



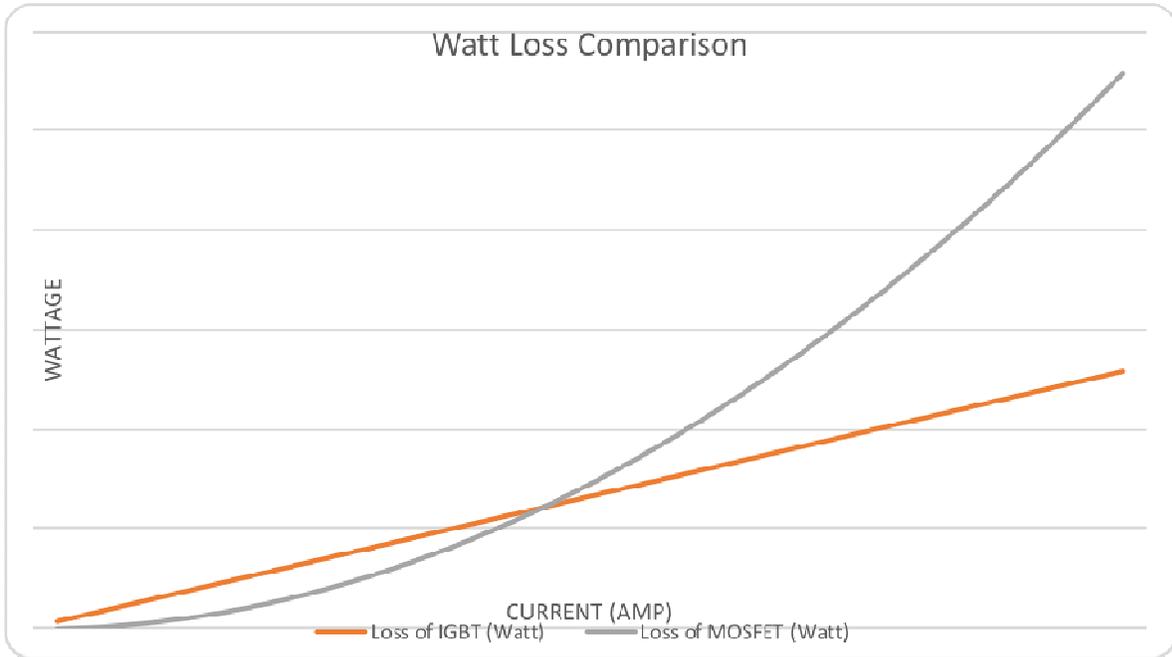
## Power Loss comparison

MOSFET Power Loss and IGBT Power losses are different.

Per table below, if current is less than 20A, MOSFET losses are less than IGBT losses.

Current (Amp)	Power Losses of IGBT (Watts)	Power Losses of MOSFET (Watts)
1	1.15	0.06
3	3.45	0.50
<b>5</b>	<b>5.75</b>	<b>1.38</b>
7	8.05	2.70
9	10.35	4.46
11	12.65	6.66
13	14.95	9.30
15	17.25	12.38
17	19.55	15.90
19	21.85	19.86
<b>21</b>	<b>24.15</b>	<b>24.26</b>
23	26.45	29.10
25	28.75	34.38
27	31.05	40.10
29	33.35	46.26
31	35.65	52.86
33	37.95	59.90
35	40.25	67.38
37	42.55	75.30
39	44.85	83.66
41	47.15	92.46
43	49.45	101.70
45	51.75	111.38

Overdrive Dimmers use MOSFET circuitry.



MOSFET losses are lower than IGBT losses until approximately 20 Amps.

**a. Power compare**

	Drain current	Drain current(pulse)	Drain-source voltage
<b>MOSFET (TK39N60W)</b>	38.8A	155A	600V
<b>IGBT (STGW50HF60SD)</b>	110A	130A	600V

IGBT continuous current can reach 110A, but MOSFET continuous current is only 38.8A

**b. MOSFET & IGBT usage in light dimming systems**

MOSFET & IGBT circuitry is far better than Triac circuitry.



## Summary

1. Major research companies like Philips and Lutron utilize MOSFET circuitry in lower amp lighting circuits. The OVERDRIVE dimmer controllers are more suitable than IGBT circuits due to the following reasons:
  - A. The power loss in MOSFET is nearly 25% of IGBT losses which means that MOSFET generates less heat, which is good for the life of the electronic system. Due to higher heat generated in IGBT circuits the heat sink on the IGBT dimmers are far larger and thus the system is more costly.
  - B. The MOSFET based controller+ dimmer uses nearly 1/4th more power compared to IGBT application circuitry. Typically if an IGBT dimmer is operating at 5 amp then the power consumed would be 5.75W (1.15V x 5 Amp) while in MOSFET the power consumption would be only 1.375 W.