

# 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
LM <b>C</b> 38 <b>P</b>	LM <b>C</b> 37 <b>P</b>	L4941 <b>PS</b>	L4940 <b>PVVS</b>
LM <b>C</b> 50 <b>P</b>	L79 <b>VVTCPS</b>	LD1117 <b>PVVC</b> S	LD1580 <b>PVVS</b>
LM <b>C</b> 23 <b>P</b>	L79L <b>VVTCPS</b>	KD1083 <b>PVVS</b>	LD29080 <b>PVVS</b>
LM <b>C</b> 17 <b>PS</b>		LD1084 <b>PVVS</b>	LD29150 <b>PVVS</b>
LM <b>C</b> 17 <b>MPS</b>		LD1085 <b>PVVS</b>	LD29300 <b>PVVS</b>
LM <b>C</b> 17L <b>PS</b>		LD1086 <b>PVVS</b>	LD2979 <b>PVVS</b>
LM723 <b>PS</b>		LD1117A <b>PVVS</b>	LD3985 <b>PVVS</b>
L78S <b>VVTC</b> P		LK112 <b>PVVS</b>	LK115 <b>PVV</b>
L78 <b>VVTC</b> PS		LK112S <b>PVVS</b>	STC2 <b>PVVS</b>
L78M <b>VVTC</b> PS		KD1084 <b>TPVVS</b>	L4931 <b>TPVVS</b>
L78L <b>VVTC</b> PS		LD1585 <b>TPVVS</b>	L4987 <b>TPVVS</b>
			LD2980 <b>TPVVS</b>
			LD2981 <b>TPVVS</b>
			LD2982 <b>TPVVS</b>
			LD2985 <b>TPVVS</b>
			LM2931 <b>TPVVS</b>
			KF <b>VVTP</b> S
			LE <b>VVTP</b> S
			LF <b>VVTP</b> S

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
DPAK	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
Amopack	AP, -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				■			■		■		■			■	■			■		■	■	■			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																										0.25	4	■		■					■
LD1117A	1						■		■		■			■	■			■		■	■	■			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]	$T_{ol}$ [%]	$I_o$ max [A]	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		■	■	■		■	■	■	2	1	■	■	■	■	■	1.25 to 3	1.1	3									■	■	■
ST2L01	1							■	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			■	1.6	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>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	
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	-5 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] nom	Universal input mains	Protection option type	Topology mode	Fsw max	Package
		Min	Nom	Max						
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]	RDS(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>V</sub> DSS [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 [ $\Omega$ ]	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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