

GENERAL DESCRIPTION

The ACP3084 are constant frequency, current mode, PWM step down converters. The devices integrate a main switch and a synchronous rectifier for high efficiency. The 2.7V to 5.5V input voltage range makes the devices ideal for powering portable equipment that runs from a single cell Lithium-Ion (Li+) battery or 3-cells NiMH/ NiCd batteries. The output voltage can be regulated as low as 0.6V. The ACP3084 supports up to 3A load current and can also run at 100% duty cycle for low dropout applications, extending battery life in portable systems. Switching frequency is internally set at 1MHz, allowing the use of small surface mount inductors and capacitors. The devices are available in an TDFN3x3-10 package.

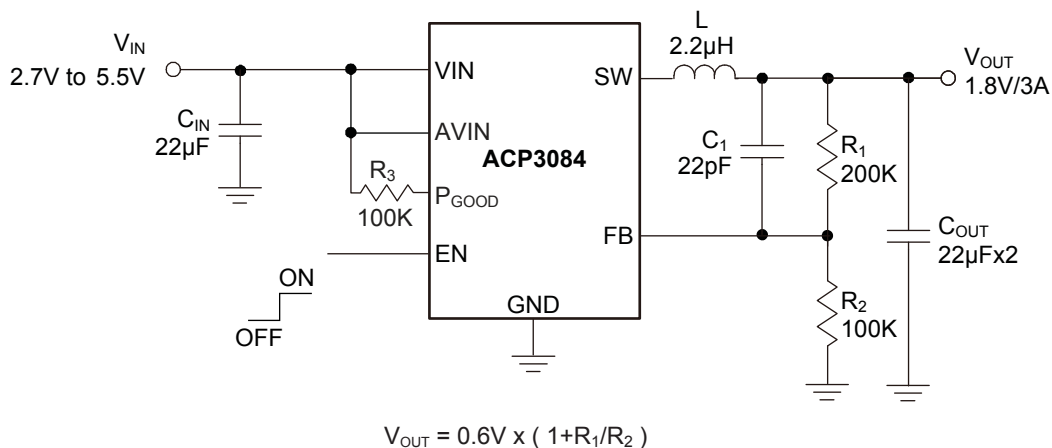
FEATURES

- Input Voltage Range: 2.7V to 5.5V
- High Efficiency up to 95%
- Low 100mΩ High Side R_{DS(ON)} Switches
- 3A Available Load Current
- 30μA Typical Quiescent Current
- 1MHz Constant Switching Frequency
- Adjustable Output Voltage as Low as 0.6V
- 100% Duty Cycle Low Dropout Operation
- Short Circuit and Thermal Protection
- Excellent Line and Load Transient Response
- Soft Start Function
- Power Good

APPLICATION

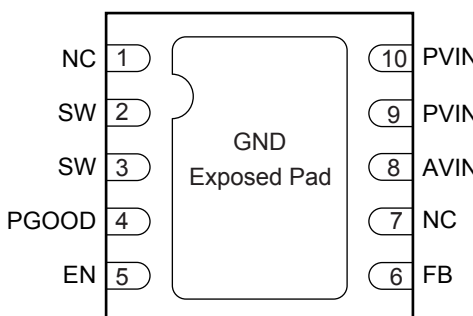
- Set Box
- Datacomm
- Portable Instruments

APPLICATION CIRCUIT



Typical ACP3084 Application Circuit

▼ PIN CONFIGURATION

Pin Configuration	Pin Description		
TDFN3x3-10	Pin#	Symbol	Function
<p>(Top View)</p> 	1	NC	No Internal Connect
	2	SW	Switch Node Connection to Inductor
	3	SW	Switch Node Connection to Inductor
	4	PGOOD	Power Good Output Pin
	5	EN	Chip Enable Pin
	6	FB	Feedback Pin
	7	NC	No Internal Connect
	8	AVIN	Analog Supply Voltage Pin
	9	PVIN	Power Supply Voltage Pin
	10	PVIN	Power Supply Voltage Pin
	PAD	GND	Exposed Pad Must Connected to GND

▼ ORDERING INFORMATION

Standard Part NO.	Package	Packing	Min. Quantity
ACP3084-VAB	TDFN3x3-10	Tape & Reel	2500PCS

▼ ABSOLUTE MAXIMUM RATINGS($T_A = +25^{\circ}\text{C}$)

Parameter	Symbol	Rating	Unit
Input Voltage	V_{IN}	-0.3 to 6	V
EN, FB, SW Voltages	V_{EN}, V_{FB}, V_{SW}	-0.3 to $V_{IN}+0.3$	
Junction Temperature	T_J	150	°C
Storage Temperature	T_S	-65 to 150	
Lead Temperature	T_L	260	
Junction to Ambient	θ_{JA}	69	°C/W

▼ RECOMMENDED OPERATING CONDITIONS

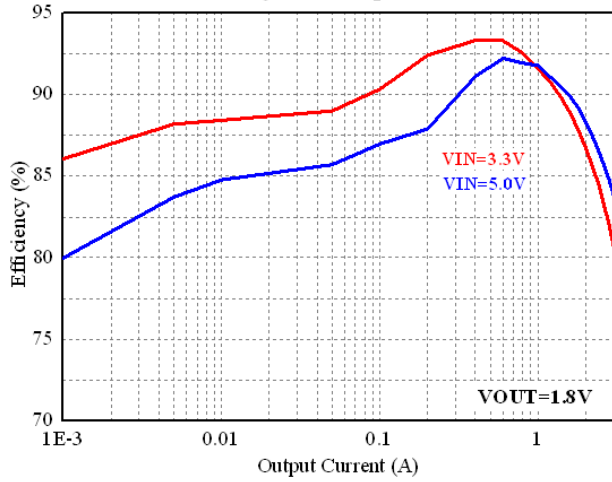
Parameter	Symbol	Rating	Unit
Supply Voltage	V_{IN}	2.7 to 5.5	V
Operating Ambient Temperature	T_A	-40 to 85	°C

▼ ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$)

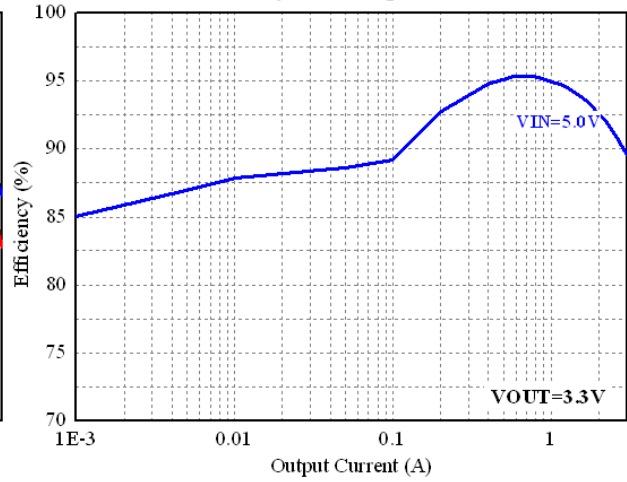
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Voltage Range	V _{IN}		2.7		5.5	V
V _{IN} Under Voltage Lockout Threshold	V _{UVLO}	V _{IN} Rising		2.35	2.5	V
		V _{IN} Falling	2	2.15		
Quiescent Current	I _Q	V _{FB} =105%*V _{REF} , SW Open		30		μA
Shutdown Current	I _{SHDN}	V _{EN} =0V			1	
EN Threshold	V _{ENH}	On State			1.5	V
	V _{ENL}	Off State	0.3			
Regulated Feedback Voltage	V _{FB}		0.588	0.6	0.612	
PMOS on Resistance	R _{PMOS}	I _{SW} =200mA		100		mΩ
NMOS on Resistance	R _{NMOS}	I _{SW} =-200mA		60		
Oscillator Frequency	F _{OSC}	V _{FB} =0.6V	0.8	1	1.2	MHz
		V _{FB} =0V		354		KHz
Peak Inductor Current	I _{PK}	V _{IN} =5V, V _{FB} =90%*V _{REF}		5		A
Output Discharge Switch on Resistance	R _{DSCH}			45		Ω
Thermal Shutdown Threshold	T _{SD}			160		°C
Thermal Shutdown Hysteresis	T _{Hys}			30		
Soft Start Time	T _{SS}			1.5		ms
PGOOD High Threshold	V _{PGHR}	FB rising, PG High to Low		110		%
	V _{PGHF}	FB falling, PG Low to High		103		
PGOOD Low Threshold	V _{PGLR}	FB rising, PG Low to High		90		
	V _{PGLF}	FB falling, PG High to Low		85		
PGOOD Open-Drain Impedance (PGOOD=low)	R _{PG}			35		Ω

PERFORMANCE CHARACTERISTIC

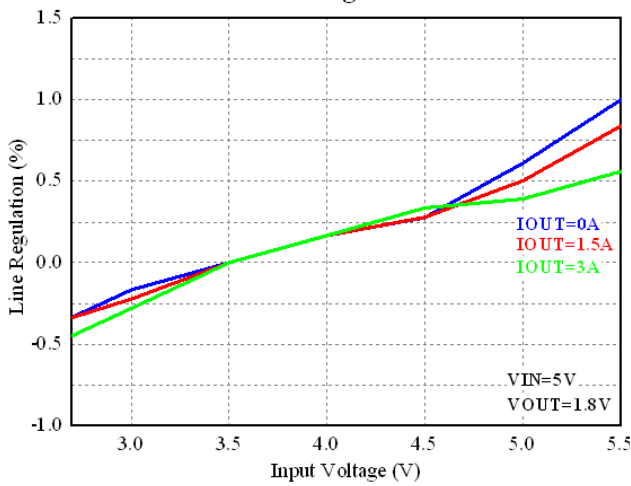
Efficiency vs. Output Current



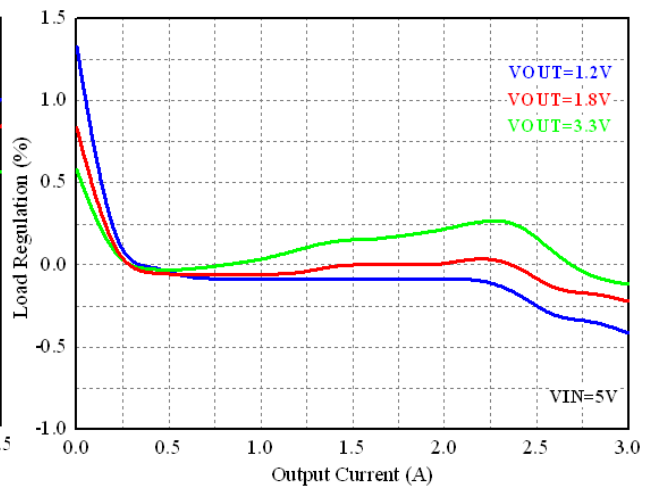
Efficiency vs. Output Current



Line Regulation

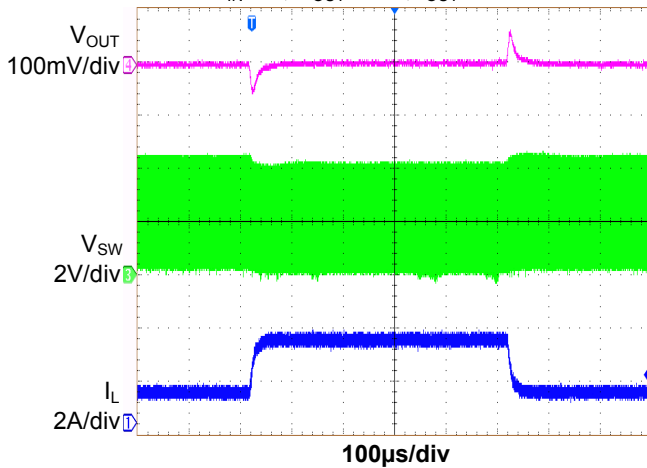


Load Regulation

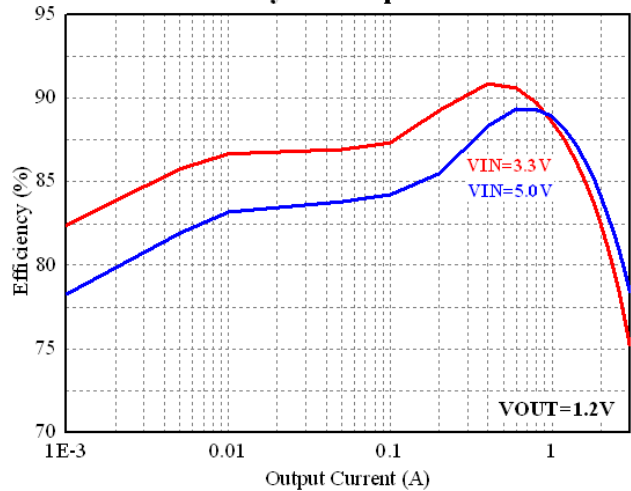


Load Transient Response

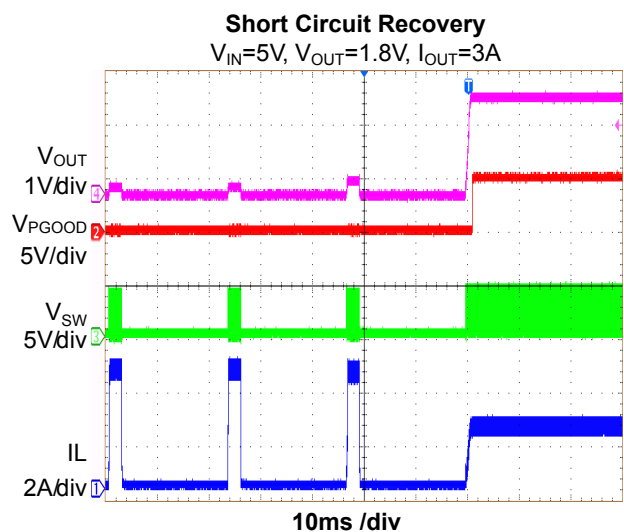
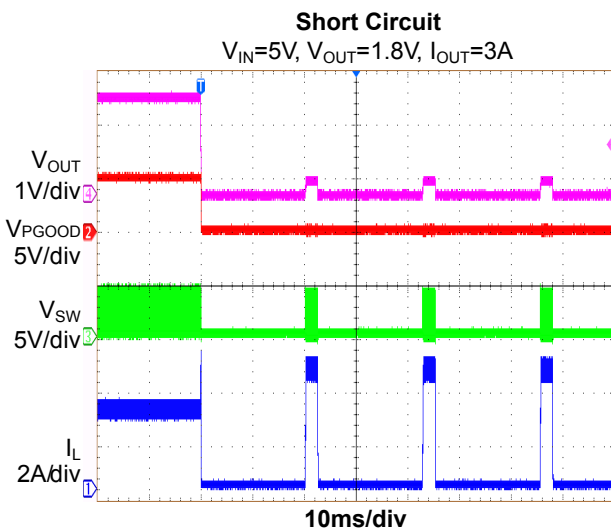
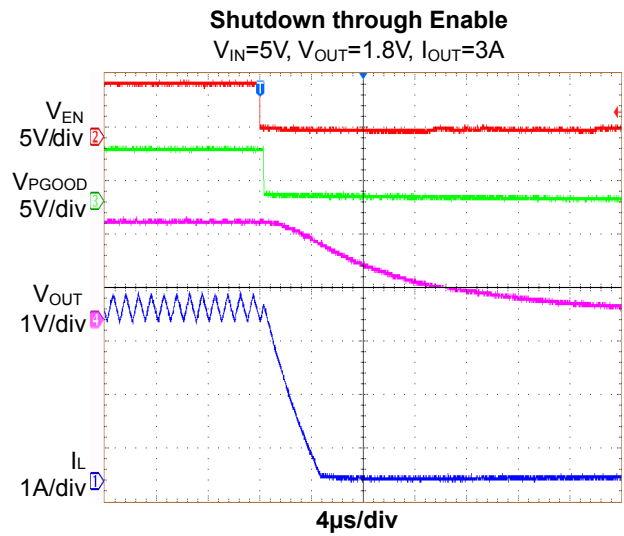
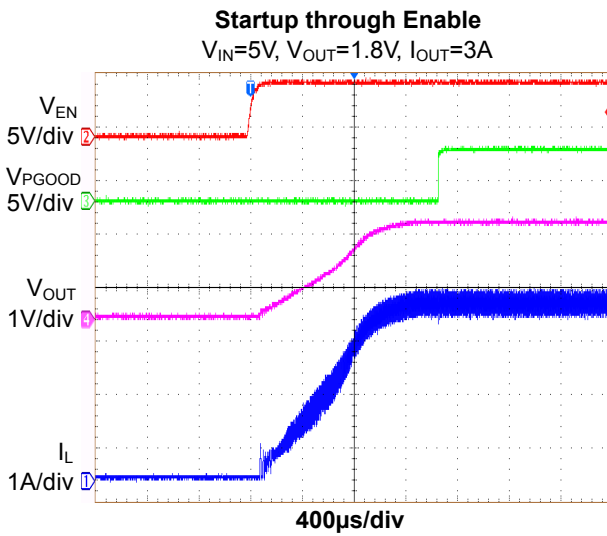
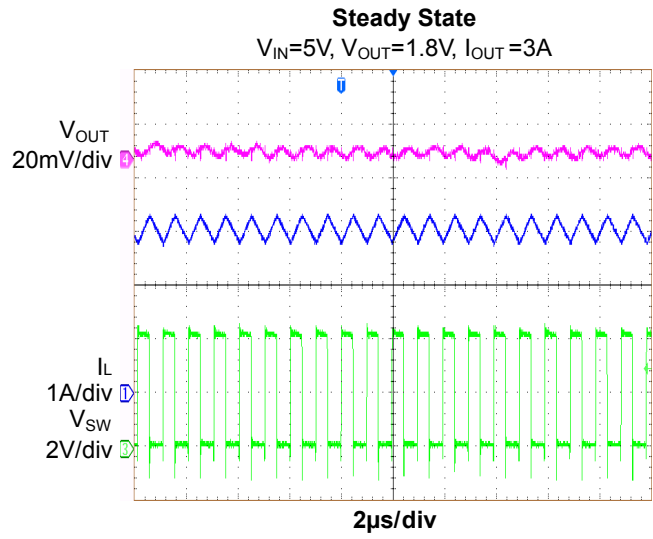
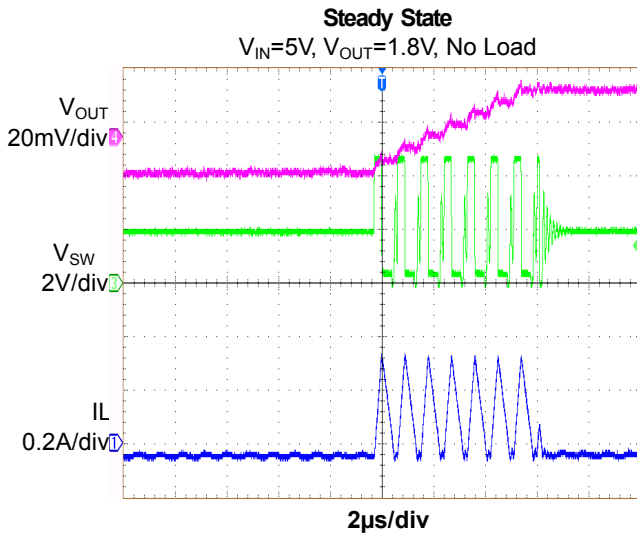
$V_{IN}=5V, V_{OUT}=1.8V, I_{OUT}=1A \text{ to } 3A$



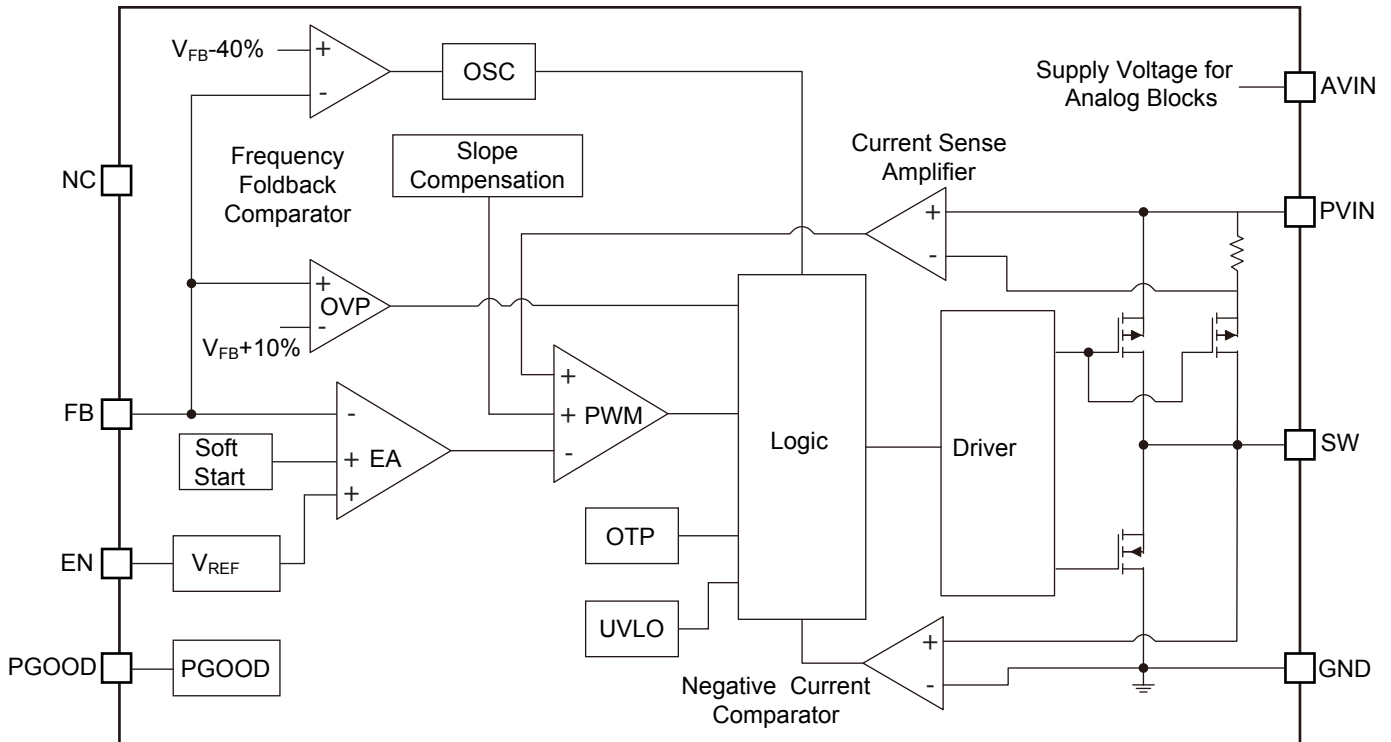
Efficiency vs. Output Current



PERFORMANCE CHARACTERISTIC (Continued)

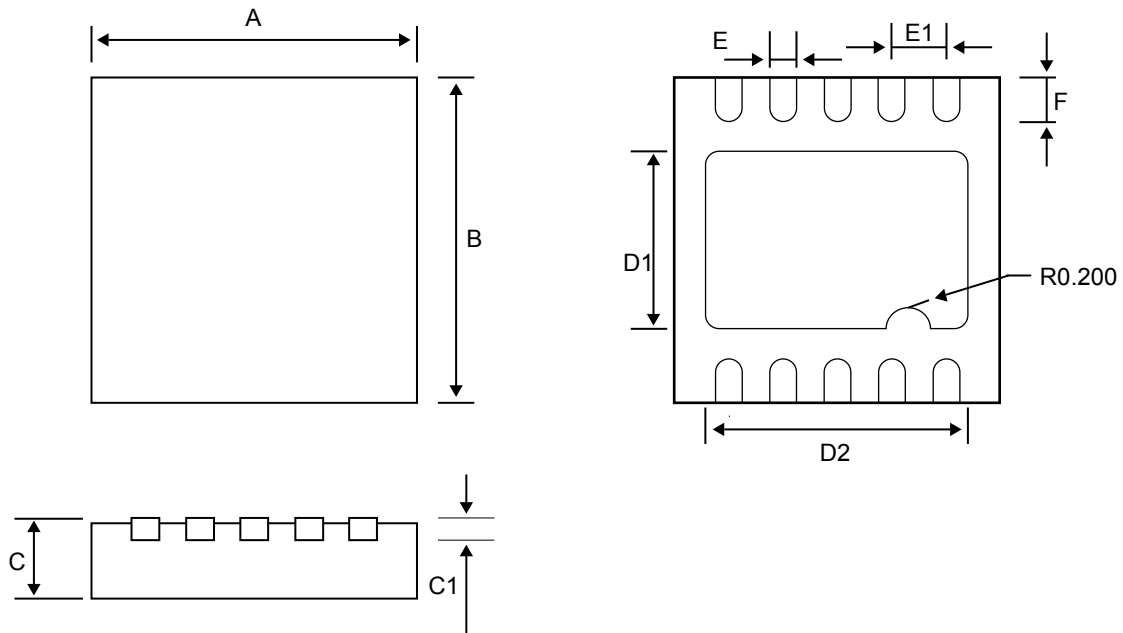


FUNCTION BLOCK



PACKAGE INFORMATION

- TDFN3X3-10



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.900	3.100	0.114	0.122
B	2.900	3.100	0.114	0.122
C	0.700	0.800	0.027	0.035
C1		0.005		
D1		2.400		0.088
D2		1.750	0.000	0.068
E	0.180	0.300	0.007	0.018
E1		0.500		0.019
F	0.450	0.650	0.017	0.025