REVISION HISTORY

Revision 1.0: Release to production.

Revision 1.1: Update DEVICE ORDER INFORMATION and the parameter of $ILIM_{LS}$ and the value of I_Q.

Revision 1.2: Add annotations for T_{sd}, t_{on_min} and t_{off_min}

RECOMMENDED OPERATING CONDITIONS

Over operating free-air temperature range unless otherwise noted

PARAMETER	DEFINITION	MIN	MAX	UNIT
V_{IN}	Input voltage range	2.8	6	V
V_{OUT}	Output voltage range	0.6	5	V

ELECTRICAL CHARACTERISTICS

V_{IN}=5V, T_J=-40℃~125℃, typical values are tested under 25℃.

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Supply and Output						
V_{IN}	Operating input voltage		2.8		6	V
V_{IN_UVLO}	Input UVLO Hysteresis	V_{IN} rising		2.7 175		V mV
I_{SD}	Shutdown current			0.7	3	uA
I_Q	Quiescent current from VIN	no load, no switching		460	645	uA

V

TYPICAL CHARACTERISTICS

Figure 1. Efficiency vs Load Current, Vout=1.2V

Figure 2. Efficiency vs Load Current, Vout=1.8V

Figure 3. Line Regulation, Io=1.5A

Figure 4. Load Regulation, Vin=5V

Figure 5. V_{FB} vs Temperature

Figure 6. UVLO vs Temperature

FUNCTIONAL BLOCK DIAGRAM

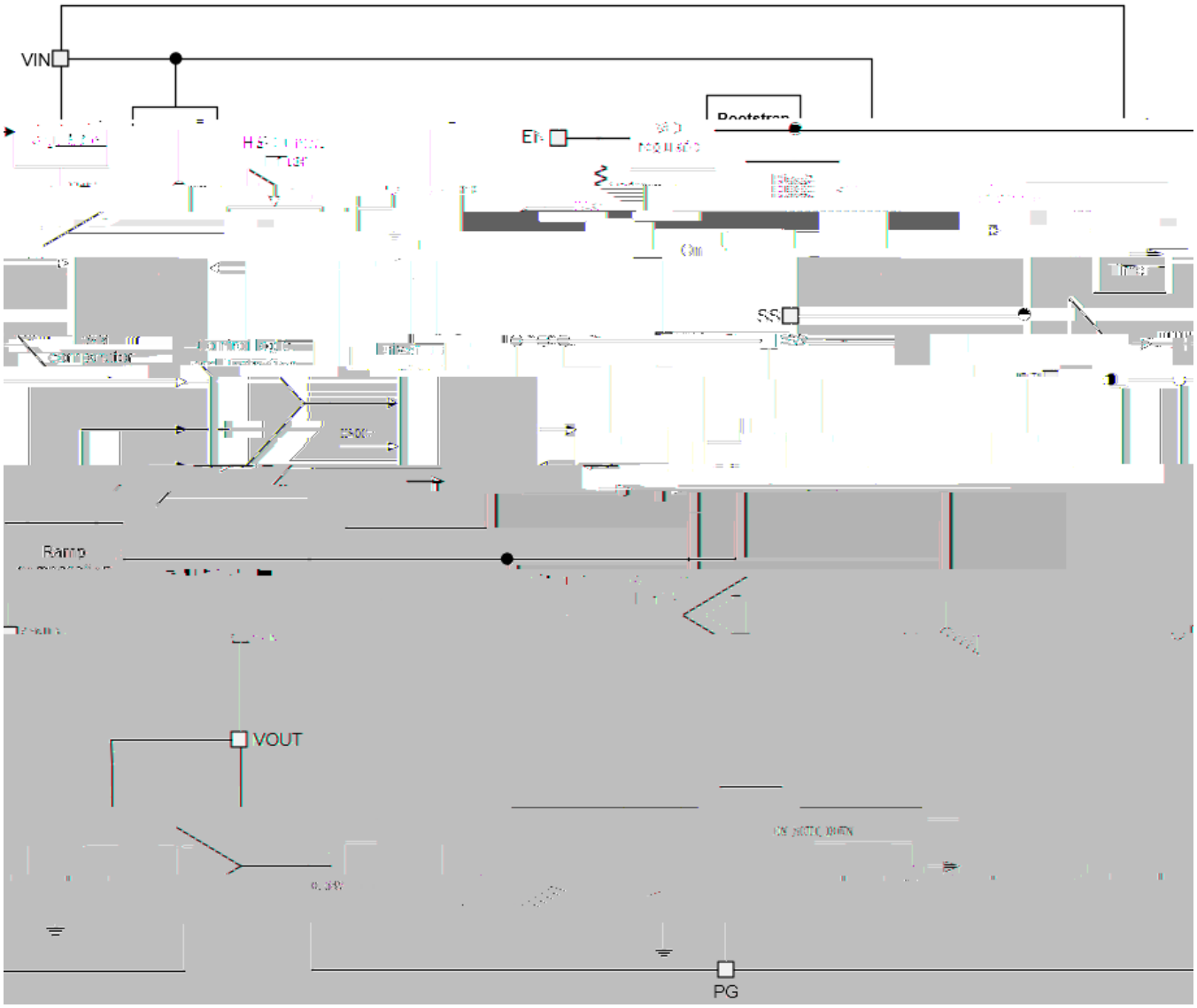


Figure 7. Functional Block Diagram

voltage is pulled to GND to indicate an output failure. If VIN and EN are not available, and PG is pulled up by an external power supply, PG will self-bias and assert. If a 100kΩ pull-up resistor is used, the voltage on the pin is below 0.4V.

Thermal Shutdown

Once the junction temperature in the SCT2132Q exceeds 160℃, the thermal sensing circuit stops converter switching and restarts with the junction temperature falling below 140℃. Thermal shutdown prevents the damage on device during excessive heat and power dissipation condition.

Output Voltage

The output voltage is set by an external resistor divider R1 and R2 in typical application schematic. Recommended R2 resistance is 10.2KΩ. Use Equation 4 to calculate R1.

(4)

where:

V_{REF} is the feedback reference voltage, typical 0.6V

Output Capacitor Selection

The selection of output capacitor will affect output voltage ripple in steady state and load transient performance.

The output ripple is essentially composed of two parts. One is caused by the inductor current ripple going through the Equivalent Series Resistance ESR of the output capacitors and the other is caused by the inductor current ripple charging and discharging the output capacitors. To achieve small output voltage ripple, choose a low-ESR output capacitor like ceramic capacitor. For ceramic capacitors, the capacitance dominates the output ripple. For simplification, the output voltage ripple can be estimated by Equation 12 desired.

(12)

Where:

Δ is the output voltage ripple.
f_{SW} is the switching frequency.
L is the inductance of inductor.
C_{OUT} is the output capacitance.
V_{OUT} is the output voltage.
V_{IN} is the input voltage.

Due to capacitor's degrading under DC bias, the bias voltage can significantly reduce capacitance. Ceramic capacitors can lose most of their capacitance at rated voltage. Therefore, leave margin on the voltage rating to ensure adequate effective capacitance. Typically, two 10μF ceramic output capacitors work for most applications.

Table 2: Component List with Typical Output Voltage BOM list

			KΩ	KΩ	option
			KΩ	KΩ	option
			KΩ	KΩ	22pF

Application Waveforms

V_{IN}=5V, V_{OUT}=1.2V, unless otherwise noted

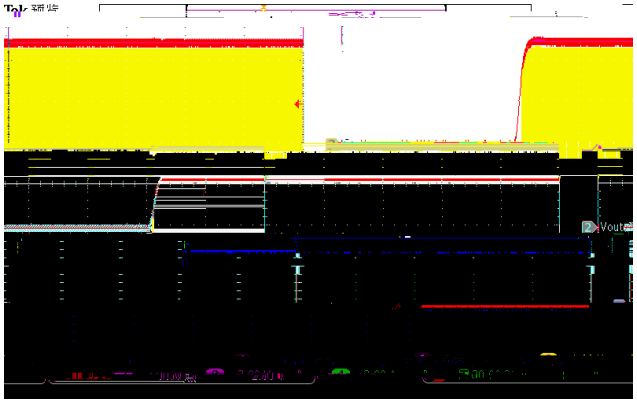


Figure 9. Power up (I_{LOAD}=3A)

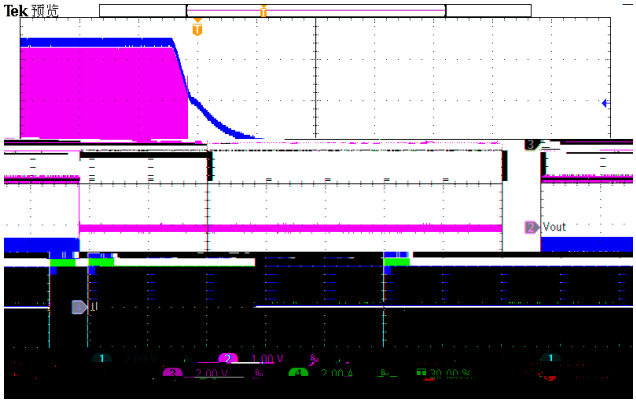


Figure 10. Power down (I_{LOAD}=3A)

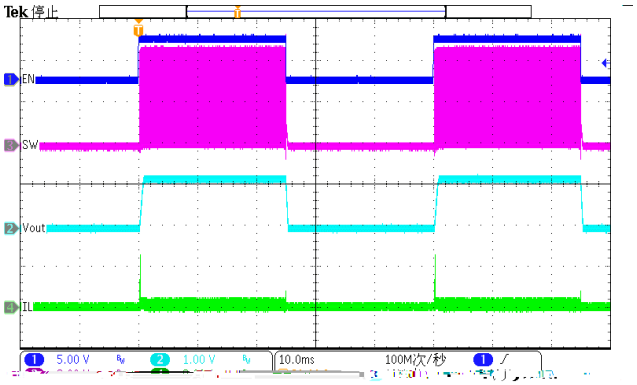


Figure 11. EN toggle (I_{LOAD}=0.1A)

Figure 12. EN toggle (I_{LOAD}=3A)

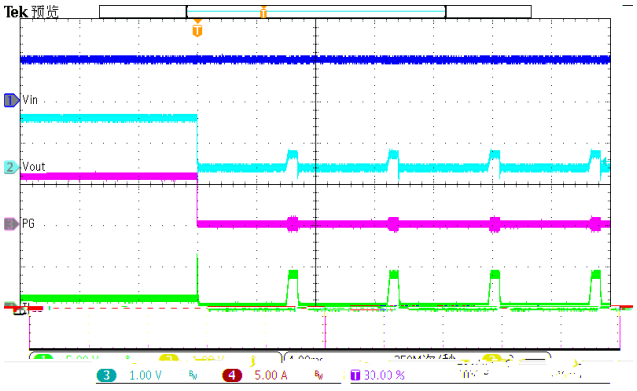


Figure 13. Over Current Protection (1A to hard short)

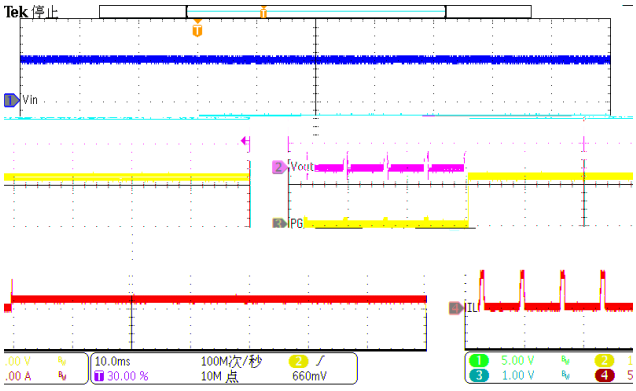
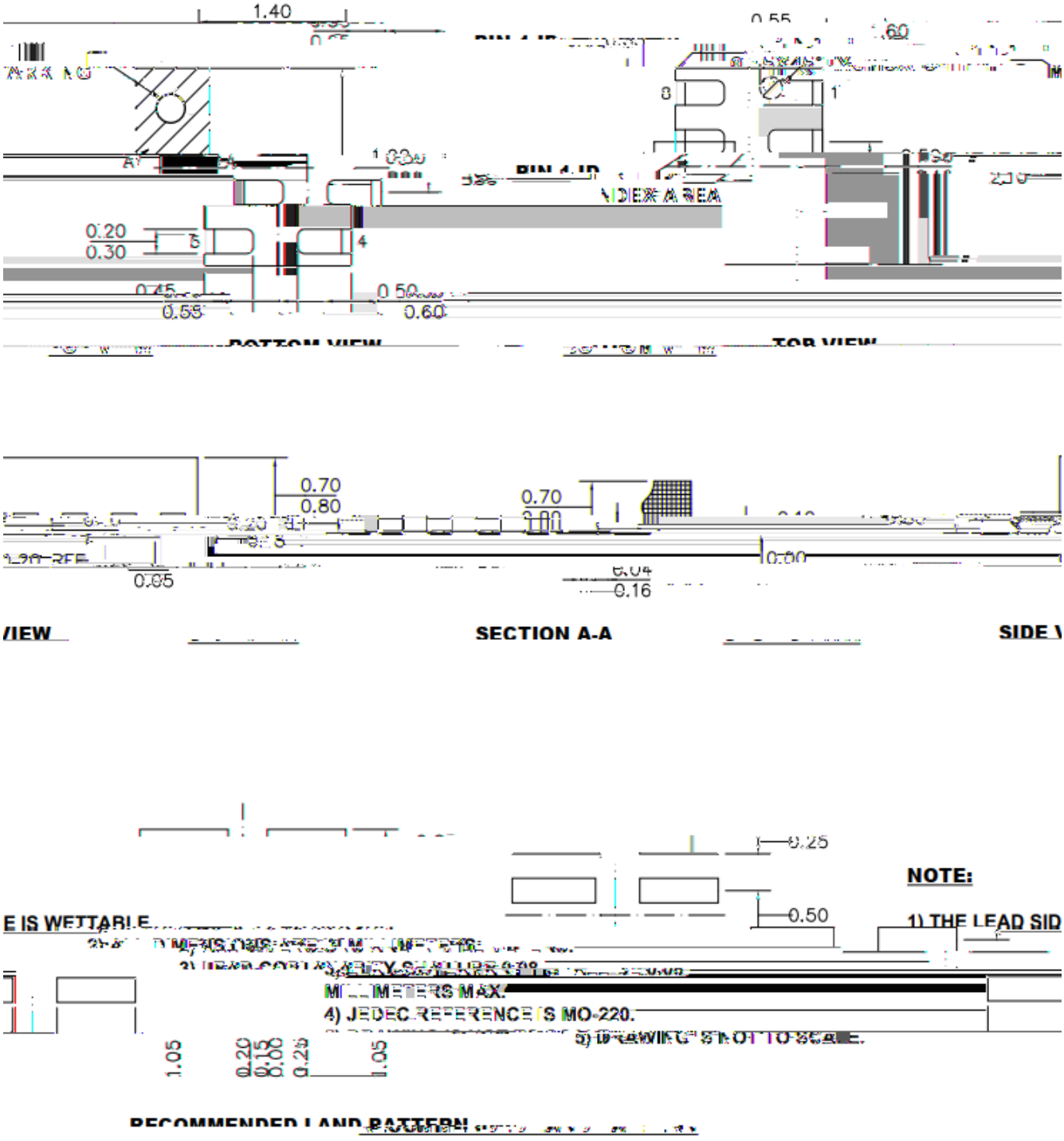
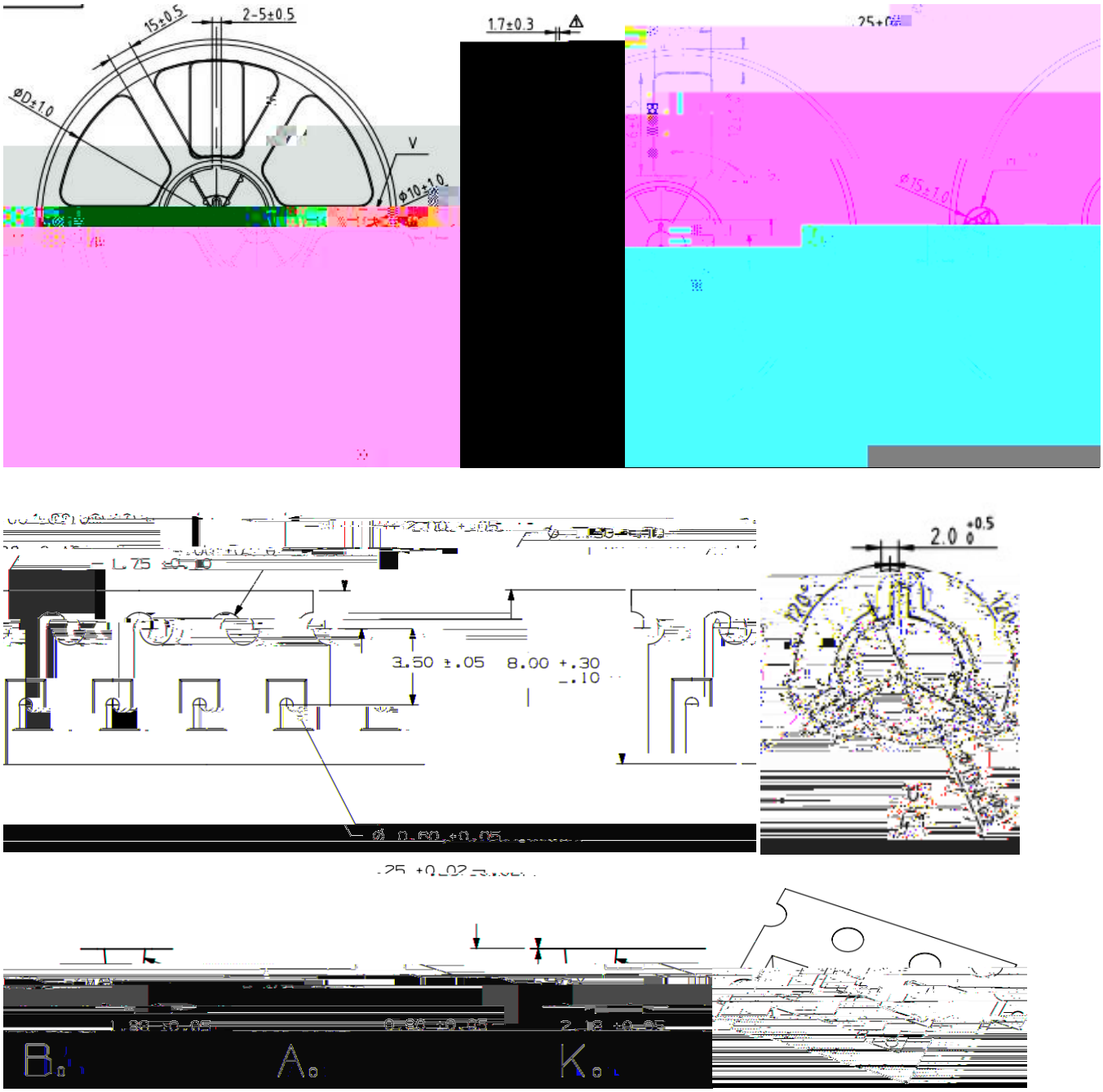


Figure 14. Over Current Release (hard short to 1A)

PACKAGE INFORMATION



TAPE AND REEL INFORMATION



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