

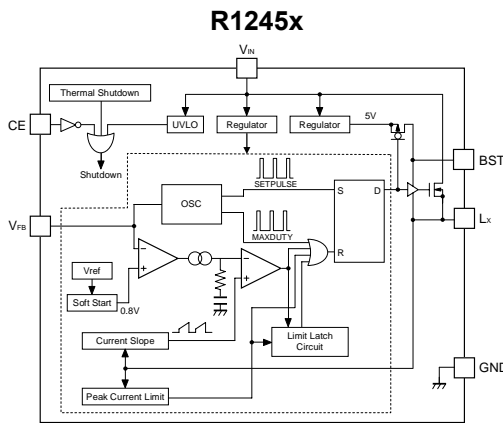
## 1.2A\* 30V Input PWM Step-down DC/DC Converter

The R1245x Series are 30V input, CMOS-based PWM step-down DC/DC converters featuring 1.2A\* output current. R1245x includes a soft start circuit and latch or fold-back protection circuit. By simply using an inductor, resistors, a diode, and capacitors as external components, a high-efficiency step-down DC/DC converter can be easily configured. Due to current mode PWM control, the R1245x provides a fast response and high efficiency. Ceramic output capacitors can be used. Compared with R1240x, R1245x has a lot of variation of oscillator frequency and can select 330kHz. In case of 330kHz, R1245x can set  $V_{OUT}$  lower than R1240x. The oscillator maximum duty cycle (Min.) of R1245x is larger than R1240x, so it is suitable for low dropout voltage situation. The noise characteristic has been improved rather than R1240x, and voltage accuracy is also improved. In addition to HSOP-8E package can be selected, so R1245S is suitable for high power dissipation case.

### FEATURES

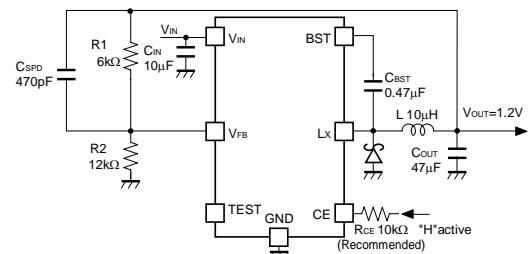
- Supply Current ( $I_{DD}$ ) ..... Typ. 500 $\mu$ A ( $V_{IN}=30V$ , SET  $V_{FB}=1.0V$ )
  - Standby Current ( $I_{standby}$ ) ..... Max. 5 $\mu$ A ( $V_{IN}=30V$ , In standby)
  - Input Voltage Range ( $V_{IN}$ ) ..... 4.5V to 30.0V
  - Output Voltage Range ( $V_{OUT}$ ) ..... Externally adjustable from 0.8V (Feedback voltage : 0.8V)
  - Feedback Voltage Accuracy .....  $\pm 1\%$
  - Output Current ( $I_{OUT}$ ) ..... 1.2A\*
  - Oscillator Frequency ( $f_{OSC}$ ) ..... 330kHz(A/B), 500kHz(C/D), 1MHz(E/F), 2.4MHz(G/H)
  - Oscillator Maximum Duty Cycle ..... Min. 92%(A/B), Min. 95%(C/D), Min. 90%(E/F), Min. 80%(G/H)
  - UVLO Detect Voltage ( $V_{UVLO}$ ) ..... Typ. 3.8V
  - Soft Start Time ( $t_{start}$ ) ..... Typ. 1ms
  - High Side Switch Limit Current ..... Typ. 2A
  - Thermal Shutdown Circuit ..... Stops at 160°C.
  - Latch Protection Circuit ..... Delay time for protection Typ. 4ms (A/C/E/G) Fold-back frequency Typ. 170kHz (B/D) , Typ. 250kHz (F) Typ. 300kHz (H)
  - Fold-back Protection Circuit ..... Delay time for protection Typ. 4ms (A/C/E/G) Fold-back frequency Typ. 170kHz (B/D) , Typ. 250kHz (F) Typ. 300kHz (H)
  - Packages ..... DFN(PLP)2020-8, SOT-23-6W, HSOP-8E
- \*) This is an approximate value, because output current depending on conditions and external parts.

### BLOCK DIAGRAM



### TYPICAL APPLICATION

R1245x00xA/B ( $V_{OUT}=1.2V$ ,  $V_{IN}=24.0V$ )



CSPD : Speed-up capacitor  
CIN, COUT : Ceramic capacitors can be used.  
CBST : Bootstrap Capacitor  
R1, R2 : Resistors for setting output voltage  
TEST pin should be open.

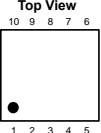
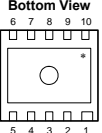
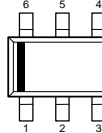
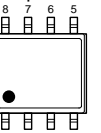
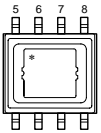
### SELECTION GUIDES

Halogen Free	Package	Q'ty per Reel	Part No.
H/F	DFN(PLP)2020-8	5,000 pcs	R1245K003*-TR
H/F	SOT-23-6W	3,000 pcs	R1245N001*-TR-FE
H/F	HSOP-8E	1,000 pcs	R1245S003*-E2-FE

\* : Specify a combination of the oscillator frequency and the protection circuit.

- (A) 330kHz, Latch type (B) 330kHz, Fold-back type
- (C) 500kHz, Latch type (D) 500kHz, Fold-back type
- (E) 1MHz, Latch type (F) 1MHz, Fold-back type
- (G) 2.4MHz, Latch type (H) 2.4MHz, Fold-back type

### PACKAGES

DFN (PLP) 2020-8		SOT-23-6W		HSOP-8E	
<p>Top View</p> 	<p>Bottom View</p> 		<p>Top View</p> 	<p>Bottom View</p> 	
1 Lx	5 GND	1 BST	1 Lx	5 GND	
2 VIN*3	6 VFB	2 GND	2 VIN	6 VFB	
3 VIN*3	7 TEST*2	3 VFB	3 CE	7 NC	
4 CE	8 BST	4 CE	4 TEST*2	8 BST	
		5 VIN			
		6 Lx			

\*) The tab is substrate level (GND).

\*2) TEST pin should be open.

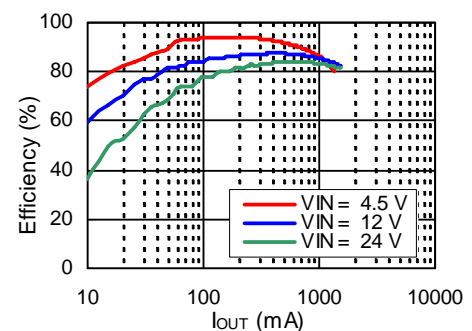
\*3) The  $V_{IN}$  pin must be wired together when it is mounted on board

### APPLICATIONS

- Power source for digital home appliances such as digital TVs and DVD players
- Power source for office automation equipment such as printers and fax machines
- Power source for hand-held communication equipment, cameras, and VCRs
- Power source for battery-powered equipment

### TYPICAL CHARACTERISTIC

R1245x00A/B Efficiency vs. Output Current  
 $V_{OUT}=3.3V$



## 1.2A 30V Input PWM Step-down DC/DC Converter

## R1245x Series / R1240x Series

## Step-down DC/DC Converter Comparison

	R1245x Series	R1240x Series	
Control	Fixed PWM	Fixed PWM	
Oscillator Frequency (Typ.)	330kHz (A/B) 500kHz (C/D) 1MHz (E/F) 2.4MHz (G/H)	1.25MHz	
Oscillator Maximum Duty Cycle (Min.)	92% (A/B) 95% (C/D) 90% (E/F) 80% (G/H)	75%	
Soft-start Time (Typ.)	1ms	0.4ms	
Latch Protection Circuit Delay time for protection (Typ.)	4ms (A/C/E/G)	2ms (A)	
Fold-back Protection Circuit Fold-back frequency (Typ.)	170kHz (B/D) 250kHz (F) 300kHz (H)	310kHz (B)	
Package	DFN(PLP)2020-8 SOT-23-6W* HSOP-8E	DFN(PLP)2527-10 SOT-23-6W*	
Version	Latch Protection Circuit	Fold-back Protection Circuit	A : Latch Protection Circuit      B : Fold-back Protection Circuit
	A : 330kHz C : 500kHz E : 1MHz G : 2.4MHz	B : 330kHz D : 500kHz F : 1MHz H : 2.4MHz	

\*) R1245N and R1240N are the same pin-layout, but these are upside down.

## Ricoh Co.,LTD. Electronic Devices Company



■ Ricoh presented with the Japan Management Quality Award for 1999.  
Ricoh continually strives to promote customer satisfaction, and shares the achievements of its management quality improvement program with people and society.



■ Ricoh awarded ISO 14001 certification.

The Ricoh Group was awarded ISO 14001 certification, which is an international standard for environmental management systems, at both its domestic and overseas production facilities. Our current aim is to obtain ISO 14001 certification for all of our business offices.



Ricoh completed the organization of the Lead-free production for all of our products. After Apr. 1, 2006, we will ship out the lead free products only.  
Thus, all products that will be shipped from now on comply with RoHS Directive.

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