

# Power management: linear and switching regulators and voltage references

Selection guide



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# Linear voltage regulators

## Part number composition (family code + suffix)

Std positive	Std negative	Low drop	Very low drop
LMC38P	LMC37P	L4941PS	L4940PVVS
LMC50P	L79VVTCP	LD1117PVVCS	LD1580PVVS
LMC23P	L79LVVTCPS	KD1083PVVS	LD29080PVVS
LMC17PS		LD1084PVVS	LD29150PVVS
LMC17MPS		LD1085PVVS	LD29300PVVS
LMC17LPS		LD1086PVVS	LD2979PVVS
LM723PS		LD1117APVVS	LD3985PVVS
L78SVVTCP		LK112PVVS	LK115PVV
L78VVTCP		LK112SPVVS	STC2PVVS
L78MVVTCPS		KD1084TPVVS	L4931TPVVS
L78LVVTCPS		LD1585TPVVS	L4987TPVVS
			LD2980TPVVS
			LD2981TPVVS
			LD2982TPVVS
			LD2985TPVVS
			LM2931TPVVS
			KFVVTPS
			LEVVTPS
			LFVVTPS

P: Package suffix  
 VV: Voltage suffix  
 T: Tolerance

C: Temperature class  
 S: Shipment packaging (see table)

## Packages suffixes

Package	Very low drop	Low drop	Standard positive and negative	
			L78/79 series	LM series
D <sup>2</sup> PAK	D2T	D2T	D2T	D2T
D <sup>2</sup> PAK/A	D2M	D2M		
DIP				N
DDPAK	DT	DT	DT	DT
Flip-Chip5	J			
P <sup>2</sup> PAK	P2T			
PENTAWATT	V5V			
PPAK	PT			
SO-8	D	D	D	D
SOT223		S		
SOT23-5L	M	M		
SOT-89	U		U	
SPAK-5L	K5			
SPAK-7L	K7			
TO-220	V	V	V	T*
TO-220FP	P	P	P	
TO-3			T	K
TO-92	Z		Z	Z
TSOT23-5L	G			

\* SP for LM337

## Shipment suffixes

Tube	No suffix
T & R	13TR, 013TR, TR, -TR, R, -R
Amorpak	SP, -AP

## Standard positive linear voltage regulators

Family	$I_{O\max}$ [A]	Regulated output voltage [V]														$T_{ol}$ [%]	Packages																			
		3.3	5	5.2	6	7.5	8	8.5	9	10	12	15	18	20	24		Adj	D <sup>2</sup> PAK	DIP-14	DPAK	IPAK	SO-14	SO-8	SOT-89	TO-220	TO-220FP	TO-3	TO-92								
LMC38	5																1.2 to 32	4																		
LMC50																		1.2 to 32	4																	
LMC23	3																	4																		
L78S00	2		■			■			■	■	■	■	■	■	■	■		4								■			■						■	
LMC17	1.5																1.2 to 32	4	■									■	■							■
L7800			■	■	■		■	■	■		■	■	■	■	■	■		4	■		■							■	■							■
LMC17M	1																1.2 to 37	4			■	■						■								
L7800A			■		■		■			■		■	■	■	■	■		2	■										■							
L78M00	0.5		■		■		■			■		■	■	■	■	■		4			■	■						■								
L78M00A			■		■		■			■		■	■	■	■	■		2			■	■						■								
LM723	0.15																1.2 to 37	3		■				■												
L78L00	0.1	■	■		■		■			■		■	■	■	■	■		8							■	■										■
L78L00A			■	■		■		■			■		■	■	■	■		4								■	■									
LMC17L																	1.2 to 37	4							■											■

## Standard negative linear voltage regulators

Family	$I_{O\max}$ [A]	Regulated output voltage [V]														$T_{ol}$ [%]	Packages																			
		3.3	5	5.2	6	7.5	8	8.5	9	10	12	15	18	20	24		Adj	D <sup>2</sup> PAK	DIP-14	DPAK	IPAK	SO-14	SO-8	SOT-89	TO-220	TO-220FP	TO-3	TO-92								
LMC37	1.5																1.2 to 32	4										■					■			
L7900			■		■		■					■	■	■	■	■		4	■									■	■							
L79L00	0.1		■		■		■			■		■	■	■	■		8							■	■			■								■

C must be replaced by 1 or 2 or 3 (temperature class)



## Low drop linear voltage regulators

Family	$I_o$ max [A]	Regulated output voltage [V]														$V_d$ [V]	$T_{ol}$ [%]	Packages																
		1.2	1.3	1.5	1.6	1.7	1.8	2.1	2.5	2.7	2.8	2.85	3	3.2	3.3			3.6	3.8	4	5	6	8	9	12	Adj	D <sup>2</sup> PAK	D <sup>2</sup> PAK / A	DPAK	SOT23	SOT23-5L	SO-8	TO-220	TO-220FP
KD1083	7.5			■			■		■			■												1.25 to 8.5	1.4	2	■							■
KD1084				■			■		■			■							■						1.25 to 15	1.3	2	■	■	■				■
KD1084A				■			■		■			■			■				■						1.25 to 15	1.3	1	■	■	■				■
LD1084	5			■			■		■			■			■				■					1.25 to 28	1.3	1	■	■					■	
LD1585				■			■		■			■			■				■		■	■	■	1.25 to 28	1.2	1	■	■					■	
LD1085C	3			■			■		■			■			■				■		■	■	■	1.25 to 28	1.3	2			■					
LD1085				■			■		■			■			■				■		■	■	■	1.25 to 28	1.3	1	■	■					■	
LD1086	1.5			■			■		■			■			■				■		■	■	■	1.25 to 28	1.3	1	■	■	■				■	
L4941	1																								0.25	4	■		■				■	■
LD1117A							■					■			■				■					1.25 to 15	1.1	2			■	■		■	■	
LD1117xx		■					■					■			■				■					1.25 to 15	1.1	1			■	■		■	■	
LD1117xxC	0.8						■					■			■				■					1.25 to 15	1.1	2			■	■		■	■	
LK112S (*)	0.2			■	■	■	■		■			■			■			■		■	■	■	■		0.35	2						■		
LK112	0.15			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		0.29	2						■		

\* All voltages from 1.3 to 5V with a 0.1V step, are available upon request

■ On request

## Dual and triple output linear voltage regulators

Family	$I_o$ max [A]	Output 1							$V_d$ [V]	$T_{ol}$ [%]	$I_o$ max [A]	Output 2						$V_d$ [V]	$T_{ol}$ [%]	Output 3			Packages										
		Output voltage [V]										Output voltage [V]								Output voltage [V]			PPAK	SPAK	DFN								
		1.5	1.8	2.5	2.6	2.8	3	3.3				1.5	1.8	2.5	2.8	3	3.3			Adj	8	$V_d$ [V]				$T_{ol}$ [%]							
ST2L05	1	■	■	■		■	■	■	2	1	■	■	■	■	■	■	1.25 to 3	1.1	3							■	■	■					
ST2L01								■	2	1							1.25 to 3	1.1	2							■	■						
LDRxxyy	0.5		■	■				■	5	1		■	■		■			0.45	5							■	■						
ST3L01	1.2				■			■	1	1								1.1	2					0.2		■						■	

■ On request

## Application specific linear voltage regulators

Part number	Description	$V_{in}$ [V]			$V_{out}$ [V]			$V_d$ [mV]	$I_o$ [max] [A]	$T_{op}$ [°C]		Short circuit protection	Thermal shutdown	Disable pin	Package
		Min	Typ	Max	Min	Typ	Max			Min	Max				
LNBK10SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK11SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK12SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK13SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK14SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK15SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK16SP	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-10	
LNBK20D2	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		SO-20	
LNBK20PD	LNB supply and control voltage regulator (parallel interface)			27		13 to 18		0.4	-40	125	■	■		PowerSO-20	
LBNP10SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP11SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP12SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP13SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP14SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP15SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP16SP	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-10	
LBNP20PD	LNB supply and control voltage regulator (parallel interface)			25		13 to 18		0.5	-40	125	■	■		PowerSO-20	
PB137ACV	Positive voltage regulator for battery charger			40		13.7		1.5	0	150	■	■		TO-220	
ST1534LD	500mA smart LDO					3.3		0.55	0	85	■	■		SO-8	

## Step-up switching voltage regulators

Part number	Description	Topology	V <sub>in</sub> [V]		V <sub>out</sub> [V]			Adjustable	I <sub>o</sub> [max] [A]	I <sub>q</sub> [μA]	f [kHz] max	Efficiency [%]	Peak current limitation	Disable pin	T <sub>op</sub> [°C]		Package
			Min	Max	Min	Typ	Max								Min	Max	
L6920	0.5A step up converter	Step-up	0.6	5.5	2		5.2	■		11	1MHz		1A	■			TSSOP8
L6920DB	0.5A step up converter	Step-up	0.6	5.5	1.8		5.2	■		11	1MHz		0.8A	■			MSOP8
ST5R25M	Micropower VFM step-up DC/DC converter	Step-up	1.2	5.5		2.5		0.1			150	87			-25	85	SOT23-5L
ST5R28M	Micropower VFM step-up DC/DC converter	Step-up	1.2	5.5		2.8		0.1			150	87			-25	85	SOT23-5L
ST5R30M	Micropower VFM step-up DC/DC converter	Step-up	1.2	5.5		3		0.1			150	87			-25	85	SOT23-5L
ST5R30U	Micropower VFM step-up DC/DC converter	Step-up	1.2	5.5		3		0.1			150	87			-25	85	SOT-89
ST5R33M	Micropower VFM step-up DC/DC converter	Step-up	1.2	5.5		3.3		0.1			150	87			-25	85	SOT23-5L
ST5R50M	Micropower VFM step-up DC/DC converter	Step-up	1.2	5.5		5		0.1			150	87			-25	85	SOT23-5L

## Step-down switching voltage regulators

Part number	Description	Topology	V <sub>in</sub> [V]		V <sub>out</sub> [V]			Adjustable	I <sub>q</sub> [μA]	f [kHz] max	Peak current limitation [A]	Disable pin	T <sub>op</sub> [°C]		Package
			Min	Max	Min	Typ	Max						Min	Max	
L6925D	Up to 0.8A high efficiency synchronous regulator	Step-down	2.7	5.5	0.6		5.5	■	25	600. synch up to 1400	1.2				MSOP8
L6926	Up to 0.8A high efficiency synchronous regulator	Step-down	2	5.5	0.6		5.5	■	25	600. synch up to 1400	1.2	■			MSOP8
L6926D	Up to 0.8A high efficiency synchronous regulator	Step-down	2	5.5	0.6		5.5	■	25	600. synch up to 1400	1.2	■			VFSON8
L6928D	Up to 0.8A high efficiency synchronous regulator	Step-down	2	5.5	0.6		5.5	■	25	1400. synch up to 2000	1.2	■			MSOP8
L6902	1A switching regulator	Step-down	8	36	1.23		35	■	3000	250	2.5				SO-8
L5970	1A switching regulator	Step-down	4.4	36	0.5		35	■	2500	250. synch up to 700	1.87	■			SO-8
L5970A	1A switching regulator	Step-down	4.4	36	0.5		35	■	2500	500. synch up to 700	1.87	■			SO-8

## Step-down switching voltage regulators cont'd.

Part number	Description	Topology	V <sub>in</sub> [V]		V <sub>out</sub> [V]			Adjustable	I <sub>a</sub> [μA]	f [kHz] max	Peak current limitation [A]	Disable pin	T <sub>op</sub> [°C]		Package
			Min	Max	Min	Typ	Max						Min	Max	
L5972	1.5A switching regulator	Step-down	4.4	36	1.23		35	■	2500	250. synch up to 700	2.5				SO-8
L5973A	1.5A switching regulator	Step-down	4.4	36	0.5		35	■	2500	500. synch up to 700	2.3	■			PowerSO-8
L5973	2A step down switching regulator	Step-down	4.4	36	0.5		35	■	2500	250. synch up to 700	3	■			PowerSO-8
L296	4A switching regulator	Step-down	9	46	5.1		40	■	30000	Up to 200	4.5	■			MW15
L4960	2.5A switching regulator	Step-down	9	46	5.1		40	■	15000	Up to 200	3				HW7
L4962	1.5A switching regulator	Step-down	9	46	5.1		40	■	15000	Up to 200	2	■			HW7, PDIP16
L4963	1.5A switching regulator	Step-down	9	46	5.1		40	■	15000	Free running	3.5				PDIP18, SO-20
L4970	10A switching regulator	Step-down	12	50	5.1		50	■	13000	Up to 500	13				MW15
L4971	1.5A switching regulator	Step-down	8	55	3.3		50	■	2500	Up to 300	2.5	■			DIP8, SO-16W
L4972	2A switching regulator	Step-down	12	50	5.1		40	■	13000	Up to 200	2.8				PDIP20, SO-20
L4973	3.5A switching regulator	Step-down	8	55	0.5		50	■	2700	Up to 300	4.5	■			PDIP18, SO-20
L4974A	3.5A switching regulator	Step-down	12	50	5.1		40	■	13000	Up to 200	4.75				MW15
L4975A	5A switching regulator	Step-down	12	50	5.1		40	■	13000	Up to 500	6.5				MW15
L4976	1A switching regulator	Step-down	8	55	0.5		50	■	2500	Up to 300	2	■			DIP8, SO-16W
L4977	7A switching regulator	Step-down	12	50	5.1		40	■	13000	Up to 500	9.5				MW15
L4978	2A switching regulator	Step-down	8	55	3.3		50	■	2500	Up to 300	3	■			DIP8, SO-16W
ST730ACD	5V DC-DC converter current mode PWM regulator	Step-down	4	11		5			800	200	2	■	0	70	SO-8
ST750ACD	Adjustable DC-DC converter current mode PWM regulator	Step-down	4	11		1.25 - V <sub>in</sub>		■	800	200	2	■	0	70	SO-8
ST763ABD	3.3V current mode PWM DC-DC converters	Step-down	3.3	11		3.3			600	200	2	■	-40	85	SO-8
ST763ABN	3.3V current mode PWM DC-DC converters	Step-down	3.3	11		3.3			600	200	2	■	-40	85	DIP-8
ST763ACD	3.3V current mode PWM DC-DC converters	Step-down	3.3	11		3.3			600	200	2	■	0	70	SO-8
ST763ACN	3.3V current mode PWM DC-DC converters	Step-down	3.3	11		3.3			600	200	2	■	0	70	DIP-8
ST1S03PMR	Adjustable step-down DC-DC converter		3	16		0.8 - 0.87 V <sub>in</sub>		■	2500	1500	1.65				DFN6 (3x3mm)



## Inverting switching voltage regulators

Part number	Description	Topology	V <sub>in</sub> [V]		V <sub>out</sub> [V] typ	Adjustable	I <sub>o</sub> [μA]	f [kHz] max	Peak Current limitation [A]	Disable pin	T <sub>op</sub> [°C]		Package
			Min	Max							Min	Max	
ST735CD	-5V inverting negative output current mode PWM regulator	Inverter	4	6.2	-5		800	160	2	■	-40	125	SO-8
ST735SCD	300kHz -5V inverting negative output current mode PWM regulator	Inverter	4	6.2	-5		800	300	2	■	-40	125	SO-8
ST735TCD	300kHz ADJ inverting negative output current mode PWM regulator	Inverter	3.5	9	-9 to -3.5	■	800	300	2	■	-40	125	SO-8
ST755CD	ADJ inverting negative output current mode PWM regulator	Inverter	4	11	-8.7 to -1.7	■	1200	160	2	■	-40	85	SO-8
ST755CN	ADJ inverting negative output current mode PWM regulator	Inverter	4	11	-8.7 to -1.7	■	1200	160	2	■	-40	85	DIP-8

## Multifunction: step-up-down inverting switching voltage regulators

Part number	Description	Topology	V <sub>in</sub> [V]		V <sub>out</sub> [V]* typ	Adjustable	I <sub>o</sub> [μA]	f [kHz] max	Peak current limitation [A]	Disable pin	T <sub>op</sub> [°C]		Package
			Min	Max							Min	Max	
MC34063ABD	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	2.5	33	1.5		-40	85	SO-8
MC34063ABN	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	2.5	33	1.5		-40	85	DIP-8
MC34063ACD	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	2.5	33	1.5		0	70	SO-8
MC34063ACN	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	2.5	33	1.5		0	70	DIP-8
MC34063EBD	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	1.5	33	1.5		-40	125	SO-8
MC34063EBN	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	1.5	33	1.5		-40	125	DIP-8
MC34063ECD	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	1.5	33	1.5		0	70	SO-8
MC34063ECN	DC-DC converter control circuits	Step-up-down		50	1.25 to 38	■	1.5	33	1.5		0	70	DIP-8

\* Only non inverting version

## Application specific switching voltage regulators

Part number	Description	$V_{in}$ [V]		$V_{out}$ [V] typ.		f [kHz]	$I_o$ max [A]	$T_{op}$ [°C]		Efficiency [%]	Disable pin	Package
		Min	Max	Min	Max			Min	Max			
LNBEH21PD	LNB supply and control IC with step-up converter and I <sup>2</sup> C interface. Semi low drop out control voltage regulators	8	15	13	18	220	0.45 to 0.75	-40	125	>90	I <sup>2</sup> C	PowerSO-20
LNBH21PD	LNB supply and control IC with step-up converter and I <sup>2</sup> C interface. Semi low drop out control voltage regulators	8	15	13	18	220	0.45 to 0.75	-40	125	>90	I <sup>2</sup> C	PowerSO-20
LNBH221PD	Double lnb supply and control IC with step-up converter and I <sup>2</sup> C interface. Semi low drop out control voltage regulators	8	15	13	18	220	0.5	-40	125	>90	I <sup>2</sup> C	PowerSO-36
LNBP21D2	LNBP supply and control IC with step-up converter and I <sup>2</sup> C interface	8	15	13	18	220	0.4 to 0.5	-40	125	>90	I <sup>2</sup> C	SO-20
LNBP21PD	LNBP supply and control IC with step-up converter and I <sup>2</sup> C interface	8	15	13	18	220	0.4 to 0.5	-40	125	>90	I <sup>2</sup> C	PowerSO-20
LNBS21PD	LNBP supply and control IC with step-up converter and I <sup>2</sup> C interface	8	15	13	18	220	0.4 to 0.5	-40	125	>90	I <sup>2</sup> C	PowerSO-20
ST3M01D	Switching & dual outs linear voltage regulators	1.9	3.3	1.9 - 3	3.3		0.02 to 0.02 to 0.2	-40	85	87	■	SO-14
ST3S01PHD	Battery charger IC		16				I <sub>supply</sub> (max)	-40	125			PowerSO-8
ST619LBD	DC-DC converter regulated 5V charge pump	2	5.5		5	500	0.12	-40	85	85	■	SO-8
ST619LBN	DC-DC converter regulated 5V charge pump	2	5.5		5	500	0.12	-40	85	85	■	DIP-8
ST662ABD	DC-DC converter from 5V to 12V. 0.03A for flash memory programming supply		6	5	12	400	0.05	-40	85	72	■	SO-8
ST662ABN	DC-DC converter from 5V to 12V. 0.03A for flash memory programming supply		6	5	12	400	0.05	-40	85	72	■	DIP-8
ST662ACD	DC-DC converter from 5V to 12V. 0.03A for flash memory programming supply		6	5	12	400	0.05	0	70	72	■	SO-8
ST662ACN	DC-DC converter from 5V to 12V. 0.03A for flash memory programming supply		6	5	12	400	0.05	0	70	72	■	DIP-8
STLC1PD	LED lamps cluster driver		24				7	-40	125		■	PowerSO-20

## PFC controllers

Part number	Description	V <sub>DD</sub> [V]			I <sub>CC</sub> [A]	Universal input mains	Protection option type	Topology mode	Fsw max	Package
		Min	Nom	Max	nom					
L4981A	Average current mode			19.5	1.6	■	Over current, overvoltage	PWM	200	DIP-20, SO-20
L4981B	Average current mode			19.5	1.6	■	Over current, overvoltage	PWM	200	DIP-20, SO-20
L6561	Transition mode	11		18	4	■	Over current, overvoltage	Transition		DIP-8, SO-8
L6562	Transition mode	10.3	12	22	3.5	■	Overvoltage protection	Transition mode		SO-8, DIP-8
L6563	Advanced transition mode PFC Controller	10.3	12	22	5.5	■	Overvoltage	Transition mode		SO-14

## Current mode PWM controllers

Part number	Description	V <sub>DD</sub> [V]		Max [A] nom	Fsw [kHz] max	Max duty cycle [%] typ	Current limiting mode	Disable pin	Standby pin	Package
		Min	Max							
L5991	Current mode PWM	12	20	1.5	100	93	Pulse, hiccup	■	■	DIP-16, SO-16
L6668	Smart primary controller	9.4	22	0.8	105	75	Peak current mode	■	■	SO-16
UC2842B	Current mode PWM	11	30	1	500	100	Pulse			SO-8, DIP-8
UC2843B	Current mode PWM	8.2	30	1	500	100	Pulse			SO-8, DIP-8
UC2844B	Current mode PWM	11	30	1	500	50	Pulse			SO-8, DIP-8
UC2845B	Current mode PWM	8.2	30	1	500	50	Pulse			SO-8, DIP-8
UC3842B	Current mode PWM	11	30	1	500	100	Pulse			SO-8, DIP-8
UC3843B	Current mode PWM	8.2	30	1	500	100	Pulse			SO-8, DIP-8
UC3844B	Current mode PWM	11	30	1	500	50	Pulse			SO-8, DIP-8
UC3845B	Current mode PWM	8.2	30	1	500	50	Pulse			SO-8, DIP-8

## Resonant controllers

Part number	Description	$V_{DD}$ [V]		Max [A] nom	Topology	Current limiting mode	Disable pin	Standby pin	Package
		Min	Max						
L6565	Resonant controller	10.3	18	0.4	Quasi resonant	Pulse, hiccup	■		SO-8, DIP-8
L6598	Resonant controller	10.3	18	0.45	Resonant	Pulse, hiccup	■		SO-16, DIP-16

## Voltage mode PWM controllers

Part number	Description	$V_{DD}$ [V]		Max [A] nom	Fsw [kHz] max	Max duty cycle [%]	Topology	Current limiting mode	Disable pin	Standby pin	Package
		Min	Max								
SG3524	Voltage mode PWM	8	40	0.1	300	45	Voltage mode	Pulse		■	SO-16, DIP-16
SG2525	Voltage mode PWM	8	35	0.5	500	49	Voltage mode	Pulse	■	■	SO-16, DIP-16
SG3525	Voltage mode PWM	8	35	0.5	500	49	Voltage mode	Pulse	■	■	SO-16, DIP-16

## Offline converters

Part number	Description	$V_{CC}$ [V]		BvDSS [V]	$R_{DS(on)}$ [ $\Omega$ ]		$I_o$ [A]	Fsw [kHz]	Switching frequency mode	Max duty cycle typ	Topology	Current limiting mode	Standby pin	Package
		Min	Max		min	max								
L6590L	Off-line switching converter	7	16.5	700	16	0.55	65	Internally fixed	70	Buck, buck-boost, fly-back	Pulse	Frequency reduction	DIP-8	
L6590D	Off-line switching converter	7	16.5	700	16	0.55	65	Internally fixed	70	Buck, buck-boost, fly-back	Pulse	Frequency reduction	SO-16	
L6590AN	Off-line switching converter	7.5	15.5	700	16	0.55	65	Internally fixed	70	Buck, buck-boost, fly-back	Pulse	Frequency reduction	DIP-8	
VIPer12AS	SMPS primary I.C.	9	38	730	30	0.32	60	Internally fixed	90	Buck, buck-boost, fly-back	Pulse	Burst mode	SO-8	
VIPer12ADIP	SMPS primary I.C.	9	38	730	30	0.32	60	Internally fixed	90	Buck, buck-boost, fly-back	Pulse	Burst mode	DIP-8	

## Offline converters cont'd.

Part number	Description	V <sub>CC</sub> [V]		B <sub>VDS</sub> [V]	R <sub>DS(on)</sub> [Ω]	I <sub>o</sub> [A]	F <sub>sw</sub> [kHz]	Switching frequency mode	Max duty cycle typ	Topology	Current limiting mode	Standby pin	Package
		Min	Max	Min	Max	Min	Typ						
VIPer22AS	SMPS primary I.C.	9	38	730	30	0.56	60	Internally fixed	90	Buck, buck-boost, fly-back	Pulse	Burst mode	SO-8
VIPer22ADIP	SMPS primary I.C.	9	38	730	30	0.56	60	Internally fixed	90	Buck, buck-boost, fly-back	Pulse	Burst mode	DIP-8
VIPer20	SMPS primary I.C.	9	15	620	16	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer20(022Y)	SMPS primary I.C.	9	15	620	16	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer20DIP	SMPS primary I.C.	9	15	620	16	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	DIP-8
VIPer20A	SMPS primary I.C.	9	15	700	18	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer20A(022Y)	SMPS primary I.C.	9	15	700	18	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer20ADIP	SMPS primary I.C.	9	15	700	18	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	DIP-8
VIPer20ASP	SMPS primary I.C.	9	15	700	18	0.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PowerSO-10
VIPer50	SMPS primary I.C.	9	15	620	5	1.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer50(022Y)	SMPS primary I.C.	9	15	620	5	1.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer50A	SMPS primary I.C.	9	15	700	5.7	1.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer50A(022Y)	SMPS primary I.C.	9	15	700	5.7	1.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer50ASP	SMPS primary I.C.	9	15	700	5.7	1.5		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PowerSO-10
VIPer53DIP	Offline primary switch	9.3	17	620	1	1.6		Externally settable up to 300kHz	90	Buck, buck-boost, Fly-back		Burst mode	DIP-8
VIPer53SP	Offline primary switch	9.3	17	620	1	1.6		Externally settable up to 300kHz	90	Buck, buck-boost, fly-back		Burst mode	PowerSO-10
VIPer53EDIP	Offline primary switch	9.3	17	620	1	1.6		Externally settable up to 300kHz	90	Buck, buck-boost, fly-back		Burst mode	DIP-8
VIPer53ESP	Offline primary switch	9.3	17	620	1	1.6		Externally settable up to 300kHz	90	Buck, buck-boost, fly-back		Burst mode	PowerSO-10
VIPer100	SMPS primary I.C.	9	15	700	2.5	3		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer100(022Y)	SMPS primary I.C.	9	15	700	2.5	3		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer100A	SMPS primary I.C.	9	15	700	2.8	3		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer100A(022Y)	SMPS primary I.C.	9	15	700	2.8	3		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PENTAWATT H.V.
VIPer100ASP	SMPS primary I.C.	9	15	700	2.8	3		Externally settable up to 200kHz	90	Buck, buck-boost, fly-back	Pulse	Burst mode	PowerSO-10

## Voltage references

### Micropower

Part number	Description	Technology	Precision [%]	Cathode to anode voltage [V]		Reference voltage $V_{ref}$ [V]	Temp. coef. of $V_{ref}$ $T_C$ max [°C]	Operating cathode current [mA]		Static impedance $R_{ka}$ max [Ω]	Line regulation max [mV]	Load regulation max [mV]	Quiescent current typ [mA]
				$V_{ka}$ min	$V_{ka}$ max			$I_K$ min	$I_K$ max				
TS4040-2.5	2.5V micropower shunt voltage reference	BiCMOS	2 - 1			2.5	150	0.065	15	0.6			
TS4041-1.2	1.225V micropower shunt voltage reference	BiCMOS	2 - 1 - 0.5			1.225	150	0.065	12	0.5			
TS431	Low voltage adjustable shunt reference	BiCMOS	2 - 1 - 0.5	1.24	6	1.24	100	0.06	30	0.4			
TS432	1.24V adjustable shunt voltage reference	BiCMOS	1 - 0.5	1.24	10	1.24	100	0.06	12	0.5			
TS821	1.225V micropower shunt voltage reference	BiCMOS	2 - 1 - 0.5			1.225	120	0.045	12	0.5			
TS822	2.5V micropower shunt voltage reference	BiCMOS	2 - 1			2.5	100	0.05	15	0.6			
TS824-1.2	High thermal stability micropower shunt voltage reference	BiCMOS	1			1.225	50	0.05	12	0.7			
TS824-2.5	High thermal stability micropower shunt voltage reference	BiCMOS	1 - 0.5			2.5	50	0.06	15	0.6			

### General purpose

LM336	2.5V voltage reference	BIPOLAR	2 - 1			2.5		0.4	10	1			
MC1403	2.5V precision serial voltage reference	BIPOLAR	1			2.5	40				4.5	10	1.2
TL1431	Programmable voltage reference	BIPOLAR	0.4 - 0.25	2.5	36	2.5	100	1	100	0.5			
TL431	Programmable voltage reference	BIPOLAR	2 - 1	2.5	36	2.5	100	1	100	0.5			
TS2431	Programmable shunt voltage reference	BiCMOS	2 - 1 - 0.5	2.5	24	2.5	100	1	100	0.75			
TS3431	Programmable shunt voltage reference	BiCMOS	2 - 1 - 0.5	1.24	24	1.24	100	0.5	100	0.4			
TS4431*	Programmable low voltage shunt regulator	BiCMOS	0.5	0.3	10	1.24	100	0	20		5	5	0.1

### Thermal sensors

LM334	Three terminal adjustable shunt current source	BIPOLAR	+ / - 6										
LM335	Precision shunt temperature sensor	BIPOLAR	+ / - 3										

\* Next releases



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