

Electrical Characteristics of AC driven Light-emitting Schottky Diodes

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We propose the new type of light emitting devices which have simple metal-semiconductor-metal (MSM) structure as shown in Figure 1. The transmission line method patterned Ni/Au (50nm/100nm) Schottky contacts were formed on p-type GaN by using the thermal evaporator. The blue light emission with 467 nm wavelength was obtained from fabricated light emitter as increase of the bias voltage on metal contact. From the electroluminescence spectrum, we can know that the blue emission come from InGaN/GaN multiple quantum well(MQW) stacks. The possible mechanism of light emission can be contributed to the electron hole pairs (EHPs) generated from impact ionization effect in p-type GaN region [1, 2]. Generated EHPs were drift to InGaN/GaN MQW region and made emission of blue light by recombination with electron injected from n-GaN. We obtain bipolar current-voltage curves with double-sided luminescence. Furthermore, using these characteristics, AC driving performances will be discussed. Likewise AC driven LED without additional circuits by using bipolar current-voltage characteristics, those results might be the new way to approach optoelectronic devices through the simple fabrication and operation.

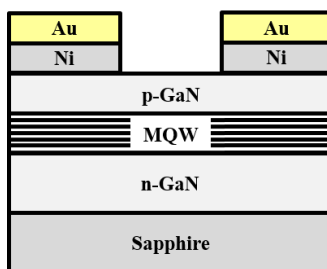


Fig. 1. Structure of Light-emitting Schottky diodes.

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References

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