

# DC to DC Converter Tables

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# 1 Non-Isolated DC to DC Converters

What	Buck	Boost	Buck-Boost
Circuit Diagram			
ON Circuit			
OFF Circuit			
$V_o$ CCM	$V_o = DV_i$	$V_o = \frac{1}{1-D} V_i$	$V_o = \frac{D}{1-D} V_i$
$D$ CCM	$D = \frac{V_o}{V_i}$	$D = 1 - \frac{V_i}{V_o}$	
$V_o$ DCM		$V_o = V_i \frac{1 + \sqrt{1 + \frac{4D^2}{k}}}{2}$	$V_o = \frac{D}{\sqrt{k}} V_i$
$D$ DCM	$D = \frac{V_o}{V_i} \sqrt{\frac{k}{1 - \frac{V_o}{V_i}}}$		
$v_L$			

$i_L$			
$i_o$			
$v_S$			
$i_S$			
$v_D$			

$i_D$			
$i_C$			

## 2 Isolated DC to DC Converters

What	Forward	Flyback
Circuit Diagram		
ON Circuit		
OFF Circuit		
$v_L$		
$v_o$		

$v_{LM}$		
?		
?		

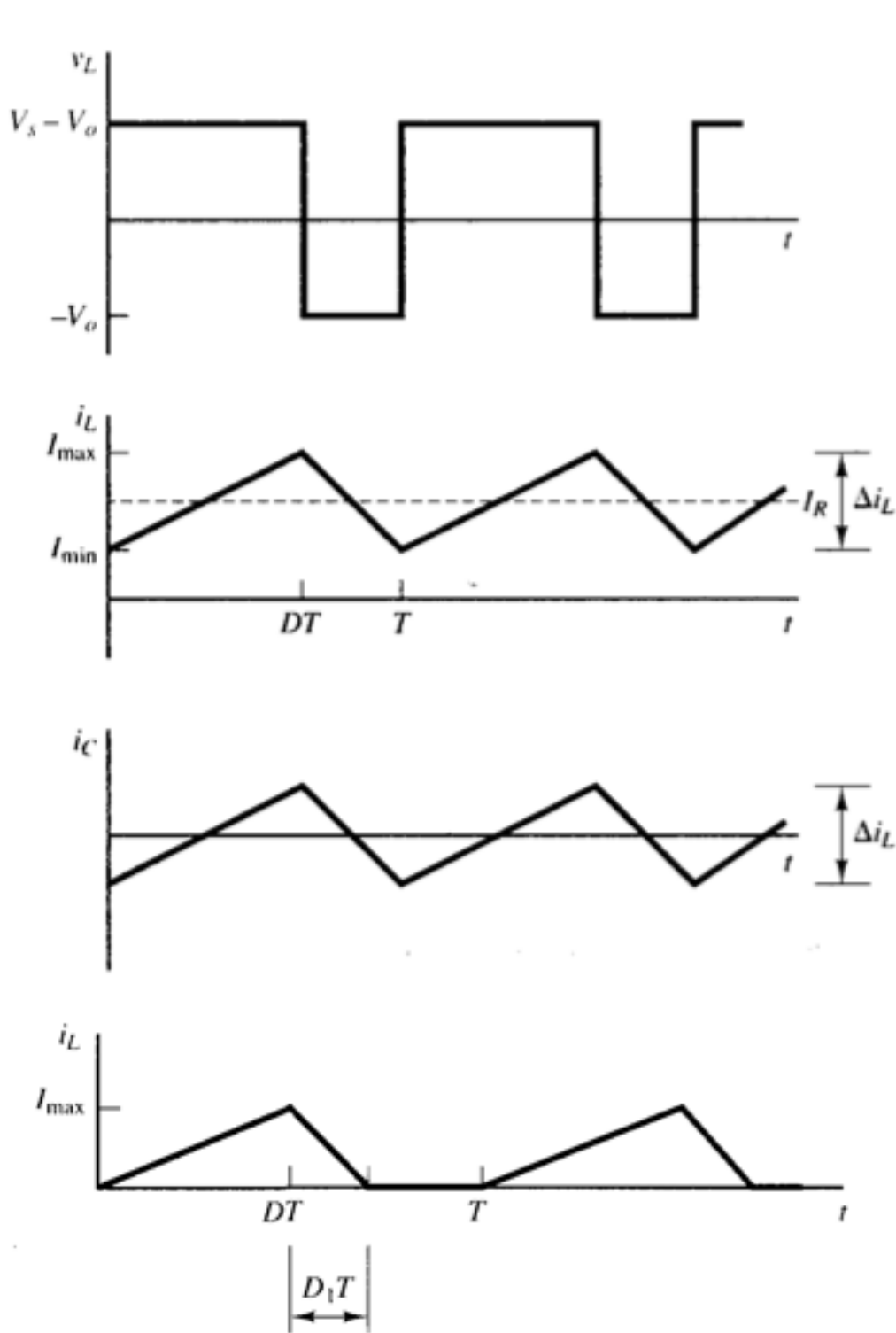
## 3 Waveforms

From *Electrónica de Potencia*, Daniel W. Hart.

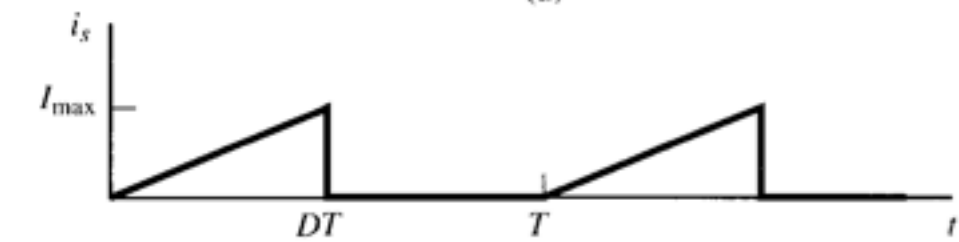




3.1 Buck



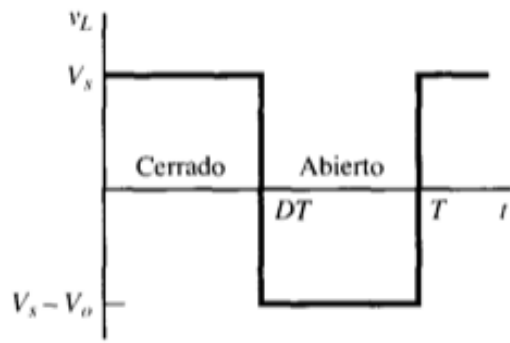
(a)



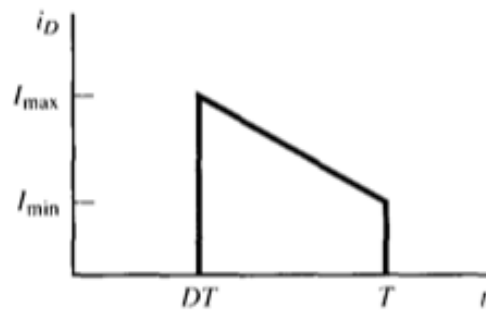
(b)



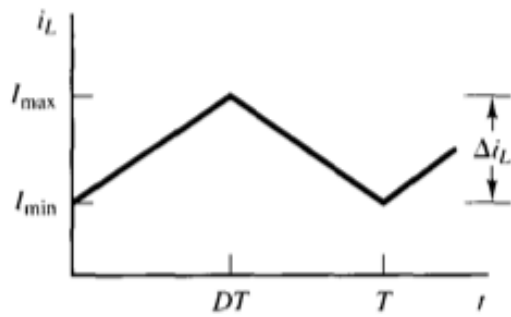
### 3.2 Boost



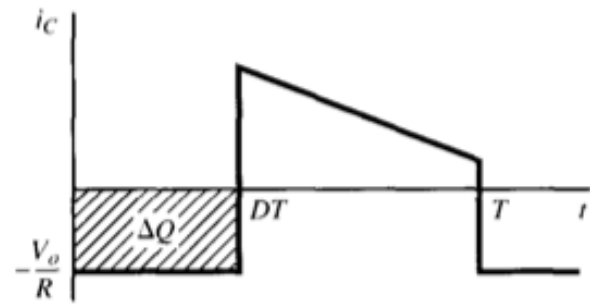
(a)



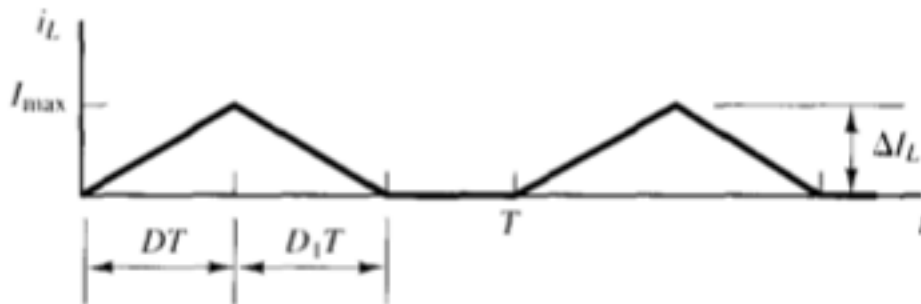
(c)



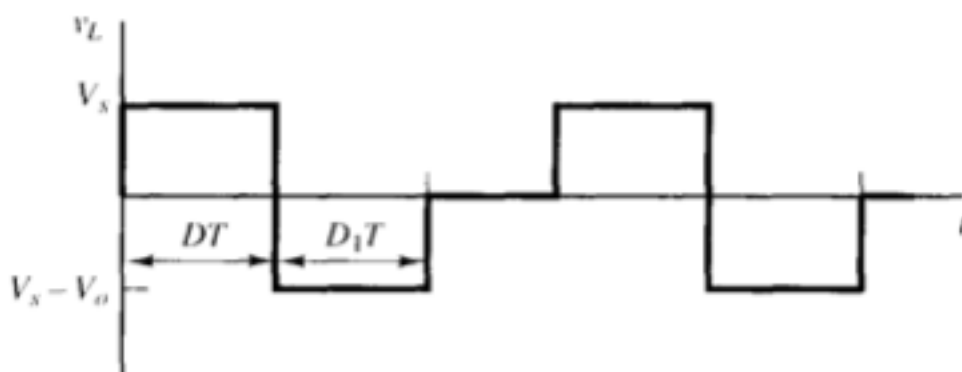
(b)



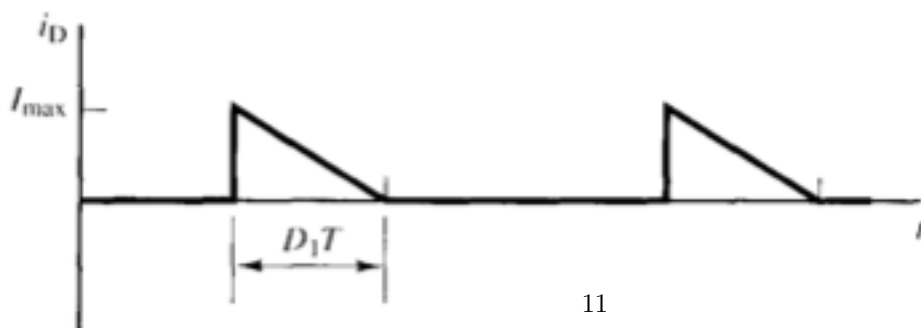
(d)



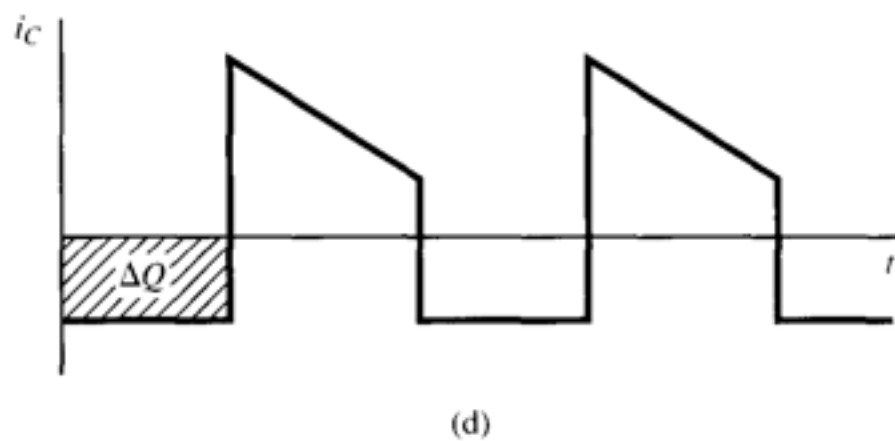
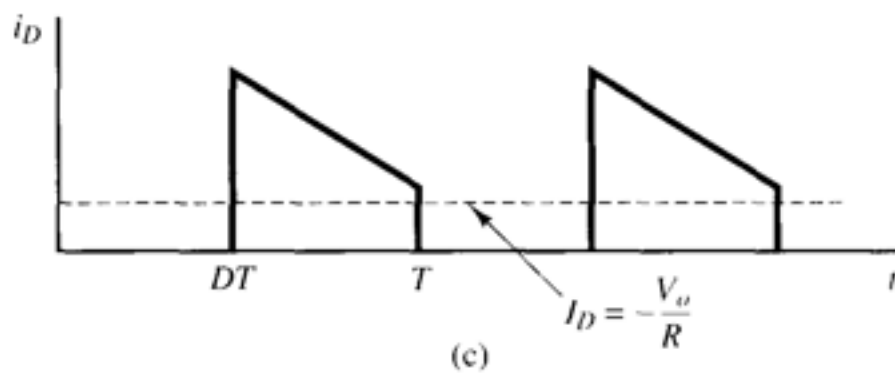
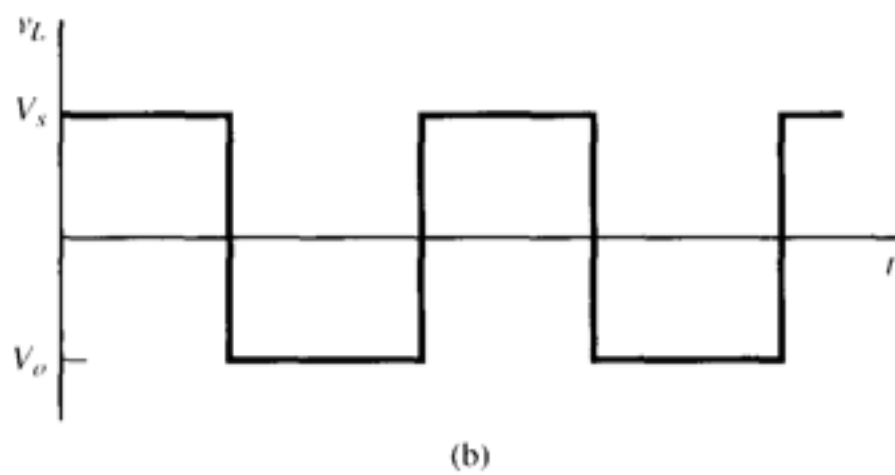
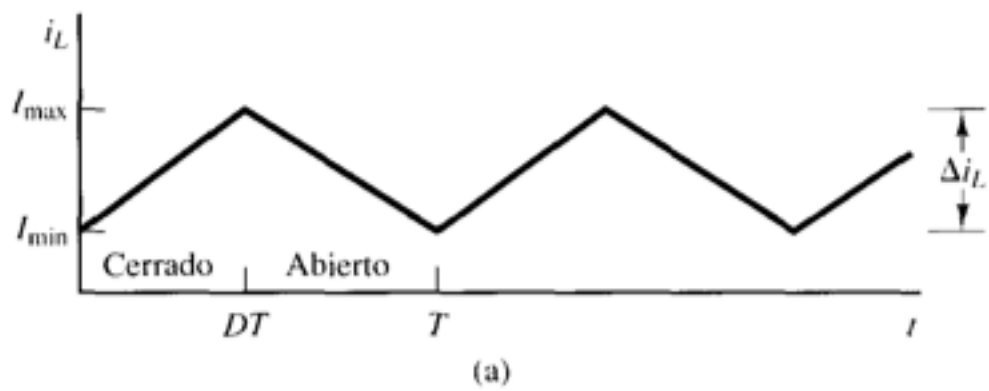
(a)



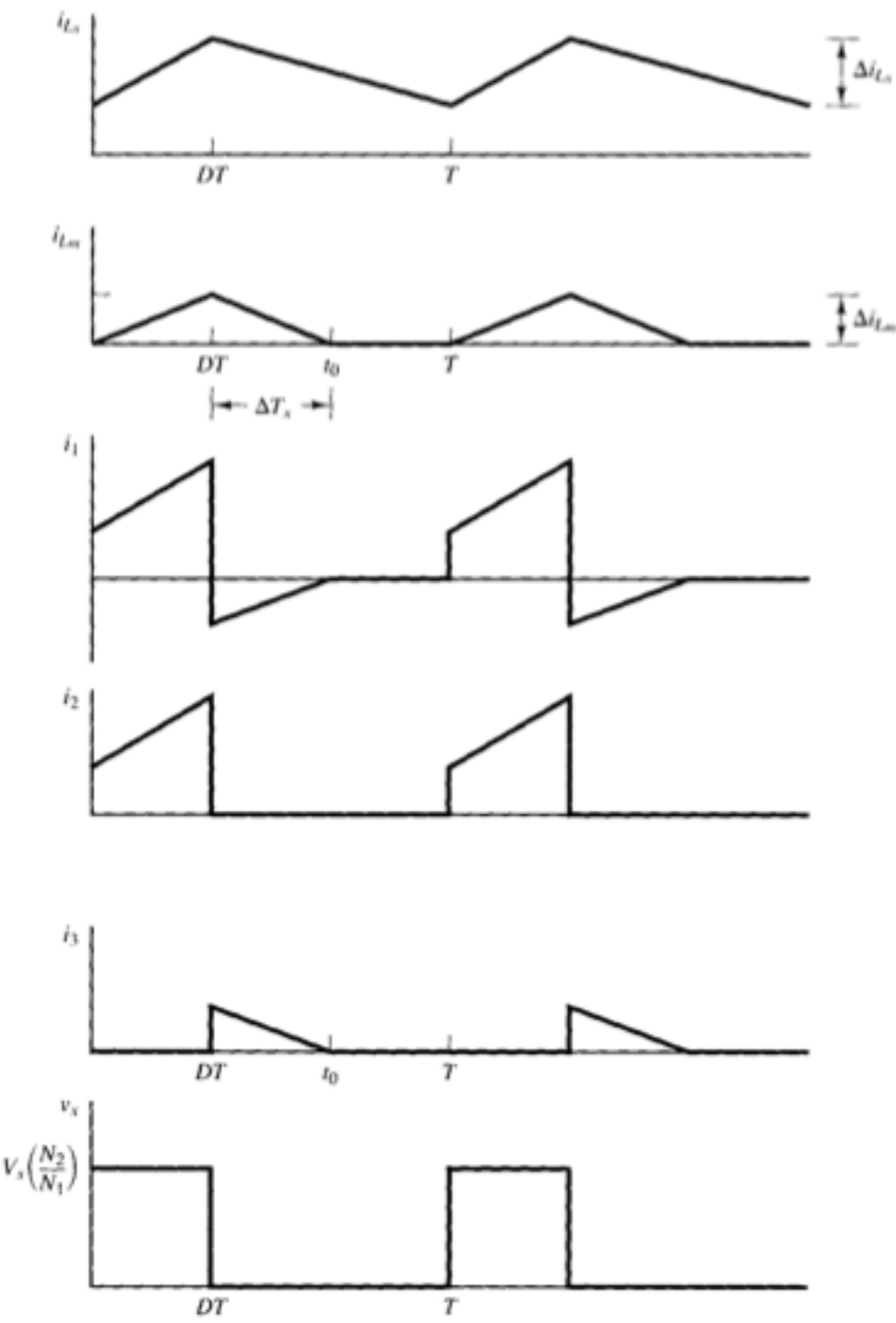
(b)



### 3.3 Buck-Boost



3.4 Forward



3.5 Flyback

