OUT}. (5-pin) Built-in switching transistor		
	F	Separated V_{DD} and V_{OUT}. (5-pin) External switching transistor		
② ③	Output Voltage e.g.V_{OUT}=3.5V ➔ ②=3, ③=5			
④	1	Maximum Oscillator Frequency 100kHz		
⑤	M	Package	①=A~B ①=C~F	SOT-23 SOT-25
	P	Package	①=A~B ①=C~F	SOT-89 SOT-89-5
⑥	R	Embossed tape : Standard Feed		
	L	Embossed tape : Reverse Feed		

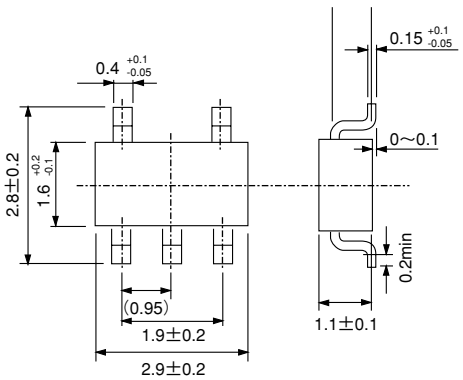
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■Packaging Information

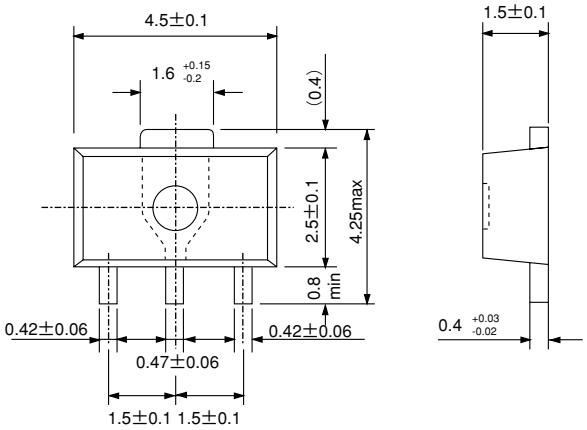
●SOT-23



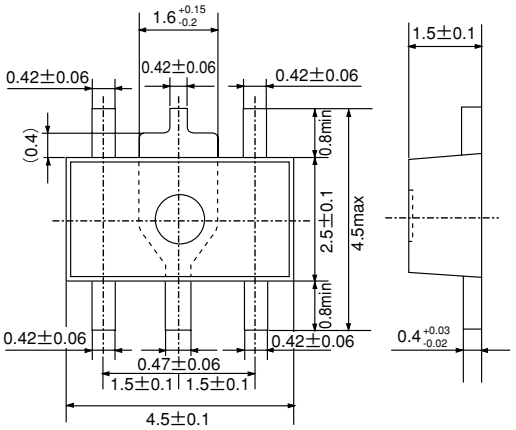
●SOT-25



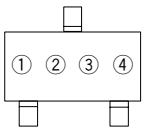
●SOT-89



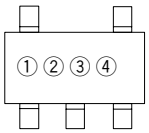
●SOT-89-5



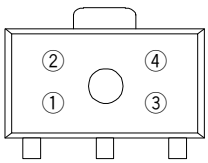
■Marking



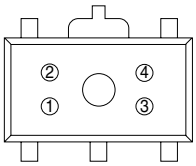
SOT-23
(TOP VIEW)



SOT-25
(TOP VIEW)



SOT-89
(TOP VIEW)



SOT-89-5
(TOP VIEW)

① Represents the Product Classification

DESIGNATOR	FUNCTION		PRODUCT NAME
$\overline{E}$	—	Built-in Transistor	XC6382A＊＊＊＊＊
$\overline{F}$	—	External Transistor	XC6382B＊＊＊＊＊
$\overline{L}$	CE	Built-in Transistor	XC6382C＊＊＊＊＊
$\overline{M}$	CE	External Transistor	XC6382D＊＊＊＊＊
$\overline{N}$	VDD/VIN	Built-in Transistor	XC6382E＊＊＊＊＊
$\overline{P}$	VDD/VIN	External Transistor	XC6382F＊＊＊＊＊

② Represents the integer of the Output Voltage and Oscillator Frequency

INTEGER OF THE OUTPUT VOLTAGE	OSCILLATOR FREQUENCY（kHz）
	100
1	1
2	2
3	3
4	4
5	5
6	6
7	7

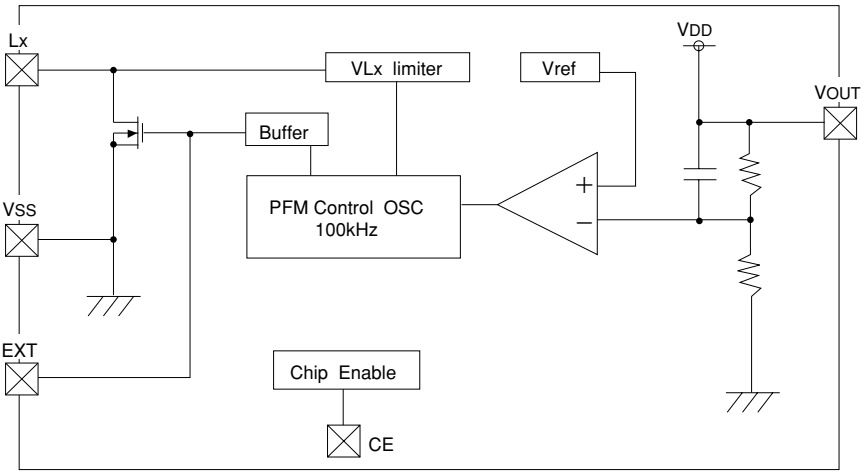
③ Represents the decimal number of the Output Voltage and Oscillator Frequency

OUTPUT VOLTAGE	OSCILLATOR FREQUENCY（kHz）
	100
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

④ Denotes the production lot number
0 to 9, A to Z repeated(G.I.J.O.Q.W excepted)

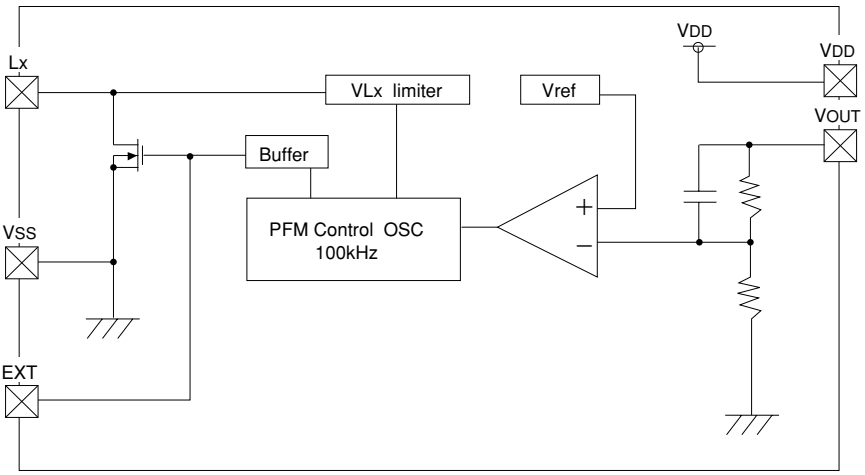
■Block Diagram

●XC6382A~XC6382D (VOUT pin serves as VDD also.)



Note: Built-in Tr types use the Lx pin, external Tr types use the EXT pin.
The CE pin is only used with the XC6382C and XC6382D.

●XC6382E and XC6382F



Note: The VDD pin is only used with the XC6382E and XC6382F.
Built-in Tr types use the Lx pin , external Tr types use the EXT pin.

■Absolute Maximum Ratings

Ta=25°C

PARAMETER		SYMBOL	RATINGS	UNITS
V_{OUT} Input Voltage		V_{OUT}	12	V
Lx pin Voltage		V_{LX}	12	V
Lx pin Current		I_{LX}	400	mA
EXT pin Voltage		V_{EXT}	V_{SS}–0.3~V_{OUT}+0.3	V
EXT pin Current		I_{EXT}	±50	mA
CE Input Voltage		V_{CE}	12	V
V_{DD} Input Voltage		V_{DD}	12	V
Continuous Total Power Dissipation	SOT-23	Pd	150	mW
	SOT-89		500	
Operating Ambient Temperature		Topr	–30~+80	°C
Storage Temperature		Tstg	–40~+125	°C

■Electrical Characteristics

XC6382A301MR V_{OUT}=3.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
No-Load Input Current	I_{IN}	I_{OUT}=0mA(Note1)		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 Switch-On Resistance	R_{SWON}	Same as I_{DD1}. V_{LX}=0.4V.		5.2	7.9	Ω
Lx Leakage Current	I_{LXL}	No external components. V_{OUT}=V_{LX}=10V.			1.0	μA
Duty Ratio	DTY	Same as I_{DD1}. Measuring of Lx waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXF_{OSC}	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Stand-by Current	I_{STB}	Same as I_{DD1}.				
Lx Limit Voltage	VLxLMT	Same as I_{DD1}, F_{OSC} > MAXF_{OSC} × 2	0.7		1.1	V
Efficiency	EFFI	L,SD,C_L etc. connected		80		%

Measuring conditions: Unless otherwise specified, V_{IN}=V_{OUT} × 0.6, I_{OUT}=30mA. See Typical Application Circuits, Fig.1.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V.
2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

XC6382A501MR V_{OUT}=5.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
No-Load Input Current	I_{IN}	I_{OUT}=0mA(Note1)		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 Switch-On Resistance	R_{SWON}	Same as I_{DD1}. V_{LX}=0.4V.		2.8	4.3	Ω
Lx Leakage Current	I_{LXL}	No external components. V_{OUT}=V_{LX}=10V.			1.0	μA
Duty Ratio	DTY	Same as I_{DD1}. Measuring of Lx waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXF_{OSC}	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Stand-by Current	I_{STB}	Same as I_{DD1}.				
Lx Limit Voltage	VLxLMT	Same as I_{DD1}, F_{OSC} > MAXF_{OSC} × 2	0.7		1.1	V
Efficiency	EFFI	L,SD,C_L etc. connected		85		%

Measuring conditions: Unless otherwise specified, V_{IN}=V_{OUT} × 0.6, I_{OUT}=50mA. See Typical Application Circuits, Fig.1.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V.
2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

XC6382B301MR V_{OUT}=3.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
Supply Current 1 (Note 1)	$I_{DD}1$	V_{IN}=V_{OUT} × 0.95		19.7	39.4	μA
Supply Current 2	$I_{DD}2$	V_{IN}=V_{OUT}+0.5		2.1	4.2	μA
EXT "High" On Resistance	R_{EXTH}	Same as $I_{DD}1$. V_{EXT}=V_{OUT}–0.4V.		76	114	Ω
EXT "Low" On Resistance	R_{EXTL}	Same as $I_{DD}1$. V_{EXT}=0.4V.		76	114	Ω
Duty Ratio	DTY	Same as $I_{DD}1$. Measuring of EXT waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFOSC	Same as $I_{DD}1$. 75% duty.	85	100	115	kHz
Efficiency	EFFI	L,SD,C_L,Tr., etc. connected		80		%

Measuring conditions: Unless otherwise specified, V_{IN}=V_{OUT} × 0.6, I_{OUT}=30mA. See Typical Application circuits, Fig.2.

Note: 1. "Supply Current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption.

XC6382B501MR V_{OUT}=5.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
Supply Current 1 (Note 1)	$I_{DD}1$	V_{IN}=V_{OUT} × 0.95		31.7	63.4	μA
Supply Current 2	$I_{DD}2$	V_{IN}=V_{OUT}+0.5		2.4	4.8	μA
EXT "High" On Resistance	R_{EXTH}	Same as $I_{DD}1$. V_{EXT}=V_{OUT}–0.4V.		50	75	Ω
EXT "Low" On Resistance	R_{EXTL}	Same as $I_{DD}1$. V_{EXT}=0.4V.		50	75	Ω
Duty Ratio	DTY	Same as $I_{DD}1$. Measuring of EXT waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFOSC	Same as $I_{DD}1$. 75% duty.	85	100	115	kHz
Efficiency	EFFI	L,SD,C_L,Tr., etc. connected		85		%

Measuring conditions: Unless otherwise specified, V_{IN}=V_{OUT} × 0.6, I_{OUT}=50mA. See Typical Application circuits, Fig.2.

Note: 1. "Supply Current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption.

XC6382C301MR V_{OUT}=3.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
No-Load Input Current	I_{IN}	I_{OUT}=0mA (Note1)		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 Switch-On Resistance	R_{SWON}	Same as I_{DD1}. V_{LX}=0.4V		5.2	7.9	Ω
Lx Leakage Current	I_{LXL}	No external components. V_{OUT}=V_{LX}=10V.			1.0	μA
Duty Ratio	DTY	Same as I_{DD1}. Measuring of Lx waveform.	70	75	80	%
Maximum Oscillation Frequency	$MAXF_{OSC}$	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Stand-by Current	I_{STB}	Same as I_{DD1}.			0.5	μA
CE "High" Voltage	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
CE "Low" Voltage	V_{CEL}	Same as I_{DD1}. Disapperance of Lx Oscillation.			0.20	V
CE "High" Current	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT} × 0.95.			0.25	μA
CE "Low" Current	I_{CEL}	Same as I_{DD1}. V_{CE}=0V.			–0.25	μA
Lx Limit Voltage	VLxLMT	Same as I_{DD1}.	0.7		1.1	V
Efficiency	EFFI	L,SD,C_L etc. connected		80		%

Measuring conditions: Unless otherwise specified, connect CE to V_{OUT}, V_{IN}=V_{OUT} × 0.6, I_{OUT}=30mA. See Typical Application Circuits, Fig.3.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V

2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

XC6382C501MR V_{OUT}=5.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
No-Load Input Current	I_{IN}	I_{OUT}=0mA (Note1)		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 Switch-On Resistance	R_{SWON}	Same as I_{DD1}. V_{LX}=0.4V		2.8	4.3	Ω
Lx Leakage Current	I_{LXL}	No external components. V_{OUT}=V_{LX}=10V.			1.0	μA
Duty Ratio	DTY	Same as I_{DD1}. Measuring of Lx waveform.	70	75	80	%
Maximum Oscillation Frequency	$MAXF_{OSC}$	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Stand-by Current	I_{STB}	Same as I_{DD1}.			0.5	μA
CE "High" Voltage	V_{CEH}	Same as I_{DD1}. Existence of Lx Oscillation.	0.75			V
CE "Low" Voltage	V_{CEL}	Same as I_{DD1}. Disapperance of Lx Oscillation.			0.20	V
CE "High" Current	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT} × 0.95.			0.25	μA
CE "Low" Current	I_{CEL}	Same as I_{DD1}. V_{CE}=0V.			–0.25	μA
Lx Limit Voltage	VLxLMT	Same as I_{DD1}.	0.7		1.1	V
Efficiency	EFFI	L,SD,C_L etc. connected		85		%

Measuring conditions: Unless otherwise specified, connect CE to V_{OUT}, V_{IN}=V_{OUT} × 0.6, I_{OUT}=50mA. See Typical Application Circuits, Fig.3.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V

2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

XC6382D301MR V_{OUT}=3.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	L,SD,C_L,Tr., 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
Supply Current 1 (Note1)	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
EXT "High" On Resistance	R_{EXTH}	Same as I_{DD1}. V_{EXT}=V_{OUT}–0.4V.		76	114	Ω
EXT "Low" On Resistance	R_{EXTL}	Same as I_{DD1}. V_{EXT}=0.4V.		76	114	Ω
Duty Ratio	DTY	Same as I_{DD1}. Measuring of EXT waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFosc	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Stand-by Current	I_{STB}	Same as I_{DD1}.			0.5	μA
CE "High" Voltage	V_{CEH}	Same as I_{DD1}. Existence of EXT Oscillation.	0.75			V
CE "Low" Voltage	V_{CEL}	Same as I_{DD1}. Disappearance of EXT Oscillation.			0.20	V
CE "High" Current	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT} × 0.95.			0.25	μA
CE "Low" Current	I_{CEL}	Same as I_{DD1}. V_{CE}=0V.			–0.25	μA
Efficiency	EFFI	L,SD,C_L,Tr., etc. connected		80		%

Measuring conditions: Unless otherwise specified, connect CE to V_{OUT}, V_{IN}=V_{OUT} × 0.6, I_{OUT}=30mA. See Typical Application Circuits, Fig.4.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V.
2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

XC6382D501MR V_{OUT}=5.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	L,SD,C_L,Tr., 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
Supply Current 1 (Note1)	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
EXT "High" On Resistance	R_{EXTH}	Same as I_{DD1}. V_{EXT}=V_{OUT}–0.4V.		50	75	Ω
EXT "Low" On Resistance	R_{EXTL}	Same as I_{DD1}. V_{EXT}=0.4V.		50	75	Ω
Duty Ratio	DTY	Same as I_{DD1}. Measuring of EXT waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFosc	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Stand-by Current	I_{STB}	Same as I_{DD1}.			0.5	μA
CE "High" Voltage	V_{CEH}	Same as I_{DD1}. Existence of EXT Oscillation.	0.75			V
CE "Low" Voltage	V_{CEL}	Same as I_{DD1}. Disappearance of EXT Oscillation.			0.20	V
CE "High" Current	I_{CEH}	Same as I_{DD1}. V_{CE}=V_{OUT} × 0.95.			0.25	μA
CE "Low" Current	I_{CEL}	Same as I_{DD1}. V_{CE}=0V.			–0.25	μA
Efficiency	EFFI	L,SD,C_L,Tr., etc. connected		85		%

Measuring conditions: Unless otherwise specified, connect CE to V_{OUT}, V_{IN}=V_{OUT} × 0.6, I_{OUT}=50mA. See Typical Application Circuits, Fig.4.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V.
2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

XC6382E301MR V_{OUT}=3.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
No-Load Input Current	I_{IN}	I_{OUT}=0mA (Note1)		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 Switch-On Resistance	RSWON	Same as I_{DD1}. V_{LX}=0.4V.		5.2	7.9	Ω
Lx Leakage Current	I_{LXL}	No external components. V_{OUT}=V_{LX}=10V.			1.0	μA
Duty Ratio	DTY	Same as I_{DD1}. Measuring of Lx waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFOSC	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Lx Limit Voltage	VLxLMT	Same as I_{DD1}. F_{OSC} > MAXF_{OSC} × 2	0.7		1.1	V
Efficiency	EFFI	L, SD, C_L etc. connected		80		%

Measuring conditions: Unless otherwise specified, connect V_{DD} to V_{OUT}, V_{IN}=V_{OUT} × 0.6, I_{OUT}=30mA. See Typical Application Circuits, Fig.5.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V

2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

* When the V_{DD} and V_{OUT} pins are independently used, the voitage range at the V_{DD} pin should be 2.2V to 10V.
The IC operates from V_{DD}=0.8V. However, output voltage and oscillator frequency are properly stabilized when V_{DD}=2.2V or higher.

XC6382E501MR V_{OUT}=5.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
No-Load Input Current	I_{IN}	I_{OUT}=0mA (Note1)		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 Switch-On Resistance	RSWON	Same as I_{DD1}. V_{LX}=0.4V.		2.8	4.3	Ω
Lx Leakage Current	I_{LXL}	No external components. V_{OUT}=V_{LX}=10V.			1.0	μA
Duty Ratio	DTY	Same as I_{DD1}. Measuring of Lx waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFOSC	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Lx Limit Voltage	VLxLMT	Same as I_{DD1}. F_{OSC} > MAXF_{OSC} × 2	0.7		1.1	V
Efficiency	EFFI	L, SD, C_L etc. connected		85		%

Measuring conditions: Unless otherwise specified, connect V_{DD} to V_{OUT}, V_{IN}=V_{OUT} × 0.6, I_{OUT}=50mA. See Typical Application Circuits, Fig.5.

Note: 1. The Schottky diode (SD) must be type MA735, with reverse current (I_R) <1.0μA at reverse voltage (V_R)=10.0V

2. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption. The current actually provided by an external V_{IN} source is represented by "No-Load Input Current (I_{IN})".

* When the V_{DD} and V_{OUT} pins are independently used, the voitage range at the V_{DD} pin should be 2.2V to 10V.
The IC operates from V_{DD}=0.8V. However, output voltage and oscillator frequency are properly stabilized when V_{DD}=2.2V or higher.

XC6382F301MR V_{OUT}=3.0V Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
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
Supply Current 1 (Note1)	I_{DD1}	$V_{IN}=V_{OUT} \times 0.95$		19.7	39.4	μA
Supply Current 2	I_{DD2}	$V_{IN}=V_{OUT}+0.5V$		2.1	4.2	μA
EXT "High" On Resistance	R_{EXTH}	Same as I_{DD1}. $V_{EXT}=V_{OUT}$-0.4V.		76	114	Ω
EXT "Low" On Resistance	R_{EXTL}	Same as I_{DD1}. V_{EXT}=0.4V.		76	114	Ω
Duty Ratio	DTY	Same as I_{DD1}. Measuring of EXT waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFosc	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Efficiency	EFFI	L, SD, C_L etc. connected		80		%

Measuring conditions: Unless otherwise specified, connect V_{DD} to V_{OUT}, $V_{IN}=V_{OUT} \times 0.6$, I_{OUT}=30mA. See Typical Application Circuits, Fig.6.

Note: 1. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption.

* When the V_{DD} and V_{OUT} pins are independently used, the voltage range at the V_{DD} pin should be 2.2V to 10V.
The IC operates from V_{DD}=0.8V. However, output voltage and oscillator frequency are properly stabilized when V_{DD}=2.2V or higher.

XC6382F501MR V_{OUT}=5.0V Ta=25°C

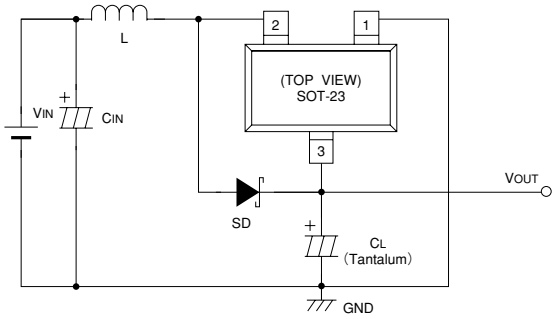
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	L, SD, C_L etc. connected	4.875	5.000	5.125	V
Maximum Input Voltage	V_{IN}		10			V
Oscillation Start-up Voltage	V_{ST}	I_{OUT}=1mA		0.80	0.90	V
Oscillation Hold Voltage	V_{HLD}	I_{OUT}=1mA	0.70			V
Supply Current 1 (Note1)	I_{DD1}	$V_{IN}=V_{OUT} \times 0.95$		31.7	63.4	μA
Supply Current 2	I_{DD2}	$V_{IN}=V_{OUT}+0.5V$		2.4	4.8	μA
EXT "High" On Resistance	R_{EXTH}	Same as I_{DD1}. $V_{EXT}=V_{OUT}$-0.4V.		50	75	Ω
EXT "Low" On Resistance	R_{EXTL}	Same as I_{DD1}. V_{EXT}=0.4V.		50	75	Ω
Duty Ratio	DTY	Same as I_{DD1}. Measuring of EXT waveform.	70	75	80	%
Maximum Oscillation Frequency	MAXFosc	Same as I_{DD1}. 75% duty.	85	100	115	kHz
Efficiency	EFFI	L, SD, C_L etc. connected		85		%

Measuring conditions: Unless otherwise specified, connect V_{DD} to V_{OUT}, $V_{IN}=V_{OUT} \times 0.6$, I_{OUT}=50mA. See Typical Application Circuits, Fig.6.

Note: 1. "Supply current 1" is the supply current while the oscillator is continuously oscillating. In actual operation the oscillator periodically operates which results in less average power consumption.

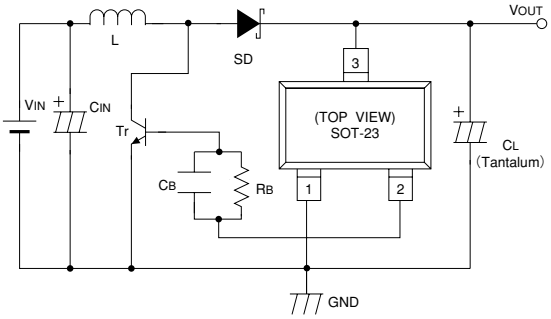
* When the V_{DD} and V_{OUT} pins are independently used, the voltage range at the V_{DD} pin should be 2.2V to 10V.
The IC operates from V_{DD}=0.8V. However, output voltage and oscillator frequency are properly stabilized when V_{DD}=2.2V or higher.

■Typical Application Circuits



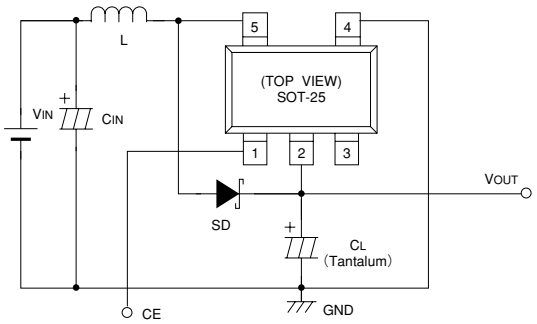
L : 100μH (SUMIDA, CR-54)
SD : MA2Q735 (Schottky diode; MATSUSHITA)
CL : 16V 47μF (Tantalum capacitor; NICHICON, MCE)
CIN : 16V 220μF (Aluminium Electrolytic Capacitor)

Fig.1 XC6382A Application



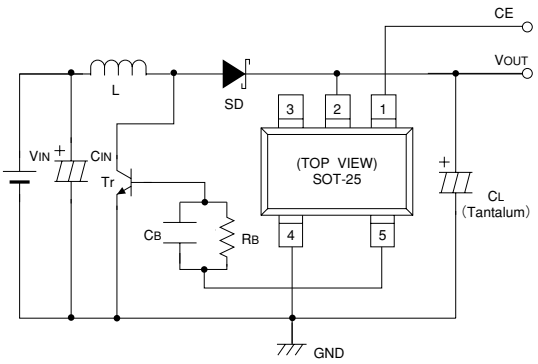
L : 47μH (SUMIDA, CR-54)
SD : MA2Q735 (Schottky diode; MATSUSHITA)
CL : 16V 47μF (Tantalum capacitor; NICHICON, MCE)
CIN : 16V 220μF (Aluminium Electrolytic Capacitor)
RB : 1kΩ, CB: 3300pF
Tr : 2SC3279, 2SD1628G

Fig.2 XC6382B Application



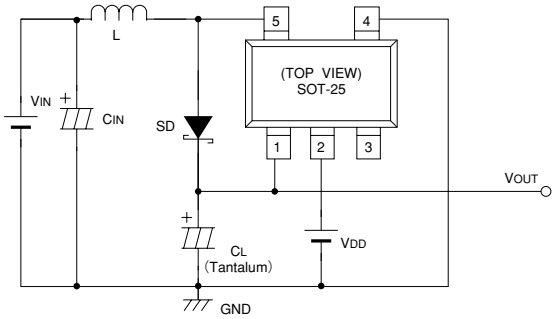
L : 100μH (SUMIDA, CR-54)
SD : MA2Q735 (Schottky diode; MATSUSHITA)
CL : 16V 47μF (Tantalum capacitor; NICHICON, MCE)
CIN : 16V 220μF (Aluminium Electrolytic Capacitor)

Fig.3 XC6382C Application



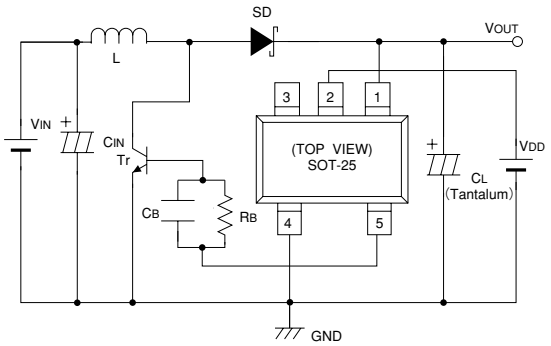
L : 47μH (SUMIDA, CR-54)
SD : MA2Q735 (Schottky diode; MATSUSHITA)
CL : 16V 47μF (Tantalum capacitor; NICHICON, MCE)
CIN : 16V 220μF (Aluminium Electrolytic Capacitor)
RB : 1kΩ, CB: 3300pF
Tr : 2SC3279, 2SD1628G

Fig.4 XC6382D Application



L : 100µH (SUMIDA, CR-54)
SD : MA2Q735 (Schottky diode; MATSUSHITA)
C_L : 16V 47µF (Tantalum capacitor; NICHICON, MCE)
C_{IN} : 16V 220µF (Aluminium Electrolytic Capacitor)

Fig.5 XC6382E Application

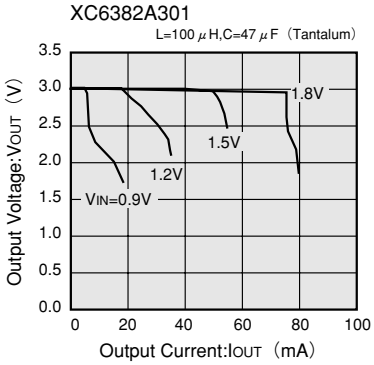


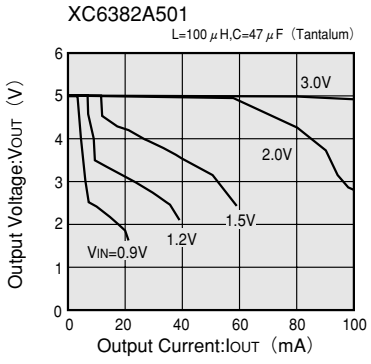
L : 47µH (SUMIDA, CR-54)
SD : MA2Q735 (Schottky diode; MATSUSHITA)
C_L : 16V 47µF (Tantalum capacitor; NICHICON, MCE)
C_{IN} : 16V 220µF (Aluminium Electrolytic Capacitor)
R_B : 1kΩ, C_B: 3300pF
Tr : 2SC3279, 2SD1628G

Fig.6 XC6382F Application

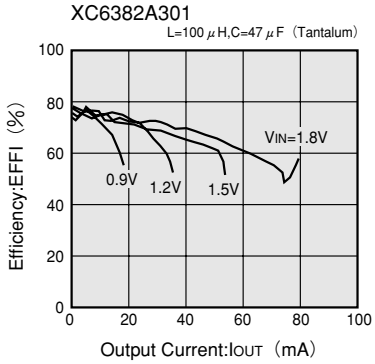
■Typical Performance Characteristics

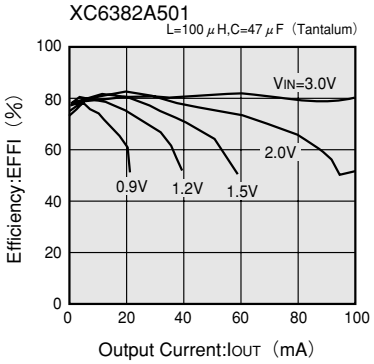
(1) OUTPUT VOLTAGE vs. OUTPUT CURRENT



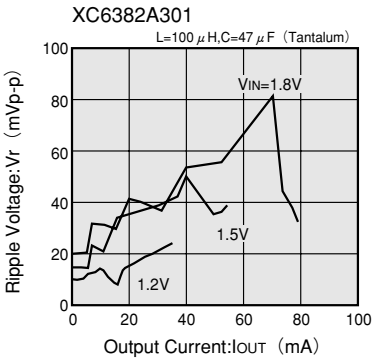


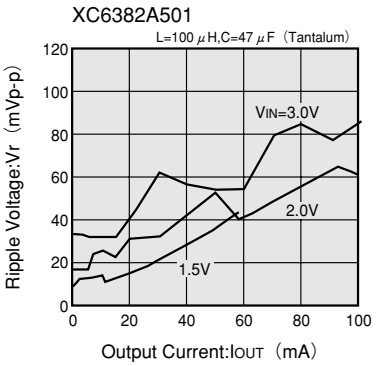
(2) EFFICIENCY vs. OUTPUT CURRENT





(3) RIPPLE VOLTAGE vs. OUTPUT CURRENT





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