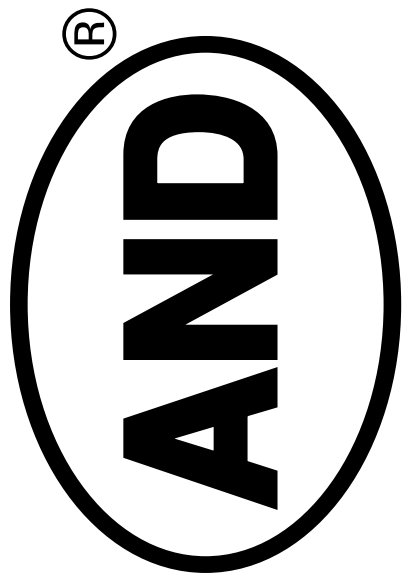




Optoelectronics

Light Emitting Diodes

Application Notes



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Drive Methods of LED Lamps

DC Drive Techniques

LEDs are current driven devices which means that when using a constant voltage power, a current limiting resistor must be used. Figure 1 shows circuit examples for the DC drive.

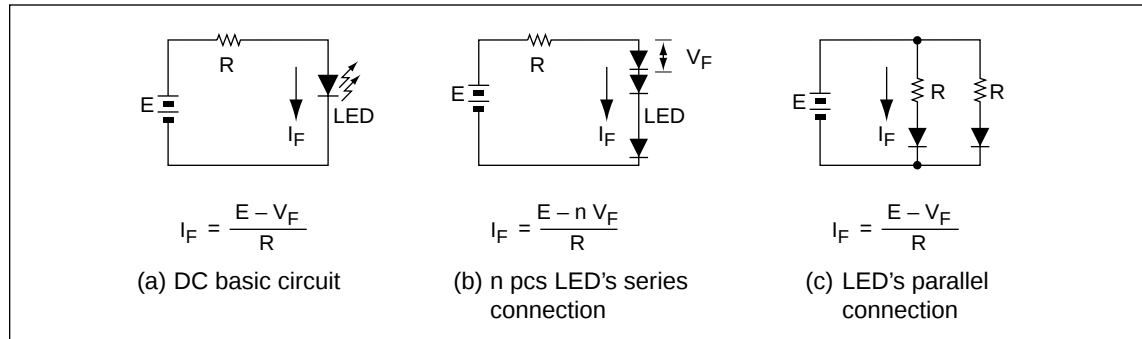


Figure 1

AC Drive Techniques

A reverse bias protective circuit is necessary for operating LEDs in an AC mode to prevent exceeding the maximum reverse voltage. Protective diode circuits are shown in Figure 2.

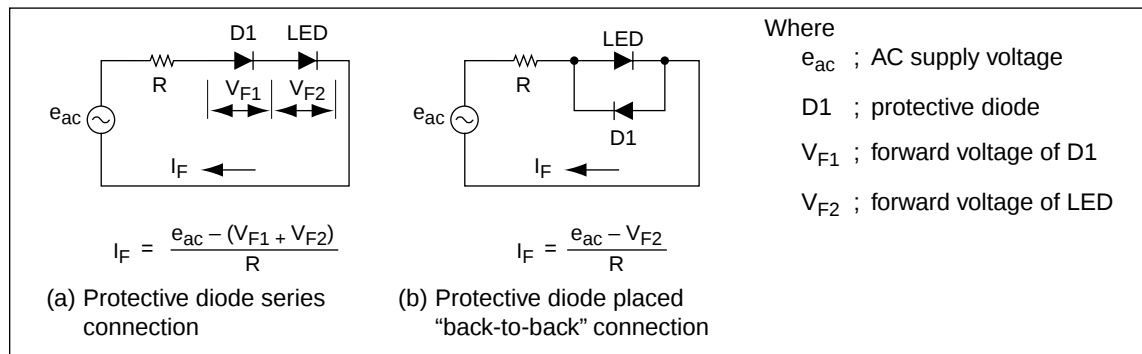


Figure 2

Logic Circuit Drive Techniques

Figure 3 illustrates different methods to drive LEDs using integrated circuits.

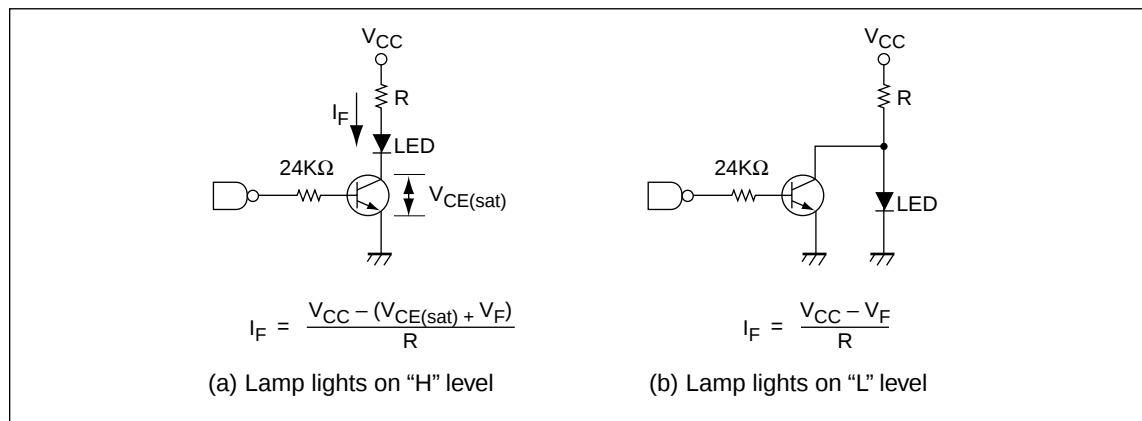


Figure 3

Allowable Pulse Forward Current of LED Lamps

When a design requires an LED lamp to be operated in the pulse mode, allowable pulse forward current (I_{FP}) is determined from the characteristic curves according to driving conditions (pulse width, duty ratio).

Applied Pulse

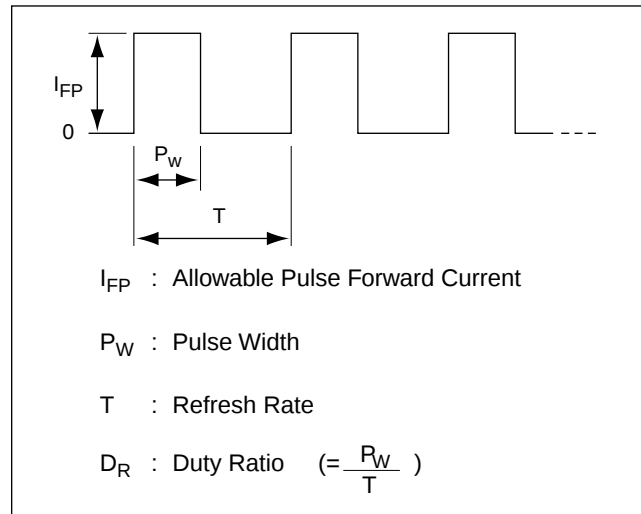


Figure 4

When ambient temperature rises above 25°C, I_{FP} needs to be determined from Figure 5.

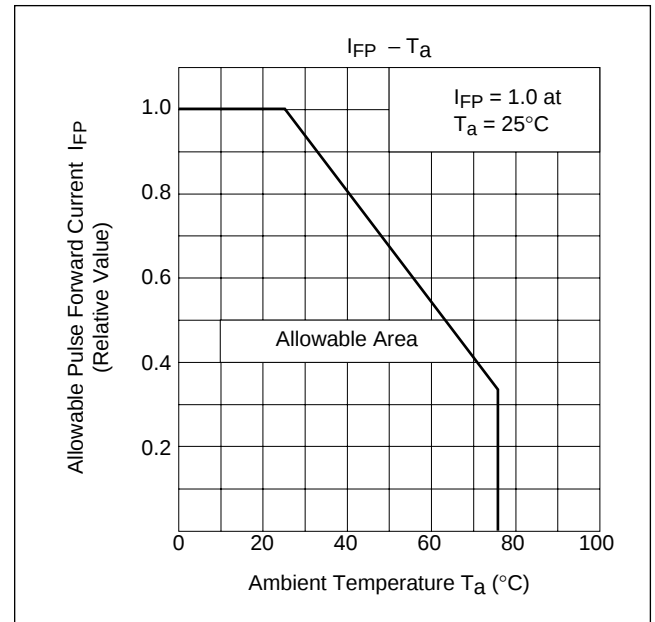


Figure 5

Characteristic Charts for Determining Allowable Pulse Forward Current

GaP Red LEDs

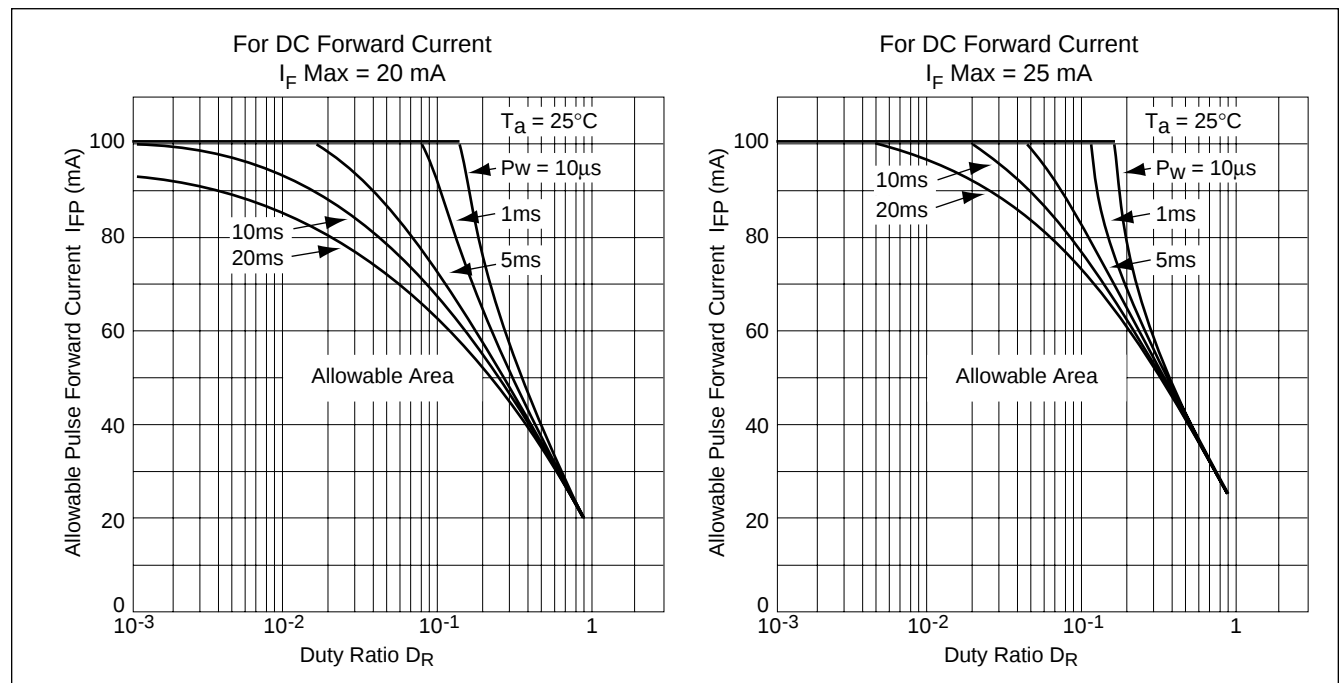


Figure 6

Figure 7

Application Notes

Characteristic Charts for Determining Allowable Pulse Forward Current

GaAsP, GaAlAs, InGaAlP & GaP Green LEDs

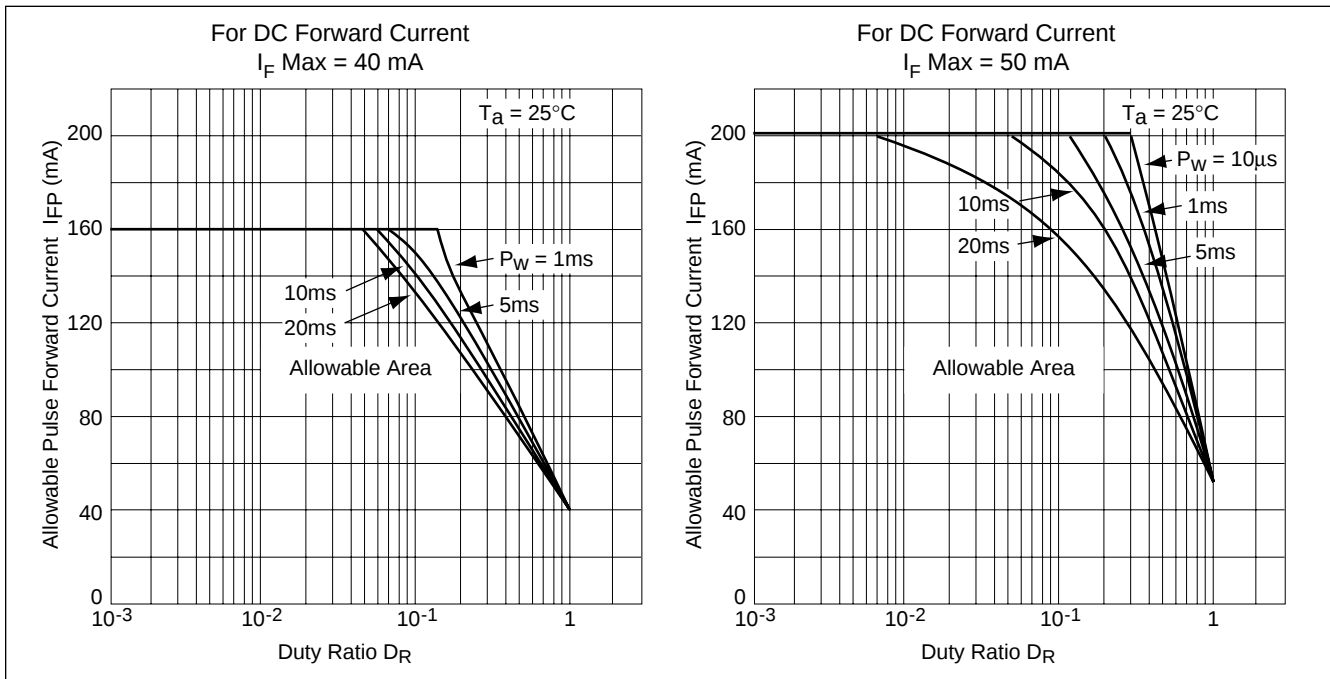


Figure 8

Figure 9

GaAsP, GaAlAs, InGaAlP & GaP Green LEDs

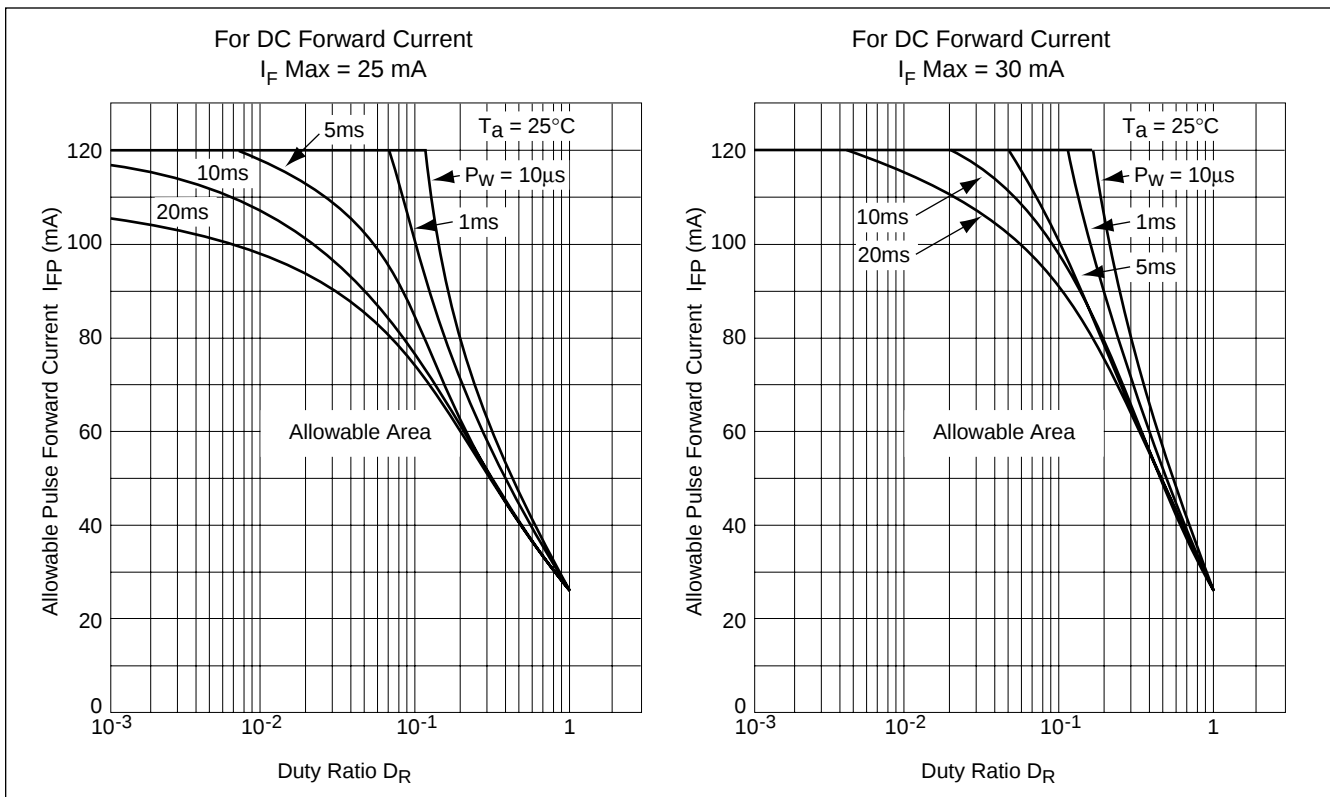


Figure 10

Figure 11