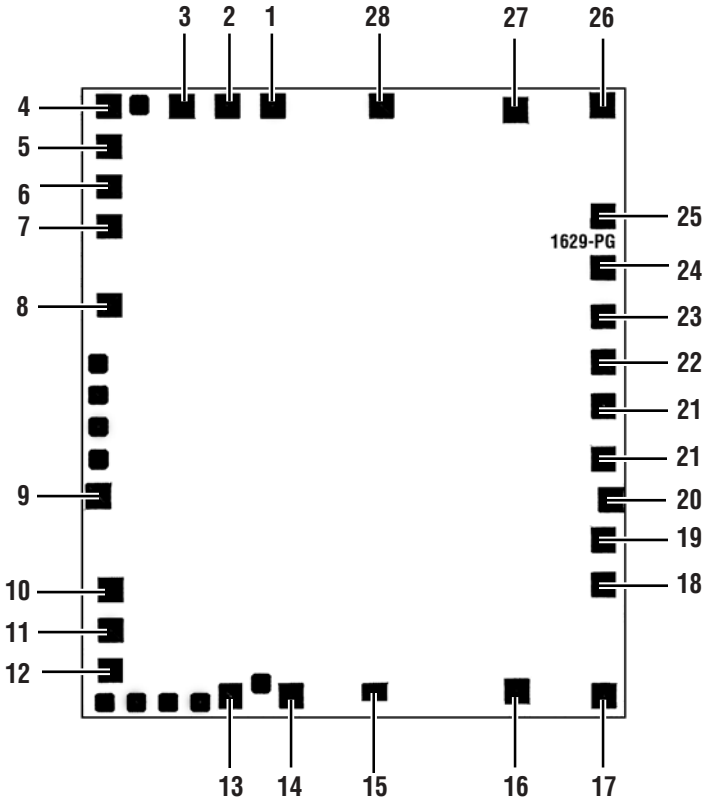
DICE/DWF SPECIFICATION

LTC1629-PG

Polyphase, High Efficiency, Synchronous Step-Down Switching Regulator



100 × 120 mils

DIE CROSS REFERENCE

LTC Finished Part Number	Order DICE CANDIDATE Part Number Below
LTC1629-PG	LTC1629-PG DICE
LTC1629-PG	LTC1629-PG DWF

PAD FUNCTION

1. RUN/SS
2. SENSE1$^+$
3. SENSE1$^-$
4. EAIN
5. PLLFLTR
6. PLLIN
7. PHASMD
8. I_{TH}
9. SGND
10. $V_{DIFFOUT}$
11. V_{OS}^-
12. V_{OS}^+
13. SENSE2$^-$
14. SENSE2$^+$
15. PGOOD
16. TG2
17. SW2
18. BOOST2
19. BG2
20. PGND
21. $INTV_{CC}$
22. $EXTV_{CC}$
23. BG1
24. V_{IN}
25. BOOST1
26. SW1
27. TG1
28. CLKOUT

DICE ELECTRICAL TEST LIMITS

T_A = 25°C. V_{IN} = 15V, $V_{RUN/SS}$ = 5V unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNITS
Main Control Loop					
V_{EAIN}	Regulated Feedback Voltage	(Note 1); I_{TH} Voltage = 1.2V	0.792	0.808	V
$V_{SENSEMAX}$	Maximum Current Sense Threshold	$V_{SENSE1,\ 2}$ = 5V;	65	85	mV
I_{INEAIN}	Feedback Current	(Note 1)		–50	nA
$V_{LOADREG}$	Output Voltage Load Regulation	(Note 1) Measured in Servo Loop; I_{TH} Voltage = 0.7V Measured in Servo Loop; I_{TH} Voltage = 2V		 0.5 –0.5	 % %
$V_{REFLNREG}$	Reference Voltage Line Regulation	V_{IN} = 3.6V to 30V (Note 1)		0.02	%/V
V_{OVL}	Output Overvoltage Threshold	Measured at V_{EAIN}	0.84	0.88	V
UVLO	Undervoltage Lockout	V_{IN} Ramping Down	3	4	V
I_Q	Input DC Supply Current Shutdown	(Note 4); $V_{RUN/SS}$ = 0V		40	μA
$I_{RUN/SS}$	Soft-Start Charge Current	$V_{RUN/SS}$ = 1.9V	–0.5		μA

DICE ELECTRICAL TEST LIMITS

T_A = 25°C. V_{IN} = 15V, $V_{RUN/SS}$ = 5V unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNITS
$V_{RUN/SS}$	RUN/SS Pin ON Threshold	$V_{RUN/SS}$ Rising	1.0	1.9	V
$V_{RUN/SSLO}$	RUN/SS Pin Latchoff Arming	$V_{RUN/SS}$ Rising from 3V		4.5	V
I_{SCL}	RUN/SS Discharge Current	Soft Short Condition V_{EAIN} = 0.5V; $V_{RUN/SS}$ = 4.5V	0.5	4	µA
I_{SDLDO}	Shutdown Latch Disable Current	V_{EAIN} = 0.5V		5	µA
I_{SENSE}	Total Sense Pins Source Current	Each Channel; $V_{SENSE1-,2-}$ = $V_{SENSE1+,2+}$ = 0V	–85		µA
DF_{MAX}	Maximum Duty Factor	In Dropout	98		%
	Top Gate Transition Time:				
TG1, 2 t_r	Rise Time	C_{LOAD} = 3300pF		90	ns
TG1, 2 t_f	Fall Time	C_{LOAD} = 3300pF		90	ns
	Bottom Gate Transition Time:				
BG1, 2 t_r	Rise Time	C_{LOAD} = 3300pF		90	ns
BG1, 2 t_f	Fall Time	C_{LOAD} = 3300pF		90	ns
Internal V_{CC} Regulator					
V_{INTVCC}	Internal V_{CC} Voltage	6V < V_{IN} < 30V; V_{EXTVCC} = 4V	4.8	5.2	V
V_{LDO} INT	$INTV_{CC}$ Load Regulation	I_{CC} = 0 to 20mA; V_{EXTVCC} = 4V		1.0	%
V_{LDO} EXT	$EXTV_{CC}$ Voltage Drop	I_{CC} = 20mA; V_{EXTVCC} = 5V;		240	mV
V_{EXTVCC}	$EXTV_{CC}$ Switchover Voltage	I_{CC} = 20mA, $EXTV_{CC}$ Ramping Positive	4.5		V
Oscillator and Phase-Locked Loop					
f_{NOM}	Nominal Frequency	$V_{PLLFLTR}$ = 1.2V	190	250	kHz
f_{LOW}	Lowest Frequency	$V_{PLLFLTR}$ = 0V	120	160	kHz
f_{HIGH}	Highest Frequency	$V_{PLLFLTR}$ ≥ 2.4V	280	360	kHz
R_{RELPHS}	Controller 2-Controller 1 Phase	V_{PHASMD} = 0V, Open V_{PHASMD} = 5V	180 240		Deg Deg
CLKOUT	Phase (Relative to Controller 1)	V_{PHASMD} = 0V V_{PHASMD} = Open V_{PHASMD} = 5V	60 90 120		Deg Deg Deg
CLK_{HIGH}	Clock High Output Voltage		4		V
CLK_{LOW}	Clock Low Output Voltage			0.2	V
Differential Amplifier/Op Amp Gain Block					
A_{DA}	Gain	Differential Amp Mode	0.995	1.005	V/V
$CMRR_{DA}$	Common Mode Rejection Ratio	Differential Amp Mode; 0V < V_{CM} < 5V	46		dB
PGOOD Output					
V_{PGL}	PGOOD Voltage Low	I_{PGOOD} = 2mA		0.3	V
I_{PGOOD}	PGOOD Leakage Current	V_{PGOOD} = 5V		±1	µA
V_{PG}	PGOOD Trip Level, Either Controller	V_{EAIN} with Respect to Set Output Voltage V_{EAIN} Ramping Negative V_{EAIN} Ramping Positive	 –6 6	 –9.5 9.5	 % %

Note 1: The LTC1629-PG is tested in a feedback loop that servos V_{ITH} to a specified voltage and measures the resultant V_{EAIN}.

Wafer level testing is performed per the indicated specifications for dice. Considerable differences in performance can often be observed for dice versus packaged units due to the influences of packaging and assembly on certain devices and/or parameters. Please consult factory for more information on dice performance and lot qualifications via lot sampling test procedures.

Dice data sheet subject to change. Please consult factory for current revision in production.

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