DARLINGTTON CLASS AB PUSHPULL AMPLIFIER
Push Pull Amplifier

- When an amplifier is biased at cutoff so that it operates in the linear region for 180 degree of the input cycle and is in cutoff for 180 degree, it is a class B amplifier. Class AB amplifiers are biased to conduct for slightly more than 180 degree. The primary advantage of a class B or class AB amplifier over a class A amplifier is that either one is more efficient than a class A amplifier; you can get more output power for a given amount of input power. A disadvantage of class B or class AB is that it is more difficult to implement the circuit in order to get a linear reproduction of the input waveform. The term push-pull refers to a common type of class B or class AB amplifier circuit in which two transistors are used on alternating half-cycles to reproduce the input waveform at the output.
Darlington Push Pull Amplifier

- The complementary Darlington, also known as the Sziklai pair, it is similar to the traditional Darlington pair except it uses complementary transistors (one npn and one pnp). The complementary Darlington is used when it is determined that output power transistors of the same type should be used (both npn or both pnp). Class AB push-pull amplifier consists of two npn output power transistors, The upper part of the push-pull configuration is a traditional Darlington, and the lower part is a complementary Darlington.
Circuit Topology
Waveforms

Input Voltage

Output Voltage
The Emitter of one transistor is connected to the Base of the other to produce a more sensitive transistor with a much larger current gain being useful in applications where current amplification or switching is required.

Darlington Transistor pairs can be made from two individually connected bipolar transistors or a one single device commercially made in a single package with the standard: Base, Emitter and Collector connecting leads and are available in a wide variety of case styles and voltage (and current) ratings in both NPN and PNP versions.
The base of the Darlington transistor is sufficiently sensitive to respond to any small input current from a switch or directly from a TTL or 5V CMOS logic gate. The maximum collector current Ic (max) for any Darlington pair is the same as that for the main switching transistor, Second transistor can be used to operate relays, DC motors, solenoids and lamps, etc.

To overcome the slow response, increased voltage drop and thermal disadvantages of a standard Darlington Transistor device, complementary NPN and PNP transistors can be used in the same cascaded arrangement to produce another type of Darlington transistor called a Sziklai Configuration.
Conclusion

- The main disadvantage of a Darlington transistor pair is the minimum voltage drop between the base and emitter when fully saturated.

- The Darlington Transistor is a high power semiconductor device with individual current and voltage ratings many times higher than a conventional small signal junction transistors.

- Thus the Darlington Class AB Push Pull Amplifier model is implemented using the Activate tool.