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Development of high efficient plasma gun for MgO evaporation process YONG-SUP CHOI, KANGIL LEE, JINPIL KIM, SEONGHO JEONG, Production Eng. Research Lab Samsung SDI Co. Ltd., YOUNG-WOOK CHOI, Korea Electrotechnology Research Institute — MgO evaporation process is a critical process in PDP(Plasma Display Panel) manufacturing. Plasma-beam evaporation method (or ion plating method) is widely used for MgO film deposition because the plasmas activate particles in evaporation process to make MgO films dense and high quality. However, difficulty of control and deterioration of gun components by plasma make the MgO process as a neck one. To resolve the neck process, high rate and robust plasma gun is requested. The high rate could be achieved by two ways, one is to increase the gun power and the other is to improve the gun efficiency. However, gun power increase is restricted by life and breakage of PDP glass, which could be caused by heat load from the plasma. To improve gun efficiency, energy transfer mechanism of plasma gun to MgO is researched and the high efficient plasma gun is developed based on the energy transfer mechanism. Plasmas transfer their energy to MgO by mostly plasma ions, which are accelerated in sheath region in front of MgO surface. To make the gun efficient, the plasma parameters should be controlled to increase the sheath voltage. The developed high efficient gun shows higher rate and life than the existed plasma gun.

> Yong-Sup Choi Production Eng. Research Lab Samsung SDI Co. Ltd.

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