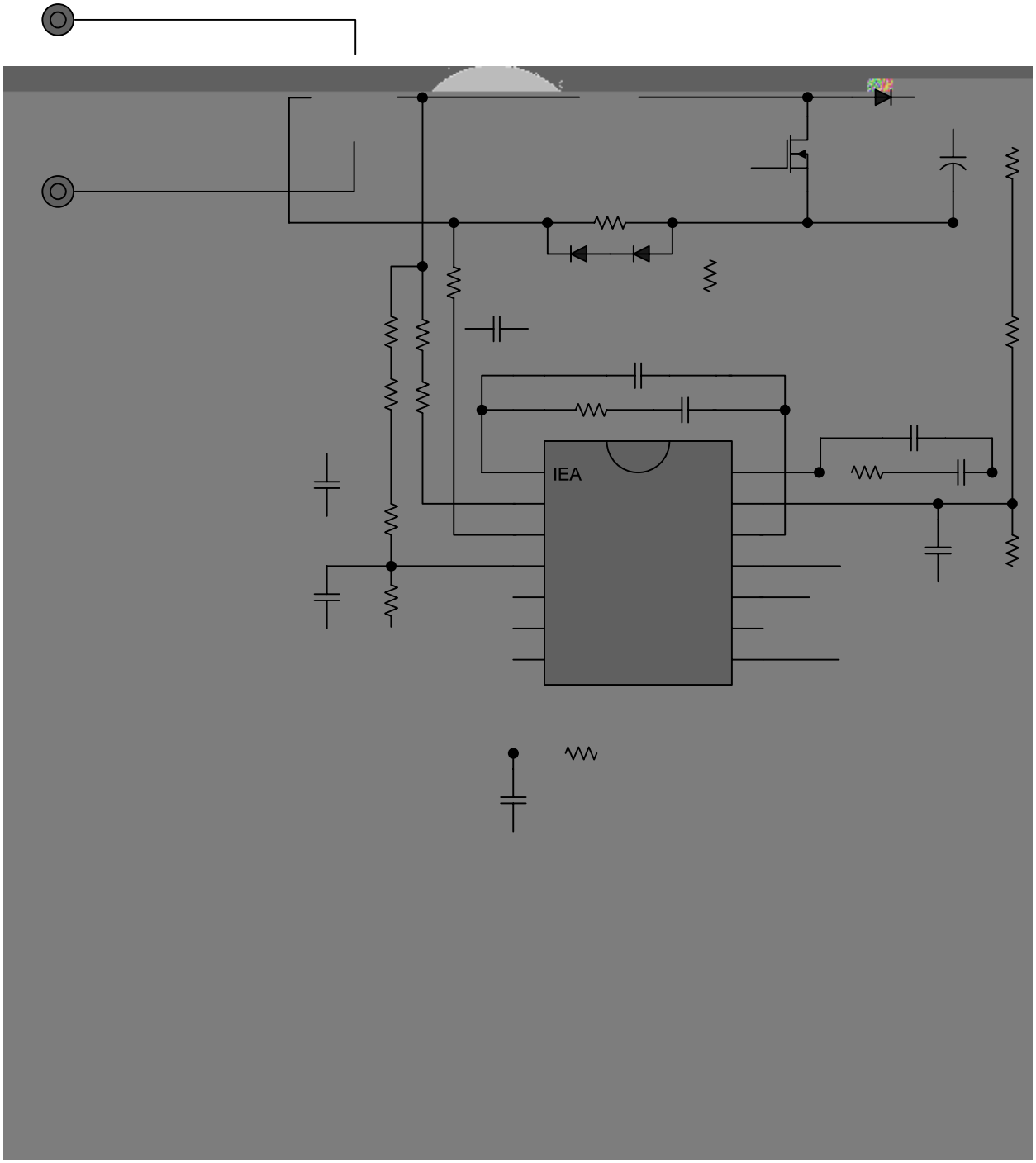
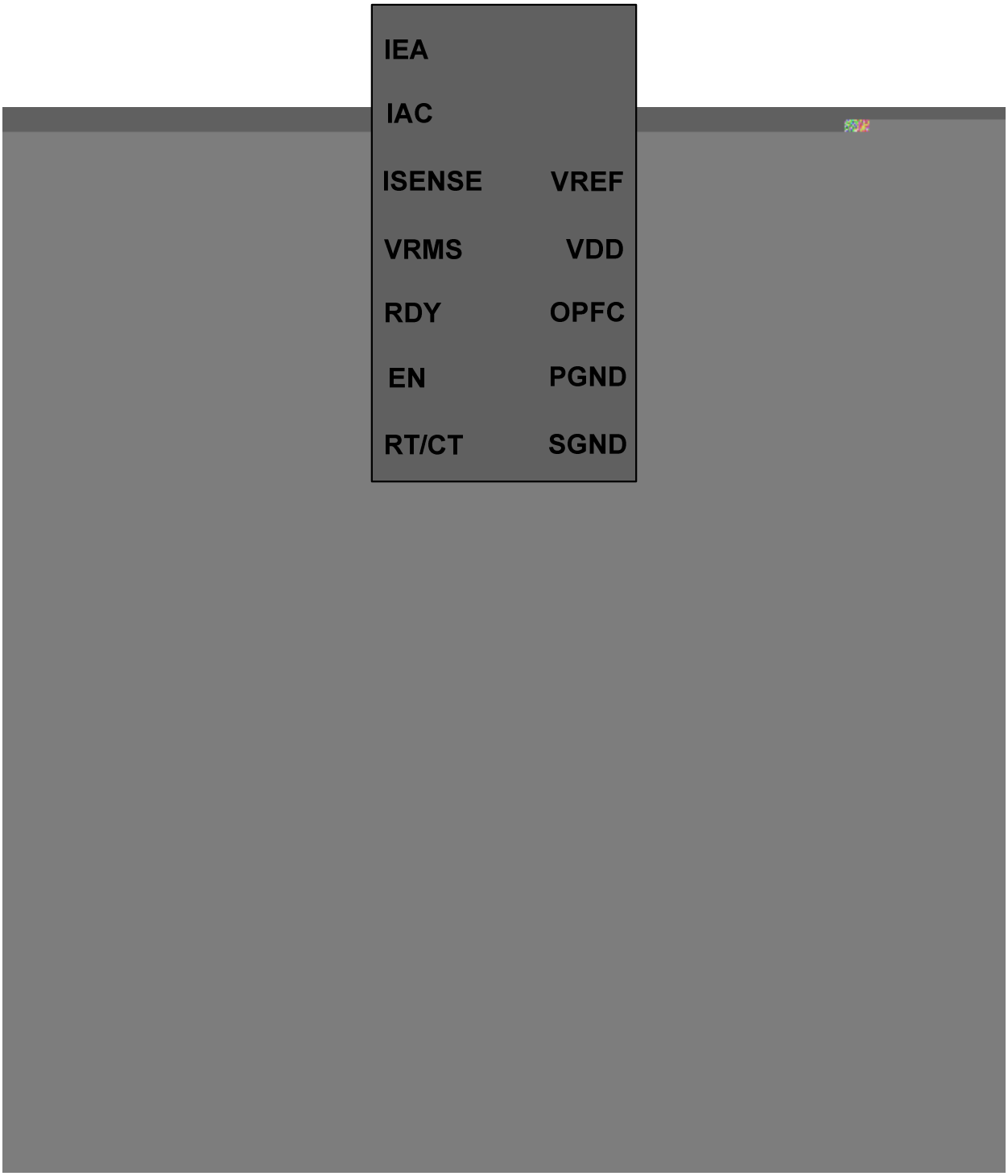
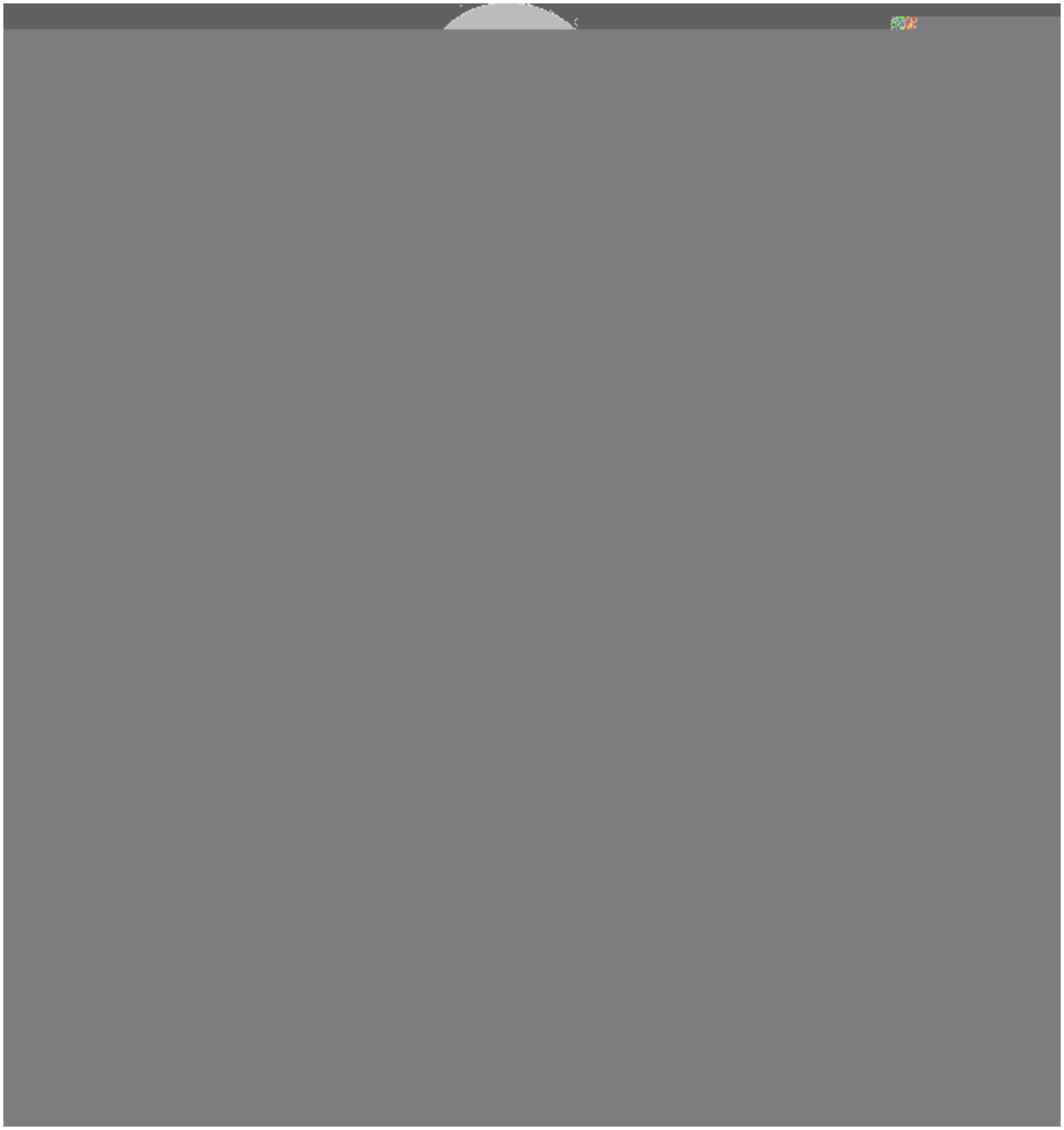
Is Now Part of

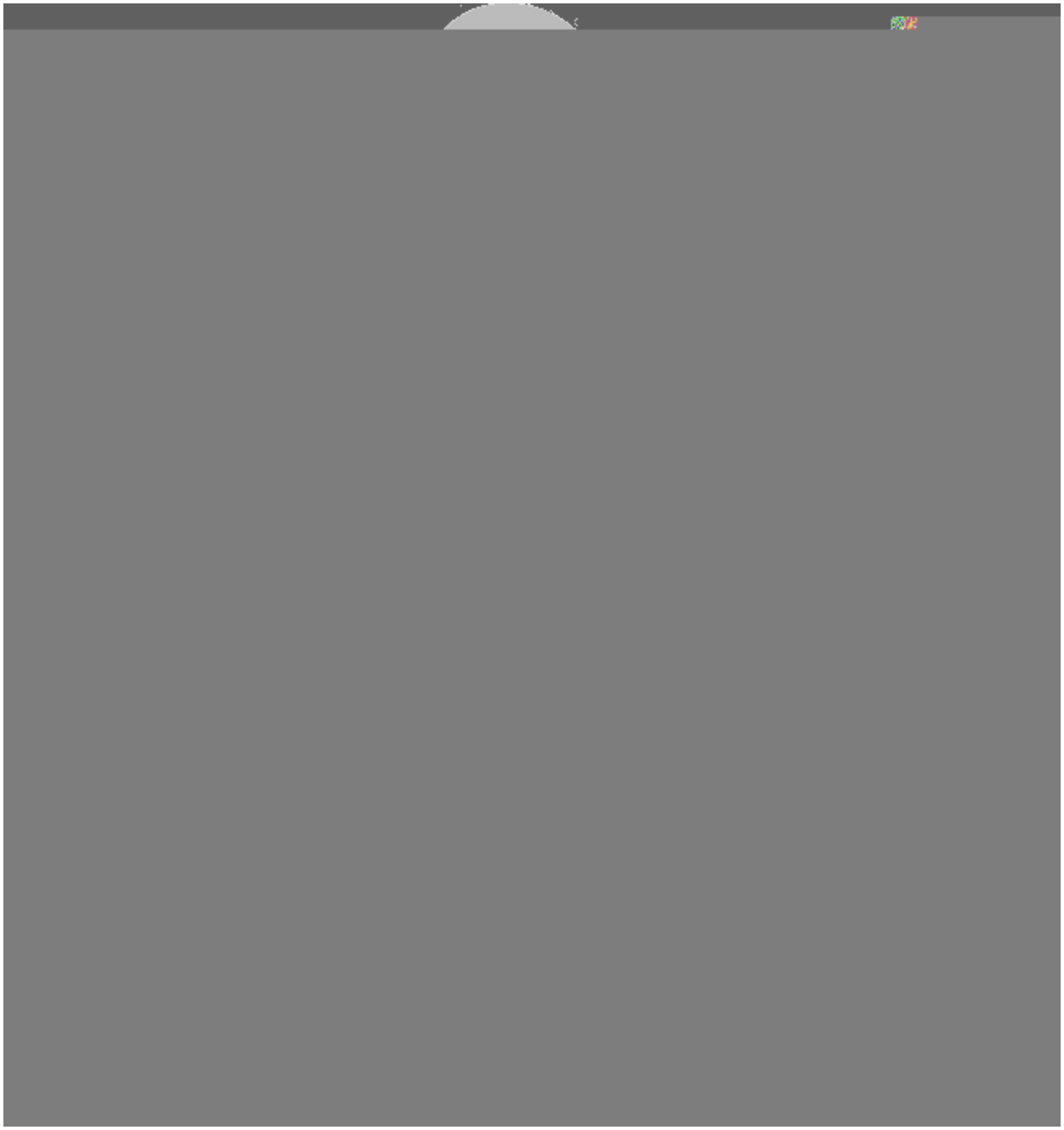
Application Diagram



Pin Configuration



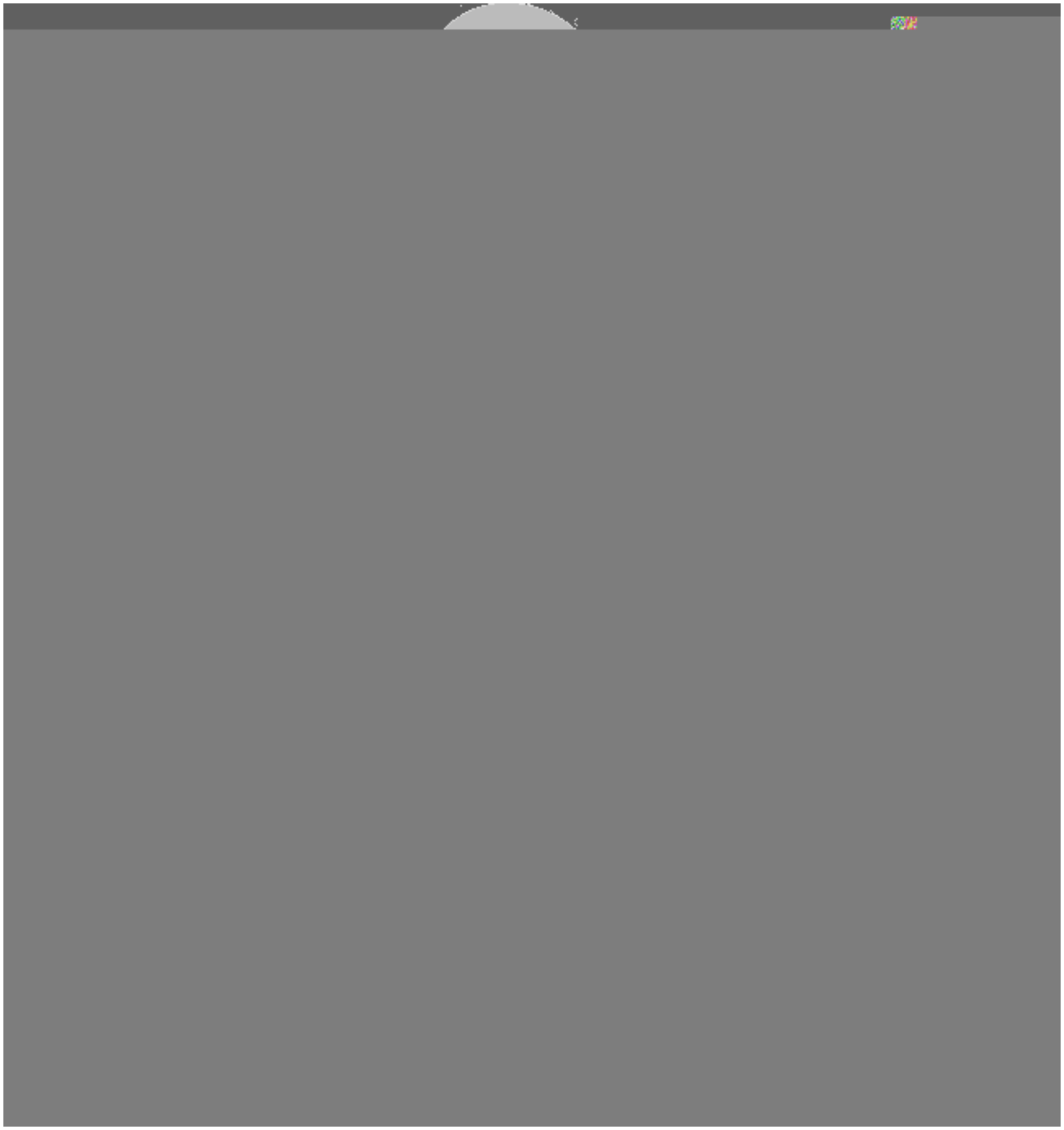




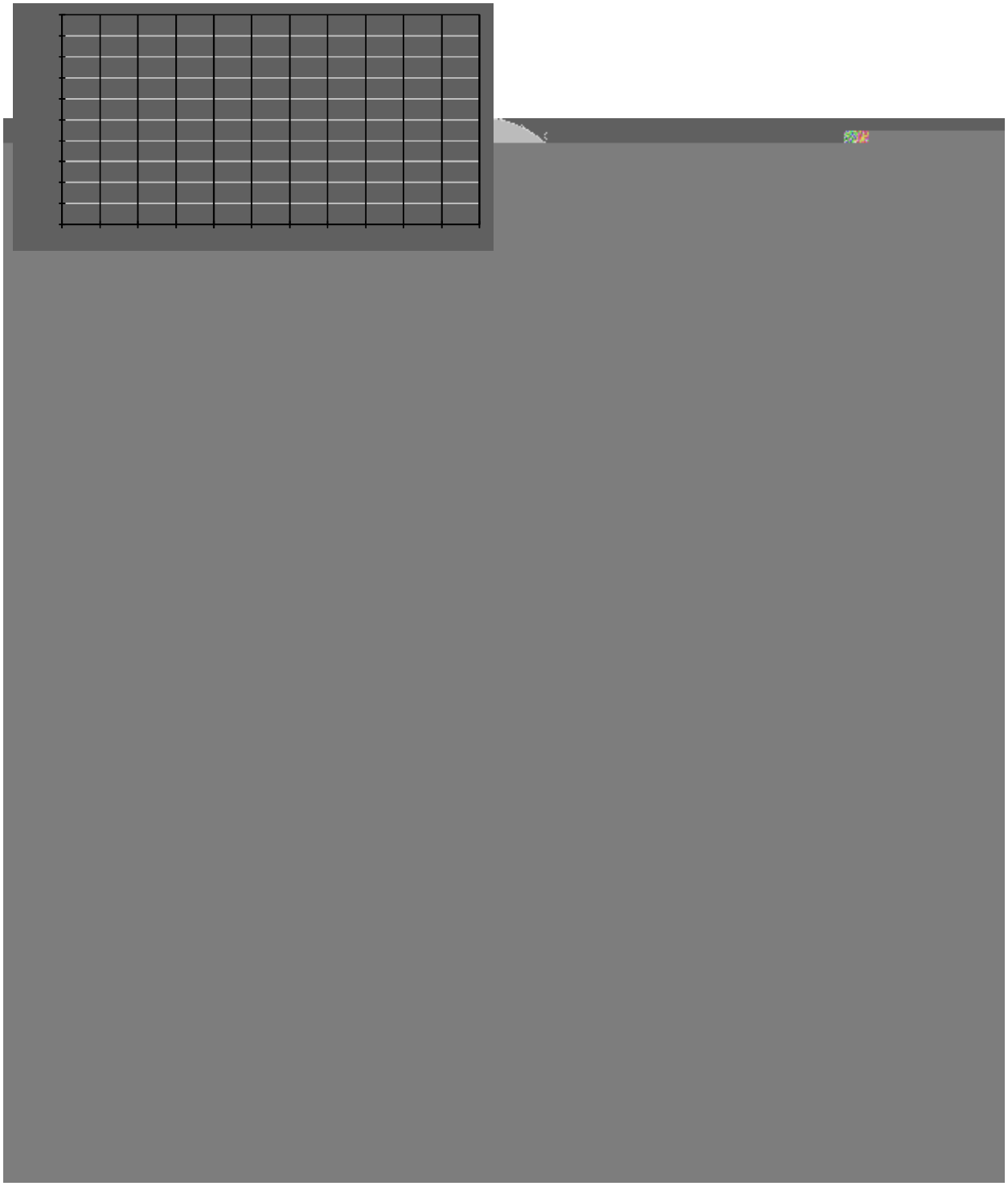
Electrical Characteristics (Continued)

Unless otherwise noted; V_{DD}=15V, T_A= 25°C, T_A=T_J, R_T=27kΩ, and C_T=1000pF.

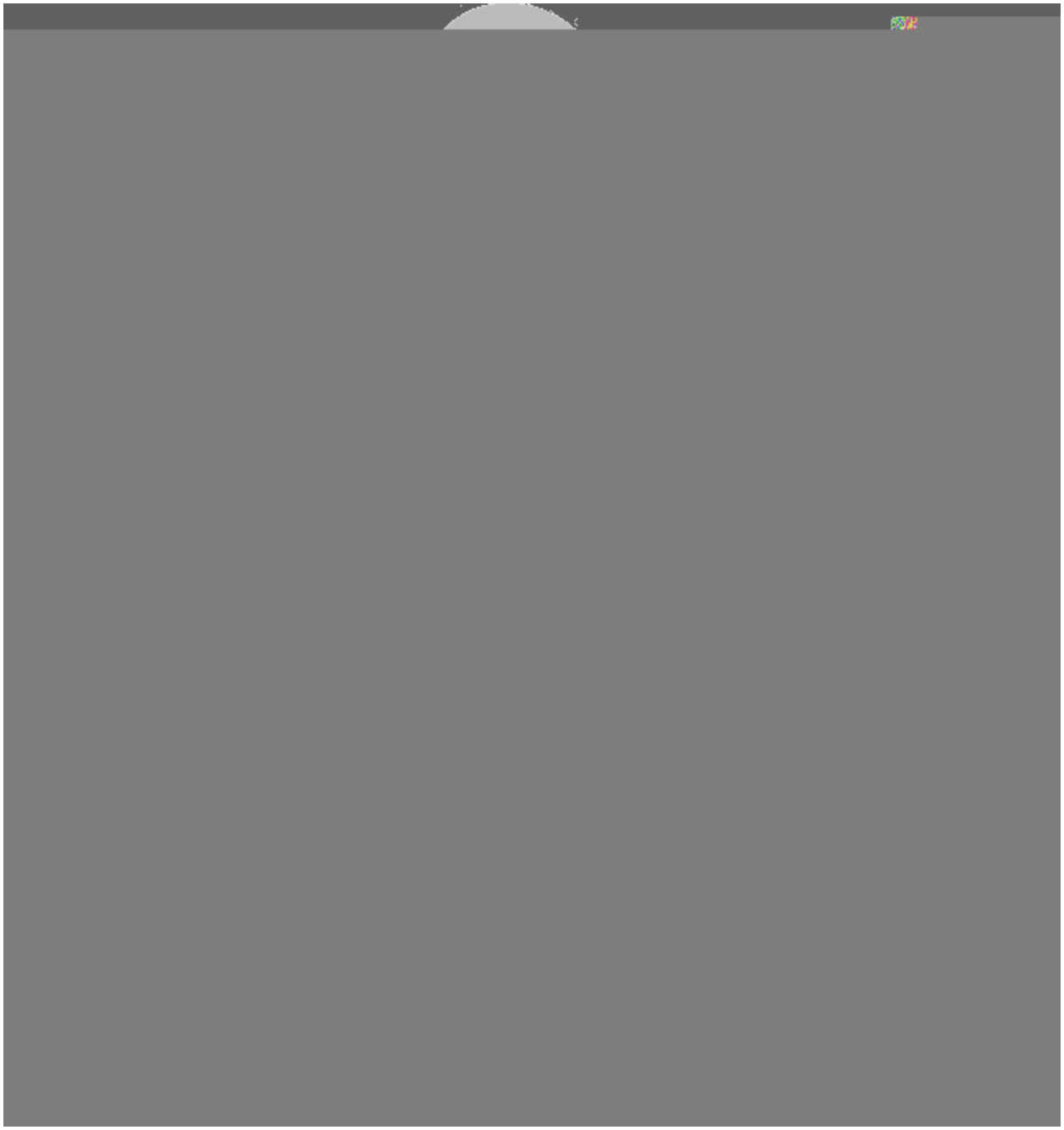
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage Error Amplifier						
V_{REF}	Reference Voltage		2.45	2.50	2.55	V
A_V	Open-Loop Gain[3]	At T_A=25°C	35	42		dB
Gm_V	Transconductance	V_{NONINV}=V_{INV}, V_{VEA}=3.75V at T_A=25°C	50	70	90	µmho
$I_{FBPFC-L}$	Maximum Source Current	V_{FBPFC}=2V, V_{VEA}=1.5V	40	50		µA
$I_{FBPFC-H}$	Maximum Sink Current	V_{FBPFC}=3V, V_{VEA}=6V		-50	-40	µA
I_{BS}						



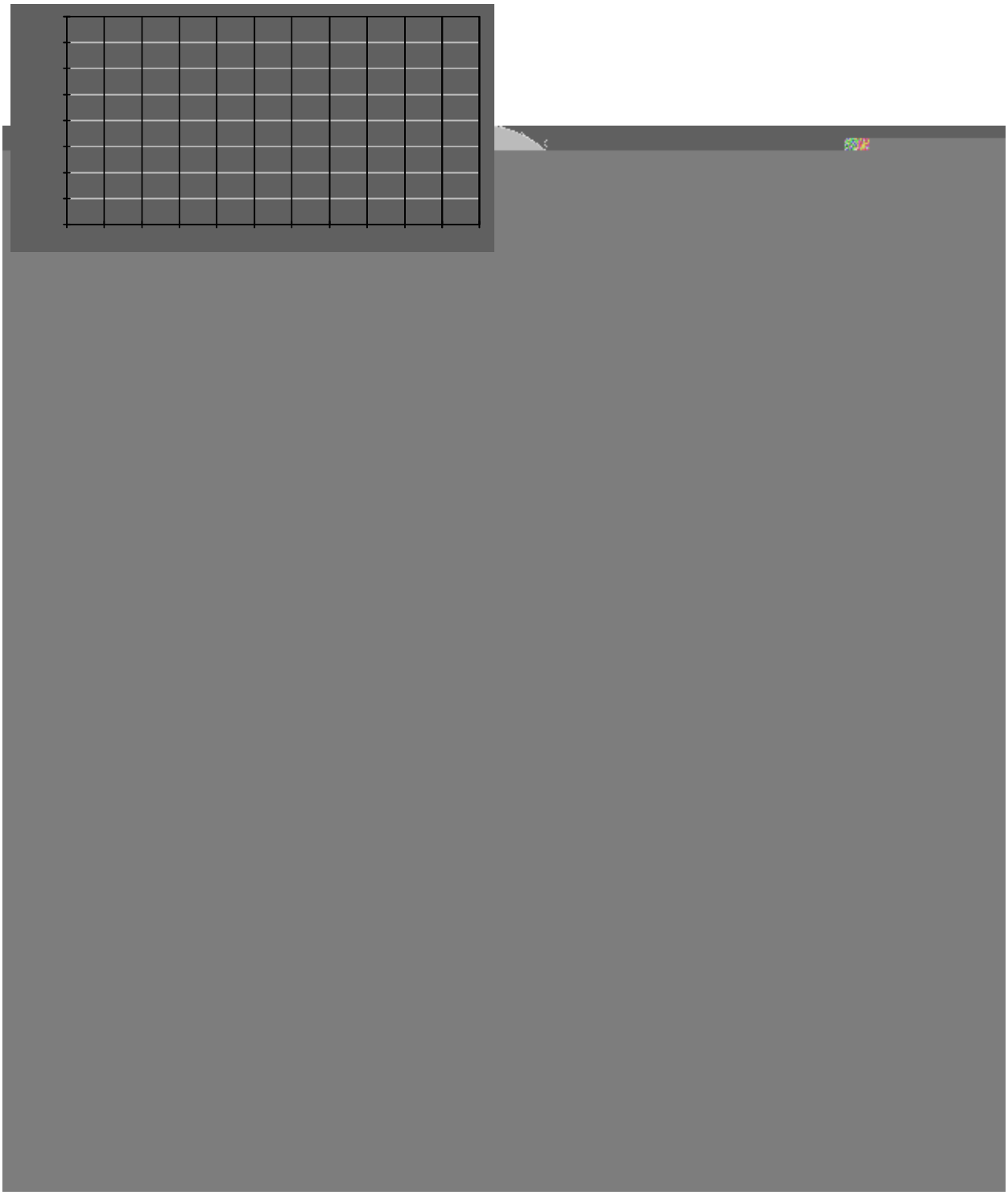
Typical Performance Characteristics



Typical Performance Characteristics



Typical Performance Characteristics (Continued)



Functional Description

Oscillator

The internal oscillator frequency of FAN6982 is determined by the timing resistor and capacitor on the RT/CT pin, but note that the optimum operation for FAN6982 is between 50 and 75kHz. The frequency of the internal oscillator is given by:

$$f_{OSC} = \frac{1}{0.56 \cdot R_T \cdot C_T + 360 C_T} \quad (1)$$

The dead time for the PFC gate drive signal is determined by

$$t_{DEAD} = 360 C_T \quad (2)$$

The dead time should be smaller than 2% of switching period to minimize line current distortion around line zero crossing.

Gain Modulator

Gain modulator is the key block for PFC stage because it provides the reference to the current control error amplifier for the input current shaping, as shown in Figure 23. The output current of gain modulator is a function of V_{EA}, I_{AC} and V_{RMS}. The gain of the gain modulator is given as a ratio between I_{MO} and I_{AC} with a given V_{RMS} when V_{EA} is saturated to high. The gain is inversely proportional to V_{RMS}^2, as shown in Figure 24, to implement line feed-forward. This automatically adjusts the reference of current control error amplifier according to the line voltage such that the input power of PFC converter is not changed with line voltage, as shown in, Figure 25.

The rectified sinusoidal signal is obtained by the current flowing into the IAC pin. The resistor R_{IAC} should be large enough to prevent saturation of the gain modulator as:

$$\frac{\sqrt{2}V_{LINE.BO}}{R_{IAC}} \cdot G^{MAX} < 159\mu A \quad (3)$$

where $V_{LINE.BO}$ is the line voltage that trips brownout protection, G^{MAX} is the maximum modulator gain when V_{RMS} is 1.08V, and 159μA is the maximum output current of the gain modulator.

Current-Control of Boost Stage

As shown in Figure 27 the FAN6982 employs two control loops for power factor correction, a current-control loop and a voltage-control loop. The current-control loop shapes inductor current, as shown in Figure 28, based on the reference signal obtained at IAC pin as:

$$R_{CS1} = I_{MO} \cdot R_M = I_{AC} \cdot G \cdot R_M \quad (4)$$

1.70