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The SCT22C1C adopts a Constant On-Time (COT) control to provide fast transient response and easy loop stabilization. The device offers fixed 1ms soft start to prevent inrush current during the startup of output voltage ramping. Power Good with open drain output signals that the output voltage is within regulation.

The SCT22C1C has the MODE pin to select Pulse Frequency Modulation (PFM) operation mode to achieve the light load power save, or Ultrasonic Mode (USM) to keep the switching frequency above audible frequency areas during light-load or no-load conditions, or Forced Continuous Conduction Mode (FCCM) to achieve the small output ripple.

%

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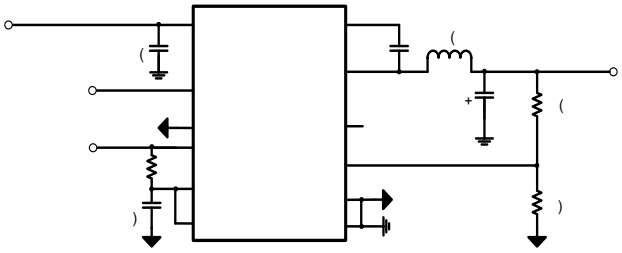
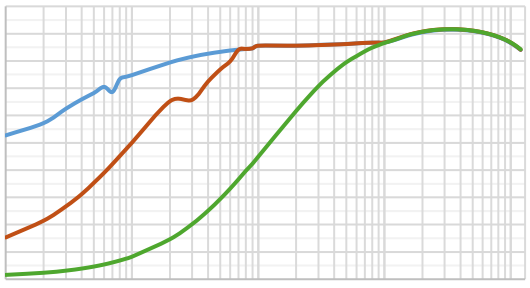


2.9V-18V, Synchronous Buck Converter



Vin=12V, Vout=1.2V, fsw=400kHz

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(% %
(% & %

ORDERABLE DEVICE	PACKAGING TYPE	STANDARD PACK QTY	PACKAGE MARKING	PINS	PACKAGE DESCRIPTION	MSL
)) (	□	,	) (	()	) ()	(

(

DESCRIPTION	MIN	MAX	UNIT
	%	(	
	%	"-	
	(	" %	
	%	-	
	%	-	
	%	-	
	%	-	
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	-,	(,	

Figure 1. 12-Lead Plastic QFN
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% (,

NAME	NO.	PIN FUNCTION
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	)	% %
		% , (, %
	+	%
	,	% (+ %

	-	% % % %
	.	% % % % %
	/	% % %
		% % % % (%
	(	% %
	((	Feedback voltage Input. Connect FB to the tap of a resistor divider from output voltage to AGND to set up output voltage. The device regulates FB to the internal reference value of 0.6V typical.
	()	% % % % (% %

PARAMETER	DEFINITION	MIN	MAX	UNIT
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		%	)	
		+	( ) ,	

PARAMETER	DEFINITION	MIN	MAX	UNIT
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	)) (+ (	%	" %	

((, , , %)
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PARAMETER	THERMAL METRIC	QFN-12L	UNIT
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	(	) %	
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	)	/ %	
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SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Supply and Output						
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			) %	) %	) %)	
				(	,	
		) , % %		(, ,	),	
			+%	+%	,	
		,			%	
Reference and Control Loop						
		) % (/),	% +	%	% -	
		(%			(,	
Power MOSFETs						
		,		(,		
		,		,		
Enable and Soft-start						
			(% (%, (% (%			
		(	(	(%	)	
		(		(	)	
Operation Mode						
		,	+%,			
			(%		%	
					(	
Switching Frequency						
			+	+	+-	
				-		
				()		
Power Good						
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				/ ,		
				((,		
				(,		
				%		
		+		%		
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SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Protection						
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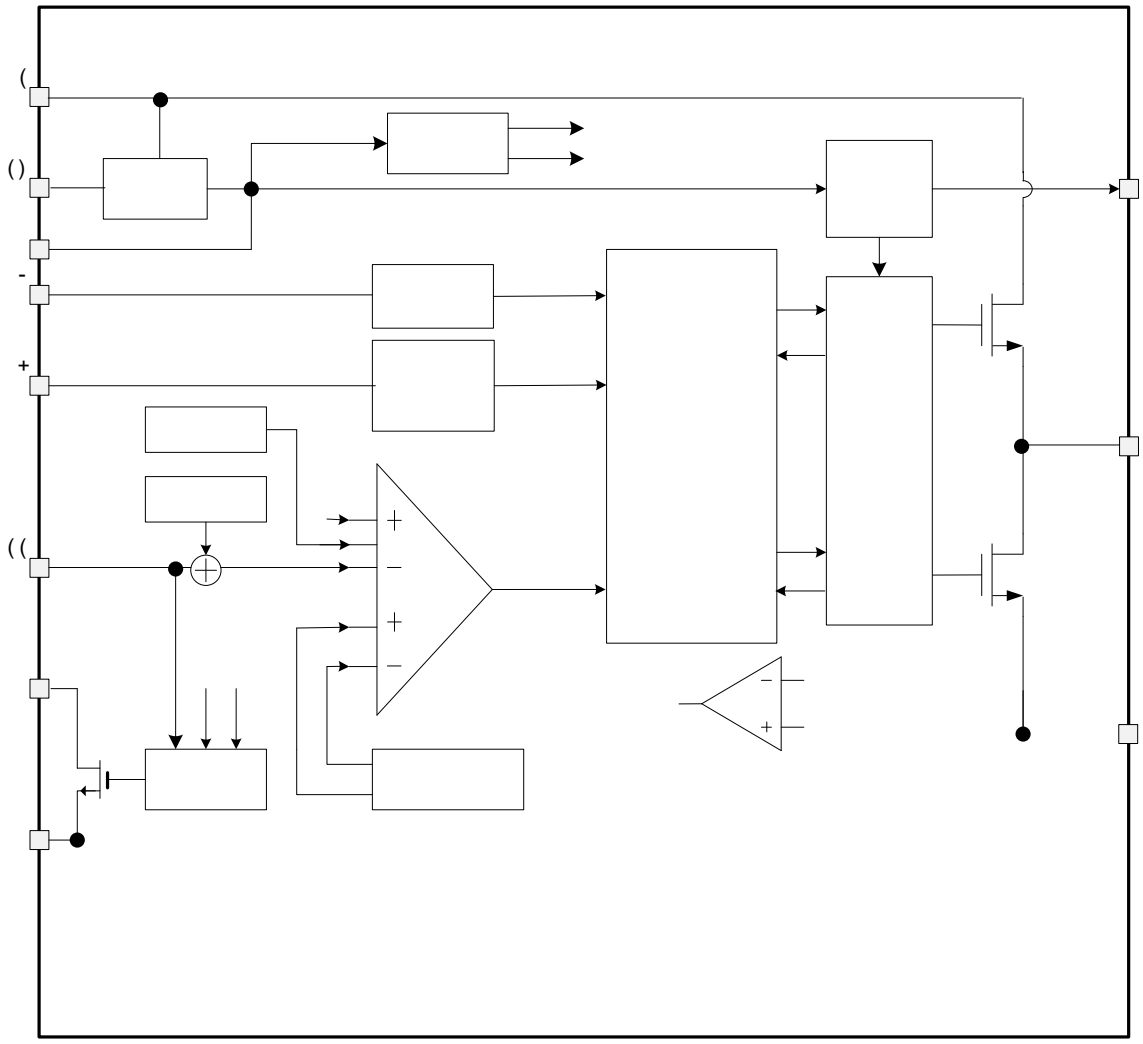

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Overview

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Constant on-time (COT) Mode Control

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(

% % %

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Pulse Frequency Modulation (PFM) and Ultra-sonic Modulation (USM) Modes

)) (

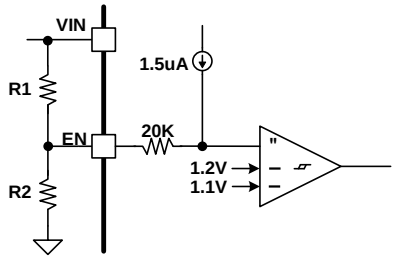
%

%

%

%

Enable and Under Voltage Lockout Threshold



Output Voltage

Internal Soft-Start

Mode Selection

Table 1. MODE Pin Set-up for Mode Selection

Power Good (PG)

%
(, , % ((
% /,
((, %

Bootstrap Voltage Regulator

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%

Over Current Limit and Hiccup Mode

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% (
) % %
% %
% %

Under-voltage Protection

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% . ,)) (
%

Over voltage Protection

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Thermal Shutdown

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(, , ℃ %
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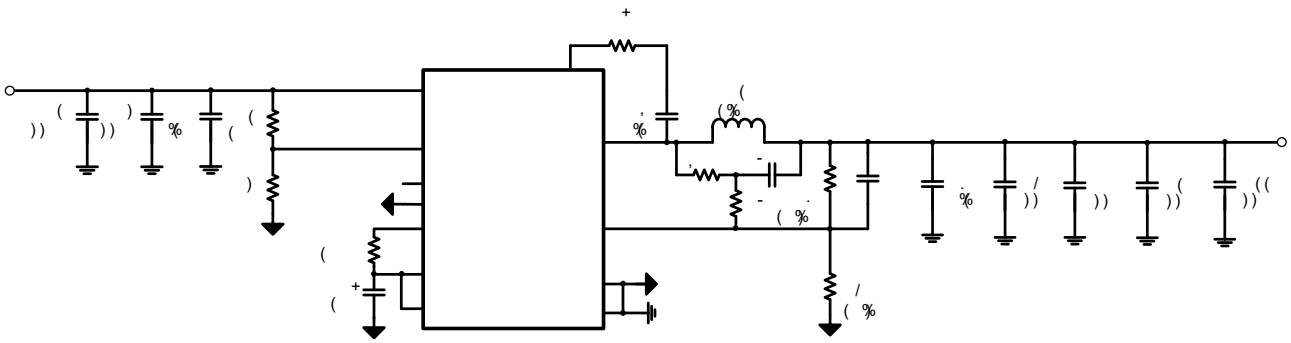
Typical Application



(- %)) ((%

Design Parameters

Design Parameters	Example Value
	( )) % (/
	(%
	( )
	+
	)

Input Capacitor Selection

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%

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() % %))+ % %

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Output Capacitor Selection

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% %

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%))

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Output Feedback Resistor Divider Selection

)) (( )

(% / %

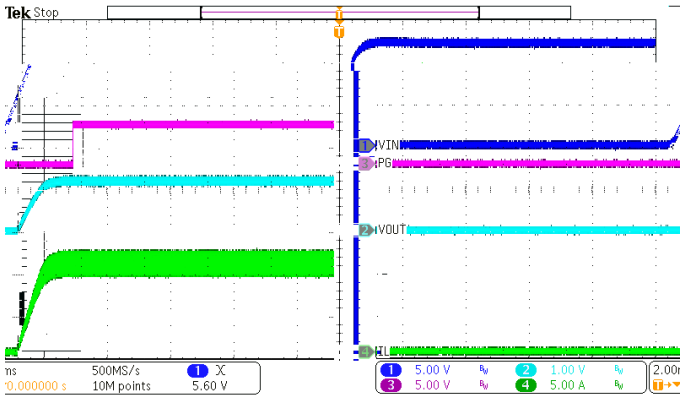
/

Table 2 Recommended Component Values for Typical Output Voltage (Vin=12V)

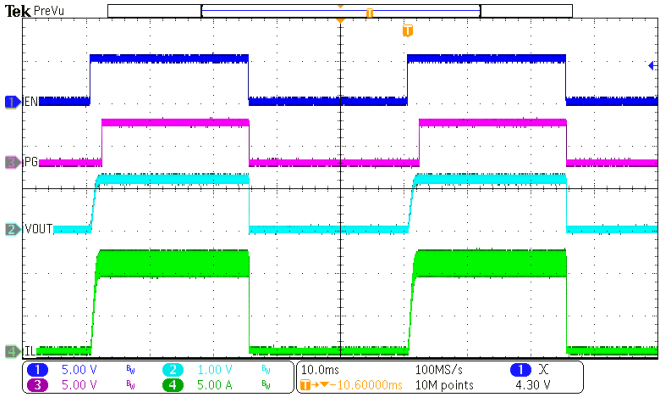
Fsw (kHz)	Vout (V)	L (µH)	R7 (k)	R8 (k)	$C_{out(min)}$(µF)	$C_{out(max)}$(µF)	Cf (pF)
+	%	%/		(%		,	&
	(%	(%	(%	(%	(	,	&
	(%	(%	) %	(%	/ /	,	(

Application Waveforms

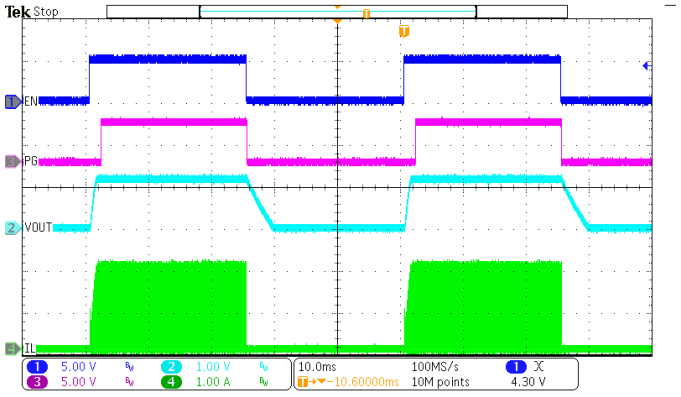
() (%), %



. % () / % ()



% ()



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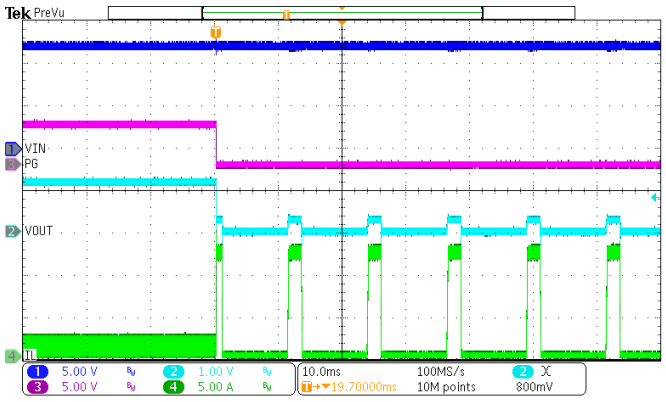
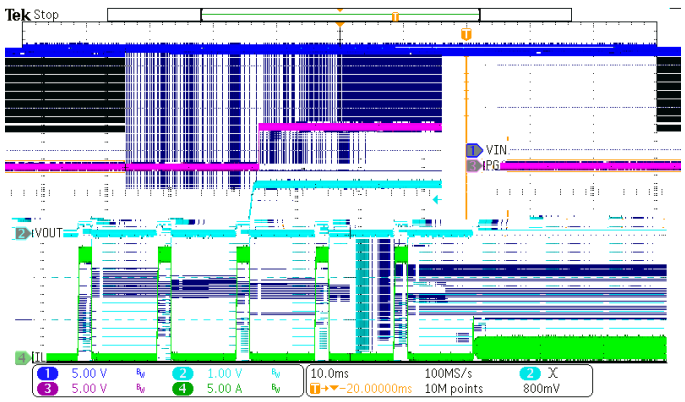


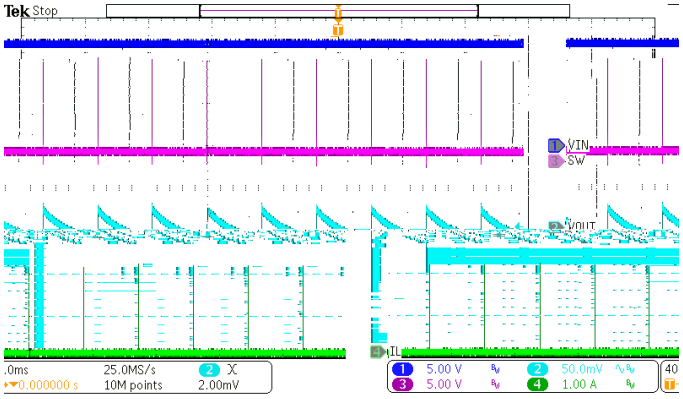
((% ((+



() % (

Application Waveforms(Continued)

( ) (%), %



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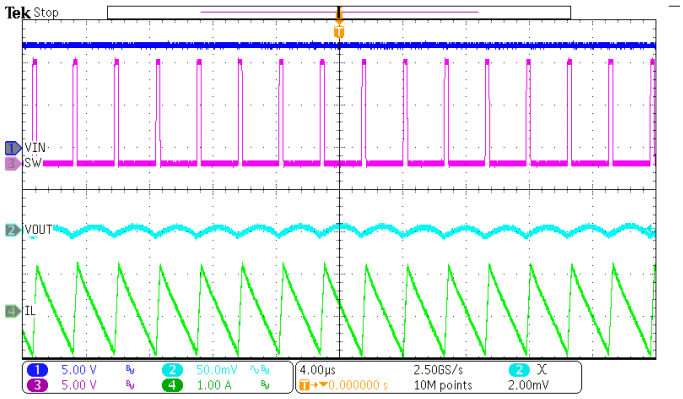

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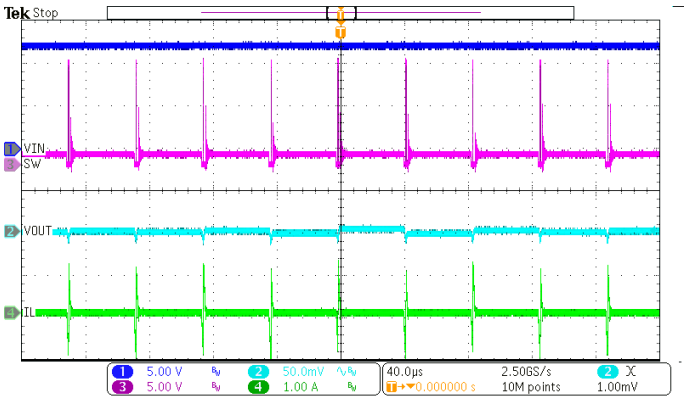

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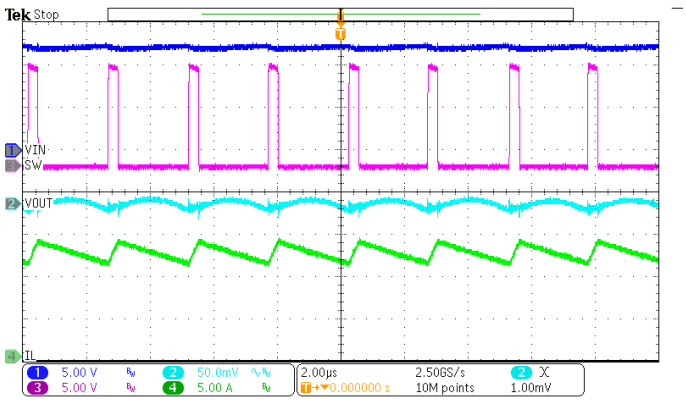
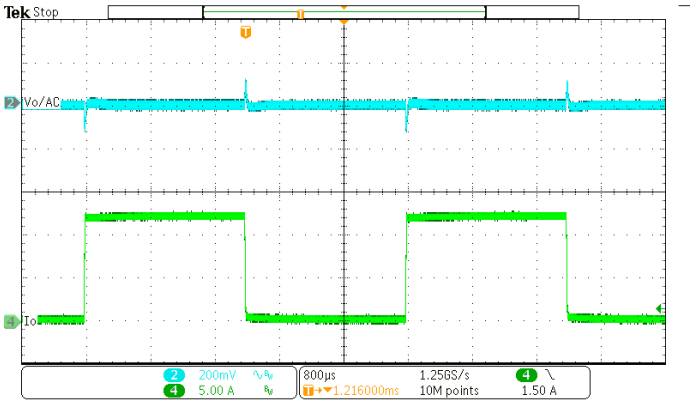
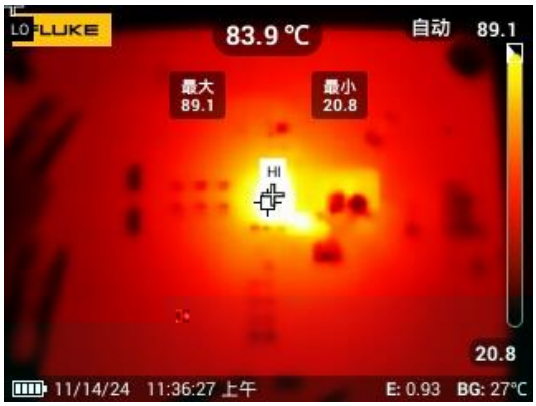


(- % () +



(. % () (% &



(/ % + ()

Layout Guideline

)) (%

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(% %

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%

%The bottom layer is a large ground plane connected to the ground plane on top layer by vias%It is recommended 8mil diameter drill holes of thermal vias, but a smaller via offers less risk of solder volume loss. On applications where solder volume loss thru the vias is of concern, plugging or tenting can be used to achieve a repeatable process.

+% %

%

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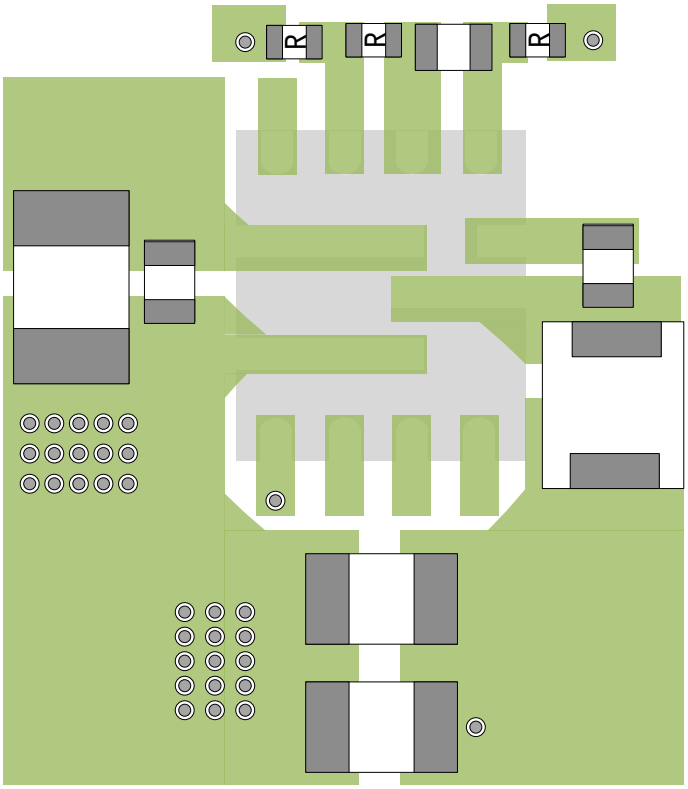
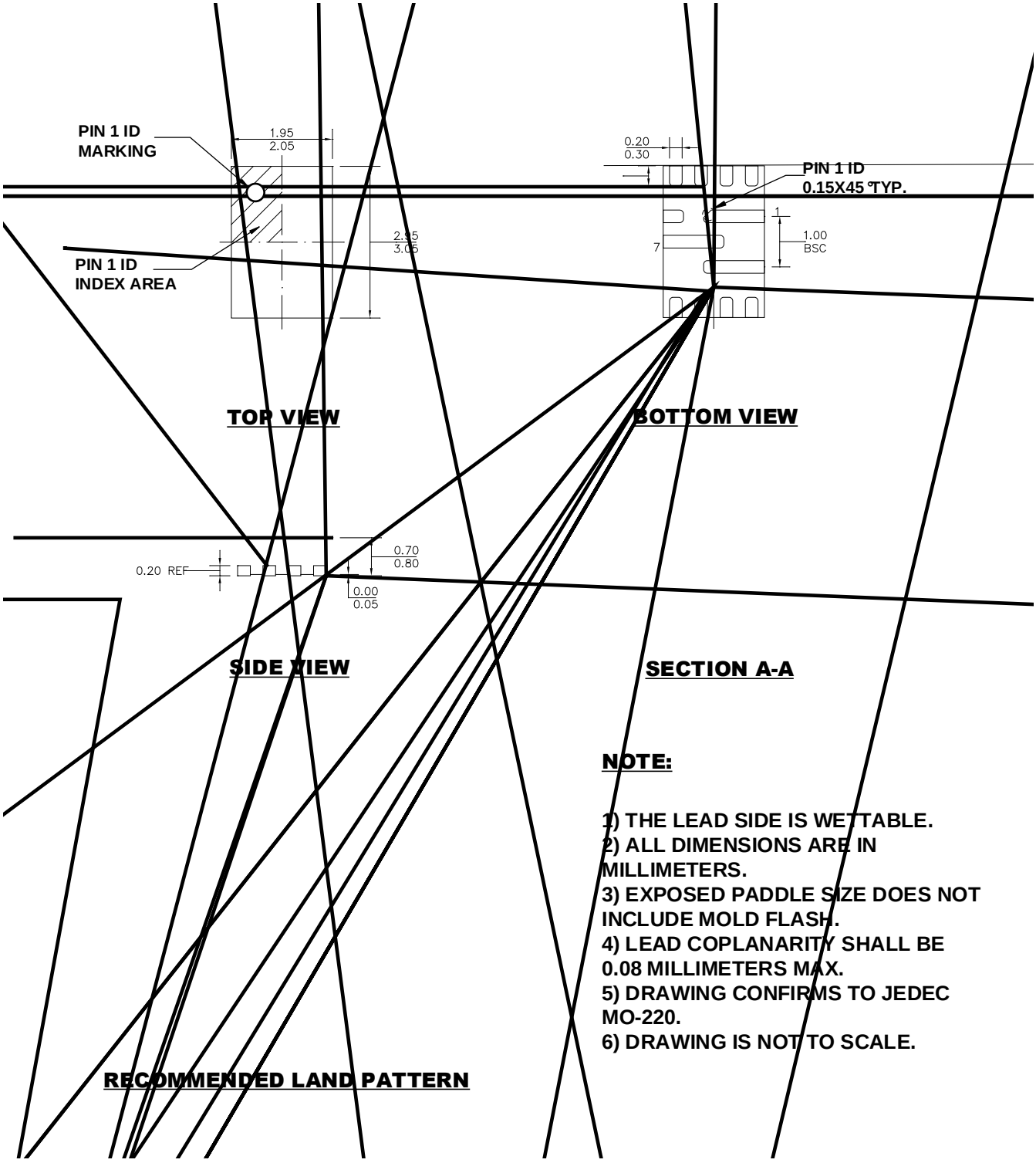
%

- % %



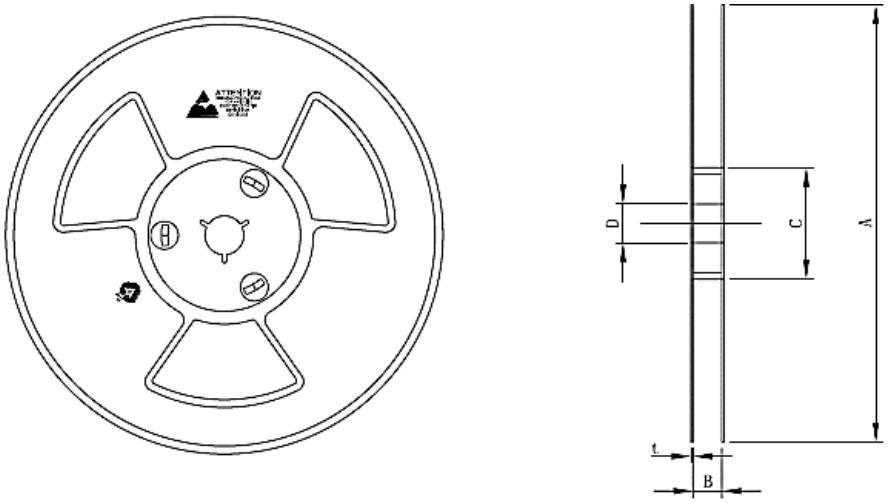
(%



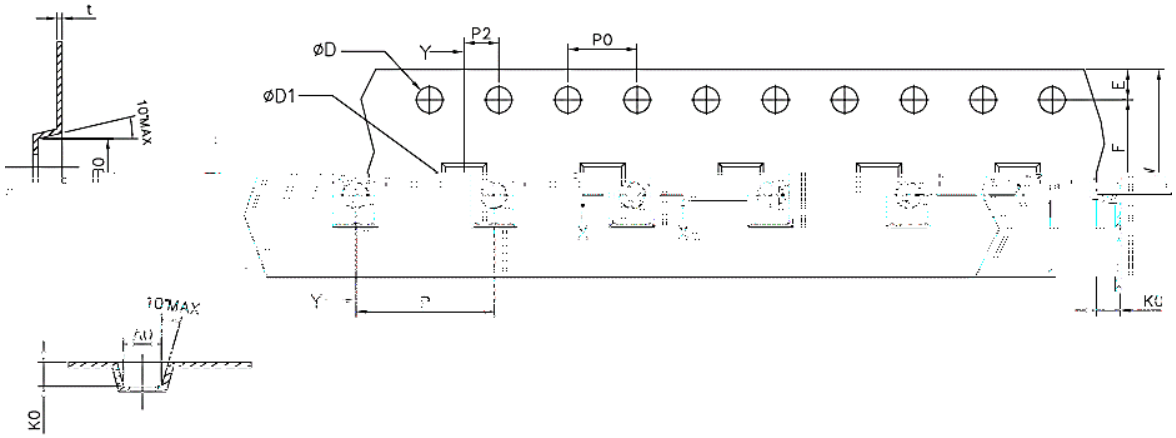
NOTE:

1) THE LEAD SIDE IS WETTABLE.
2) ALL DIMENSIONS ARE IN MILLIMETERS.
3) EXPOSED PADDLE SIZE DOES NOT INCLUDE MOLD FLASH.
4) LEAD COPLANARITY SHALL BE 0.08 MILLIMETERS MAX.
5) DRAWING CONFIRMS TO JEDEC MO-220.
6) DRAWING IS NOT TO SCALE.

RECOMMENDED LAND PATTERN



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	) /	)	
B	((%	() %	(%
C		(	((
D	(%	(%	(%
t	(%	) %	) %



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
E	(%,	(%,	(%,
F	, %,	, %	, %,
P2	(%,	) %	) %,
D		(%	(%
D1		(%	(%,
P0	%	+%	+%
W	((%	() %	() %
P	. %	/ %	/ %
A0	) %	) %	) %
B0	%	%	%
K0	(%+	(%+	(%+
t	%	%,	%.