

Typical Performance Curves (Continued)

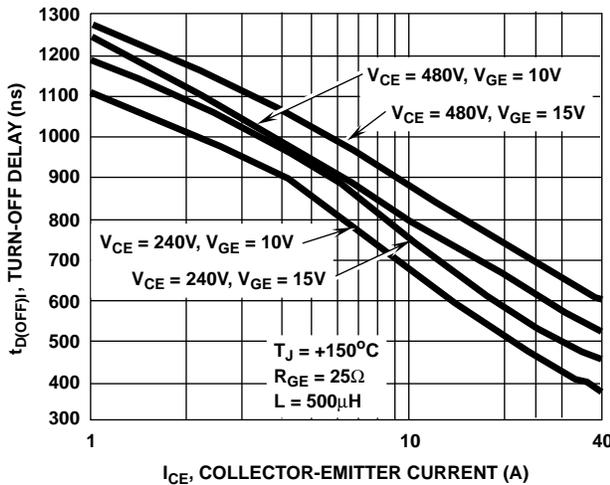
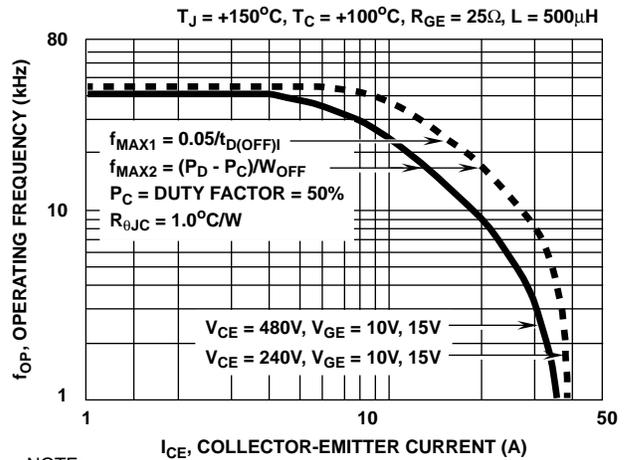


FIGURE 9. TURN-OFF DELAY vs COLLECTOR-EMITTER CURRENT



NOTE:
 P_D = ALLOWABLE DISSIPATION P_C = CONDUCTION DISSIPATION
 FIGURE 10. OPERATING FREQUENCY vs COLLECTOR-EMITTER CURRENT AND VOLTAGE

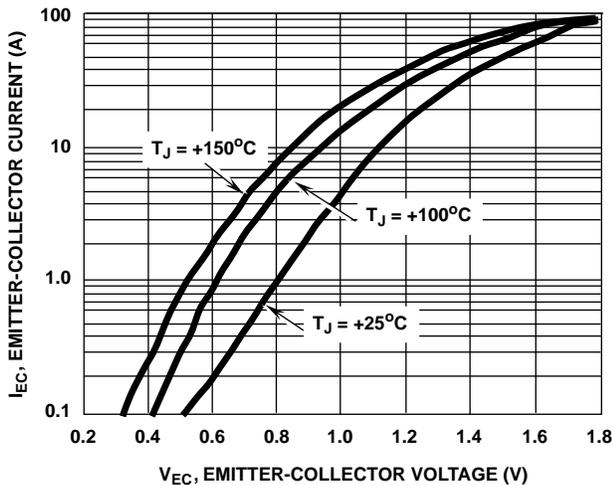


FIGURE 11. FORWARD VOLTAGE vs FORWARD CURRENT CHARACTERISTIC

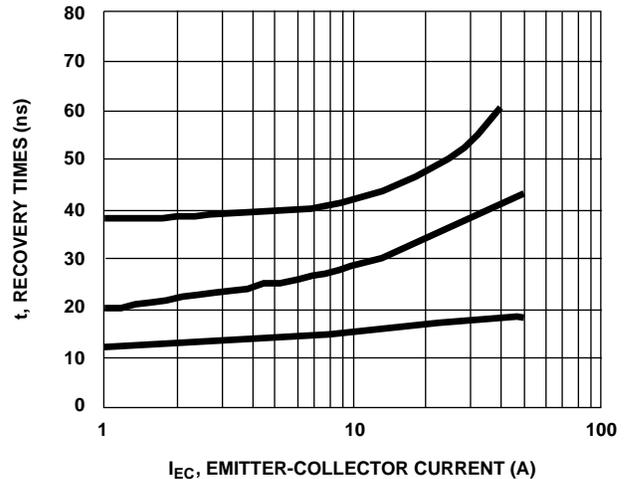


FIGURE 12. TYPICAL t_{RR} , t_A , t_B vs FORWARD CURRENT

Operating Frequency Information

Operating frequency information for a typical device (Figure 10) is presented as a guide for estimating device performance for a specific application. Other typical frequency vs collector current (I_{CE}) plots are possible using the information shown for a typical unit in Figures 7, 8 and 9. The operating frequency plot (Figure 10) of a typical device shows f_{MAX1} or f_{MAX2} whichever is smaller at each point. The information is based on measurements of a typical device and is bounded by the maximum rated junction temperature.

f_{MAX1} is defined by $f_{MAX1} = 0.05/t_{D(OFF)}$. $t_{D(OFF)}$ deadtime (the denominator) has been arbitrarily held to 10% of the on-state time for a 50% duty factor. Other definitions are possible. $t_{D(OFF)}$ is defined as the time between the 90% point of the trailing edge of the input pulse and the point where the collector current falls to 90% of its maximum value. Device

turn-off delay can establish an additional frequency limiting condition for an application other than T_{JMAX} . $t_{D(OFF)}$ is important when controlling output ripple under a lightly loaded condition.

f_{MAX2} is defined by $f_{MAX2} = (P_D - P_C)/W_{OFF}$. The allowable dissipation (P_D) is defined by $P_D = (T_{JMAX} - T_C)/R_{\theta JC}$. The sum of device switching and conduction losses must not exceed P_D . A 50% duty factor was used (Figure 10) and the conduction losses (P_C) are approximated by $P_C = (V_{CE} \cdot I_{CE})/2$. W_{OFF} is defined as the integral of the instantaneous power loss starting at the trailing edge of the input pulse and ending at the point where the collector current equals zero ($I_{CE} = 0A$).

The switching power loss (Figure 10) is defined as $f_{MAX2} \cdot W_{OFF}$. Turn-on switching losses are not included because they can be greatly influenced by external circuit conditions and components.