

### Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

#### **Features and Benefits**

Frequency range: 20MHz-50MHz Supply voltage: 1.8V/2.5V/3.3V Current: 10mA Max. Frequency stability vs. temperature: ±25PPM-100PPM Aging: ±3PPM 1<sup>st</sup> year Operating temperature: -40°C to +85°C Size: 5.0x3.2x1.2 mm

#### **Typical Applications**

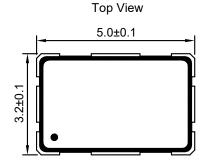
- Wearable device
- Sport Video Cams
- Ultra-small Notebook PC
- Mobile Phones
- -Digital Circuit

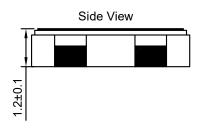
#### **Description**

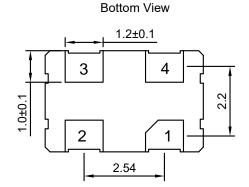
XO5032BL-ULJ\_CMOS is the ultra-low jitter crystal oscillator. The RMS phase jitter can be 48fs typical. It can be widely used in the digital circuit and communication applications.

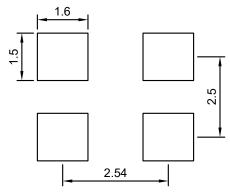
#### **Mechanical Drawing & Pin Connections**











Land Pattern

PIN	Function
#1	OE
#2	GND
#3	Output
#4	Supply Voltage

Dynamic Engineers reserves the right to make changes to the company datasheet(s) along with other information contained inside, such as data tables and araphs without notification to potential customers who may have earlier revisions in their possession.

Unit in mm 1mm = 0.0394 inches

Dynamic Engineers, Inc.

Rev. 1



# Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

## **Specifications**

Specification         Jun.         Typ.         Max.           Operational Frequency         fo         20         50         MHz           Output Load         15         pF         Output Level High         90%Vcc         V           Output Level High         90%Vcc         1.5         pF         Output Level Low         V           Rise / Fall Time         @10%-90% of Vcc         1.5         5         ns         supply           Duty Cycle         45         .55         %         Supply         voltage           Duty Cycle         45         .55         %         V         For 3.3V           Startup Time         0.8         5         ms         Output Level Low         Voltage           Output Lable/Disable         Enable output         70%Vcc         V         V         For 3.3V           Fanction on PIN1         Disable output         30%Vcc         V         V         For 3.3V           Power Supply         Vcc         1.8/2.5/3.3         V         See ordering section           Current         Vcc = 1.8V         3         25         uA           Vcc = 2.5V         5         30         uA         Vcc = 3.3V         9         35	Oscillator		Openalitien	Value			Unit	Note	
RF Output Output Load         Image: Constraint of the second	Specification	Sym	Condition	Min.	Тур.	Max.			
Output Load         15         pF           Output Level High         90%Vcc         10%Vcc         V           Rise / Fall Time         @10%-90% of Vcc         1.5         5         ns         Supply voltage           Duty Cycle         45         55         %         Supply voltage         V         V           Startup Time         0.8         5         ms         voltage         V         V           Function on PIN1         Disable output         70%Vcc         V         V         V           Fower Supply         Enable/         1         ms         V         V           Power Supply         Vcc         1.8/2.5/3.3         V         See ordering section           Current         Vcc =1.8V         3         5         mA           Current With Output Disable         Vcc =1.8V         3         25         uA           Vcc =3.3V         7         10         mA         Vcc =3.0V         7           Supply Voltage Vs. Frequency Stability         @25°C         ±1.0         ppm         See ordering section           Vs. Temperature         @10Hz         -68         dBc/Hz         48         300         fs           MS Jitter <t< th=""><th>Operational Frequency</th><th>f<sub>0</sub></th><th></th><th>20</th><th></th><th>50</th><th>MHz</th><th></th></t<>	Operational Frequency	f <sub>0</sub>		20		50	MHz		
Output Level High         90%Vcc         V           Output Level Low         10%Vcc         V           Rise / Fall Time         @10%-90% of Vcc         1.5         5         ns         Supply voltage           Duty Cycle         45         55         %         Supply voltage         V         For 3.3V           Duty Cycle         45         55         %         V         For 3.3V         Supply voltage           Duty Cycle         45         0.8         5         ms         Output Enable/Disable         V         For 3.3V           Function on PIN1         Disable output         70%Vcc         V         V         For 3.3V           Power Supply         Enable         1         ms         See ordering section           Votage         Vcc         1.8/2.5/3.3         V         See ordering section           Current         Vcc =1.8V         3         5         mA           Current With Output Disable         Vcc =1.8V         3         25         UA           Vcc =3.3V         7         10         mA         See ordering section           Supply Voltage Vs.         @ 25°C         ±1.0         ppm         See ordering section           Vcc =3.3V	RF Output								
Output Level Low         Image: Constraint of the system of the syst	Output Load				15		pF		
Action         Action         For 3.3V           Rise / Fall Time         @ 10%-90% of Vcc         1.5         5         ns         supply voltage           Duty Cycle         45         55         %         supply voltage         V           Startup Time         0.8         5         ms         Output Enable/Disable         V         V           Function on PIN1         Disable output         70%Vcc         V         V         V           Enable/Disable Time         Enable         1         ms         0.8         5         ms           Power Supply         Enable         1         ms         200         ns         V           Current         Vcc         1.8/2.5/3.3         V         See ordering section           Current With Output         Vcc = 1.8V         3         5         mA           Current With Output         Vcc = 2.5V         5         30         uA           Supply Votage Vs.         @ 25°C         ±1.0         ppm           Strequency Stability         @ 25°C         ±1.0         ppm           Vs. Temperature         @ 40°C to +85°C         ±25         ppm           Aging@+25°C         1*1 oppm         P         See order	Output Level High			90%Vcc			•		
Rise / Fall Time         @10%-90% of V <sub>sc</sub> 1.5         5         ns         supply voltage           Duty Cycle         45         55         %                   Startup Time         0.8         5         ms   N	Output Level Low					10%Vcc	V		
Startup Time         Image: Constraint of the system o	Rise / Fall Time		@10%-90% of $V_{cc}$		1.5	5	ns	supply	
Output Enable/Disable Function on PIN1         Enable output         70% V <sub>cc</sub> V           Enable/Disable Time         Enable         1         ms           Enable/Disable Time         Disable         200         ns           Power Supply         Vcc         1.8/2.5/3.3         V         See ordering section           Voltage         V <sub>cc</sub> 1.8/2.5/3.3         V         See ordering section           Current         V <sub>cc</sub> = 2.5V         5         7         mA           Current With Output         V <sub>cc</sub> = 3.3V         7         10         mA           Current With Output         V <sub>cc</sub> = 3.3V         5         uA            Supply Voltage Vs.         © 25°C         5         30         uA           Frequency Stability         © 25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm             MS Jitter         @10Hz         -668         dBc/Hz            @10Hz         -102         dBc/Hz           @10Hz	Duty Cycle			45		55	%		
Function on PIN1         Disable output         30%Vcc         V           Enable/Disable Time         Enable         1         ms           Power Supply         200         ns         200         ns           Power Supply         18/2.5/3.3         V         See ordering section           Current         Vcc         1.8/2.5/3.3         V         See ordering section           Current With Output Disable         Vcc = 1.8V         3         5         mA           Current With Output Disable         Vcc = 1.8V         3         25         uA           Supply Yottage Vs.         5         30         uA         -           Frequency Stability         Vcc = 3.3V         7         10         mA           Supply Yottage Vs.         @ 25°C         ±1.0         ppm           Frequency Stability         @ 25°C         ±1.0         ppm           Vs. Temperature         @ -40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         See ordering section           Aging@1425°C         1st year         ±3.0         ppm         See ordering section           Aging@1425°C         1st year         ±102<	Startup Time				0.8	5	ms		
Enable/Disable Time         Enable         1         ms           Power Supply         Disable         200         ns           Vottage         V <sub>cc</sub> 1.8/2.5/3.3         V         See ordering section           Current         V <sub>cc</sub> =1.8V         3         5         mA           V <sub>cc</sub> =3.3V         7         10         mA           Current With Output Disable         V <sub>cc</sub> =1.8V         3         25         uA           V <sub>cc</sub> =2.5V         5         30         uA         0         0           Current With Output Disable         V <sub>cc</sub> =2.5V         5         30         uA         0           Supply Voltage Vs. Frequency Stability         @ 25°C         ±1.0         ppm         See ordering section           Supply Voltage Vs. Frequency Sensitivity         @ 25°C         ±1.0         ppm         See ordering section           Vs. Temperature         @ -40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         See ordering section           MS Jitter         (12KHz -20MHz)         -68         dBc/Hz         -68         dBc/Hz           @ 10Hz         -68         dBc/Hz         -68	Output Enable/Disable		Enable output	70%V <sub>cc</sub>			V		
Disable         Disable         200         ns           Power Supply         Vcc         1.8/2.5/3.3         V         See ordering section           Current         Vcc = 1.8V         3         5         mA           Current         Vcc = 2.5V         5         7         mA           Vcc = 3.3V         7         10         mA           Current With Output Disable         Vcc = 1.8V         3         25         uA           Vcc = 3.3V         7         10         mA	Function on PIN1		Disable output			30%V <sub>cc</sub>	V		
Power Supply         Unitable         Disable         200         ns           Voltage         V <sub>cc</sub> 1.8/2.5/3.3         V         See ordering section           Current         V <sub>cc</sub> = 2.5V         3         5         mA           Current With Output         V <sub>cc</sub> = 3.3V         7         10         mA           Current With Output         V <sub>cc</sub> = 3.3V         7         10         mA           Disable         V <sub>cc</sub> = 3.3V         3         25         uA           Disable         V <sub>cc</sub> = 3.3V         9         35         uA           Frequency Stability         V <sub>cc</sub> = 3.3V         9         35         uA           Supply Voltage Vs. Frequency Stability         @25°C         ±1.0         ppm           Supply Voltage Vs. Frequency Sensitivity         @25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         section           RMS Jitter (12KHz-20MHz)         @10Hz         -68         dBc/Hz         @10CHz           Phase Noise (25MHz, 3.3V)         @10KHz         -1157         dBc/Hz         @10KHz         .166	Enchle/Dischle Time		Enable			1	ms		
Voltage         V <sub>cc</sub> I.8/2.5/3.3         V         See ordering section           Current         V <sub>cc</sub> =1.8V         3         5         mA           Current         V <sub>cc</sub> =2.5V         5         7         mA           Current With Output Disable         V <sub>cc</sub> =3.3V         7         10         mA           Current With Output Disable         V <sub>cc</sub> =2.5V         5         30         uA           V <sub>cc</sub> =3.3V         9         35         uA         -           Supply Voltage Vs. Frequency Stability         @25°C         ±1.0         ppm         See ordering section           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1 <sup>st</sup> year         ±3.0         ppm         See ordering section           RMS Jitter         (12KHz-20MHz)         @10Hz         -68         dBc/Hz         -           Phase Noise         @110Hz         -102         dBc/Hz         -         -         -           @10KHz         -139         dBc/Hz         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	Enable/Disable Time		Disable			200	ns		
Voitage         V <sub>cc</sub> 1.8/2.5/3.3         V         section           Current         V <sub>cc</sub> =1.8V         3         5         mA           V <sub>cc</sub> =2.5V         5         7         mA           Current With Output Disable         V <sub>cc</sub> =1.8V         3         25         uA           V <sub>cc</sub> =2.5V         5         30         uA           Prequency Stability         V <sub>cc</sub> =2.5V         5         30         uA           Supply Voltage Vs.         9         35         uA           Frequency Stability         @25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±25         ppm           Aging@+25°C         1st year         ±3.0         ppm           RMS Jitter         (12KHz-20MHz)         @10Hz         -68         dBc/Hz           @ @10Hz         -102         dBc/Hz         @10Hz           @ @10Hz         -1102         dBc/Hz         @10Hz           @ @100Hz         -1102 <td< td=""><td>Power Supply</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Power Supply								
Current         V <sub>cc</sub> =2.5V         5         7         mA           V <sub>cc</sub> =3.3V         7         10         mA           Current With Output Disable         V <sub>cc</sub> =1.8V         3         25         uA           V <sub>cc</sub> =2.5V         5         30         uA           Frequency Stability         V <sub>cc</sub> =3.3V         9         35         uA           Supply Voltage Vs. Frequency Sensitivity         @25°C         ±1.0         ppm         See ordering section           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm           RMS Jitter (12KHz-20MHz)          48         300         fs           @10Hz         -68         dBc/Hz            @10Hz         -102         dBc/Hz           @10KHz         -1170         dBc/Hz           @10KHz         -166         dBc/Hz           @10KHz         -166         dBc/Hz           <	Voltage	Vcc			1.8/2.5/3.3		V		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$							mA		
Current With Output Disable         V <sub>cc</sub> =1.8V         3         25         uA $V_{cc} = 2.5V$ 5         30         uA           V <sub>cc</sub> =3.3V         9         35         uA           Frequency Stability           Supply Voltage Vs. Frequency Sensitivity         @25°C $\pm 1.0$ ppm           Vs. Temperature         @-40°C to +85°C $\pm 25$ ppm         See ordering section           Aging@+25°C         1 <sup>st</sup> year $\pm 3.0$ ppm         See ordering section           RMS Jitter (12KHz-20MHz)         @10Hz         -68         dBc/Hz            @10Hz         -68         dBc/Hz           @10Hz            Phase Noise (25MHz,3.3V)         @10Hz         -157         dBc/Hz <td>Current</td> <td></td> <td>V<sub>cc</sub> =2.5V</td> <td></td> <td>5</td> <td>7</td> <td>mA</td> <td></td>	Current		V <sub>cc</sub> =2.5V		5	7	mA		
Understand $V_{cc} = 2.5V$ 530uADisable $V_{cc} = 3.3V$ 935uAFrequency Stability $@25^{\circ}C$ $\pm 1.0$ ppmSupply Voltage Vs. Frequency Sensitivity $@25^{\circ}C$ $\pm 1.0$ ppmVs. Temperature $@-40^{\circ}C$ to $+85^{\circ}C$ $\pm 25$ ppmSee ordering sectionAging@+25^{\circ}C1st year $\pm 3.0$ ppmRMS Jitter (12KHz-20MHz) $@10Hz$ -68dBc/HzPhase Noise (25MHz,3.3V) $@10Hz$ -102dBc/Hz@ 10KHz-139dBc/Hz@ 10KHz-170dBc/Hz@ 10KHz-170dBc/Hz@ 10KHz-170dBc/Hz@ 10KHz-170dBc/Hz@ 10KHz-166dBc/Hz@ 10KHz-168dBc/Hz@ 10KHz-168dBc/Hz@ 10KHz-168dBc/Hz			V <sub>cc</sub> =3.3V		7	10	mA		
DisableVcc = 2.5V530UAFrequency StabilityVcc = 3.3V935uASupply Voltage Vs. Frequency Sensitivity $@25^{\circ}$ C $\pm 1.0$ ppmVs. Temperature $@-40^{\circ}$ C to +85°C $\pm 25$ ppmSee ordering sectionAging@+25^{\circ}C1st year $\pm 3.0$ ppmRMS Jitter (12KHz-20MHz) $@10Hz$ -68dBc/HzPhase Noise (25MHz,3.3V) $@10Hz$ -102dBc/Hz@10KHz-157dBc/Hz@10KHz-157dBc/Hz@10KHz-170dBc/Hz@10KHz-166dBc/Hz@10KHz-166dBc/Hz@10KHz-168dBc/Hz@10KHz-168dBc/Hz@10KHz-166dBc/Hz@10KHz-168dBc/Hz@10KHz-168dBc/Hz@10KHz-168dBc/Hz@10KHz-168dBc/Hz	Current With Output		V <sub>cc</sub> =1.8V		3	25	uA		
V <sub>cc</sub> = 3.3V         9         35         uA           Frequency Stability         @ 25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±1.0         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         See ordering section           RMS Jitter (12KHz-20MHz)         1st year         ±3.0         ppm         See ordering section           Phase Noise (25MHz,3.3V)         @10Hz         -68         dBc/Hz            @10KHz         -102         dBc/Hz             @10KHz         -157         dBc/Hz             @10KHz         -170         dBc/Hz             @10KHz         -166         dBc/Hz             @10KHz         -168         dBc/Hz             @10KHz         -168         dBc/Hz             @10KHz         -168         dBc/Hz			V <sub>cc</sub> =2.5V			30	uA		
Supply Voltage Vs. Frequency Sensitivity@25°C±1.0ppmVs. Temperature@-40°C to +85°C±25ppmSee ordering sectionAging@+25°C1st year±3.0ppmRMS Jitter (12KHz-20MHz)@10Hz-68dBc/Hz@10Hz-68dBc/HzPhase Noise (25MHz,3.3V)@10KHz-102dBc/Hz@10KHz-157dBc/Hz@10KHz-157dBc/Hz@10KHz-166dBc/Hz@10KHz-166dBc/Hz@10KHz-166dBc/Hz@10KHz-168dBc/Hz	Disable		V <sub>cc</sub> =3.3V		9	35	uA		
Frequency Sensitivity@25°C±1.0ppmVs. Temperature@-40°C to +85°C±25ppmSee ordering sectionAging@+25°C1st year±3.0ppmRMS Jitter (12KHz-20MHz)@10Hz-68dBc/Hz@10Hz-68dBc/HzPhase Noise (25MHz,3.3V)@10KHz-102dBc/Hz@100KHz-157dBc/Hz@100KHz-157dBc/Hz@100KHz-166dBc/Hz@100KHz-166dBc/Hz@100KHz-166dBc/Hz@100KHz-168dBc/Hz									
Vs. Temperature         @-40 C to +85 C         ±25         ppm         section           Aging@+25°C         1st year         ±3.0         ppm         section         section           RMS Jitter         12KHz-20MHz)         48         300         fs         fs         section           Phase Noise         @10Hz         -68         dBc/Hz         dBc/Hz         dBc/Hz         section           (25MHz,3.3V)         @10KHz         -1102         dBc/Hz         section         section         section           @10KHz         -139         dBc/Hz         section         section         section         section           @10KHz         -139         dBc/Hz         section         section         section         section           @10KHz         -157         dBc/Hz         section         section         section         section           @100KHz         -1700         dBc/Hz         section         section         section         section           @10MHz         -166         dBc/Hz         section         section         section         section           @10KHz         -168         dBc/Hz         section         section         section         section           @			@25°C			±1.0	ppm		
RMS Jitter (12KHz-20MHz)         48         300         fs           @10Hz         -68         dBc/Hz           @100Hz         -102         dBc/Hz           @100Hz         -102         dBc/Hz           @100Hz         -139         dBc/Hz           @10KHz         -139         dBc/Hz           @10KHz         -157         dBc/Hz           @100KHz         -157         dBc/Hz           @100KHz         -166         dBc/Hz           @10KHz         -166         dBc/Hz           @10KHz         -168         dBc/Hz           @1MHz         -168         dBc/Hz           @25MHz         -168         dBc/Hz	Vs. Temperature		@-40°C to +85°C			±25	ppm		
(12KHz-20MHz)         48         300         15           (12KHz-20MHz)         (10Hz)         -68         dBc/Hz           (100Hz)         -102         dBc/Hz           (100Hz)         -102         dBc/Hz           (100Hz)         -102         dBc/Hz           (100Hz)         -102         dBc/Hz           (100Hz)         -139         dBc/Hz           (100KHz)         -157         dBc/Hz           (100KHz)         -170         dBc/Hz           (100KHz)         -166         dBc/Hz           (100KHz)         -168         dBc/Hz           (100KHz)         -168         dBc/Hz           (100KHz)         -168         dBc/Hz			1 <sup>st</sup> year			±3.0	ppm		
@100Hz         -102         dBc/Hz           @1KHz         -139         dBc/Hz           (25MHz,3.3V)         @10KHz         -157         dBc/Hz           @100KHz         -170         dBc/Hz           @100KHz         -166         dBc/Hz           @1MHz         -166         dBc/Hz           @1MHz         -168         dBc/Hz           @10CKHz         -168         dBc/Hz					48	300	fs		
Phase Noise (25MHz,3.3V)         @1KHz         -139         dBc/Hz           @10KHz         -157         dBc/Hz           @100KHz         -170         dBc/Hz           @100KHz         -170         dBc/Hz           @100KHz         -166         dBc/Hz           @1MHz         -166         dBc/Hz           @5MHz         -168         dBc/Hz           Operating temperature range         -40°C to +85°C (See ordering section)         -40°C to +85°C (See ordering section)			@10Hz		-68		dBc/Hz		
Phase Noise         @10KHz         -157         dBc/Hz           (25MHz,3.3V)         @100KHz         -170         dBc/Hz           @10Hz         -166         dBc/Hz           @1MHz         -166         dBc/Hz           @5MHz         -168         dBc/Hz           @operating temperature range         -40°C to +85°C (See ordering section)         -40°C to +85°C (See ordering section)			@100Hz		-102		dBc/Hz		
(25MHz,3.3V)         @10KHz         -157         dBc/Hz           @100KHz         -170         dBc/Hz           @10Hz         -166         dBc/Hz           @1MHz         -166         dBc/Hz           @5MHz         -168         dBc/Hz           Coperating temperature range         -40°C to +85°C (See ordering section)         -40°C to +85°C (See ordering section)	Dhase Maine		@1KHz		-139		dBc/Hz		
@100KHZ     -170     dBc/Hz       @1MHz     -166     dBc/Hz       @5MHz     -168     dBc/Hz   Environmental Conditions Operating temperature range -40°C to +85°C (See ordering section)			@10KHz		-157		dBc/Hz		
@5MHz     -168     dBc/Hz       Environmental Conditions     -40°C to +85°C (See ordering section)     -40°C to +85°C (See ordering section)			@100KHz		-170		dBc/Hz		
Environmental ConditionsOperating temperature range-40°C to +85°C (See ordering section)			@1MHz		-166		dBc/Hz		
Environmental ConditionsOperating temperature range-40°C to +85°C (See ordering section)			@5MHz						
	Environmental Condition	ns	·		·			·	
	Operating temperature rai	nge	-40°C to +85°C (See	ordering se	ection)				
	Storage temperature range		-55°C to +150 °C	<u> </u>	e.				

Dynamic Engineers reserves the right to make changes to the company datasheet(s) along with other information contained inside, such as data tables and araphs without notification to potential customers who may have earlier revisions in their possession.



# Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

### **Ordering Information**

XO5032BL-ULJ_CMOS	-	xMHz	-01	02	03
Group			Co	de	

For example, XO5032BL-ULJ\_CMOS -25MHz-111 denotes the XO has the following specifications:

Frequency:	25MHz
Temperature Range:	-10°C to +70°C
Stability Over Temperature:	±25 ppm
Supply Voltage:	1.8V

01	Temperature Range	
Code	Specification	
1	-10°C to +70°C	
2	-40°C to +85°C	

02	Frequency Stability
Code	Specification
1	±25 ppm
2	±50 ppm
3	±100 ppm

03	Supply Voltage
Code	Specification
1	1.8 V ±5%
2	2.5 V ±10%
3	3.3 V ±10%

5