

AMENDMENT TO RULES COMMITTEE PRINT 118-

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OFFERED BY MR. PANETTA OF CALIFORNIA

At the end of subtitle D of title II, add the following:

1 **SEC. 2___.** **STUDY ON USE OF MONOLITHIC INDIUM**
2 **PHOSHPIDE SYSTEM ON CHIP PHOTONIC IN-**
3 **TEGRATED CIRCUITS IN DEFENSE AND IN-**
4 **TELLIGENCE SUPPLY CHAINS.**

5 (a) **STUDY.**—The Secretary of Defense and the Di-
6 rector of National Intelligence shall conduct study on the
7 benefits, challenges, and opportunities associated with the
8 use of monolithic indium phoshpide system on chip
9 photonic integrated circuits (referred to in this section as
10 “MInPSOCPICs”) in supply chains of the Department of
11 Defense and the intelligence community.

12 (b) **ELEMENTS.**—The study under subsection (a)
13 shall address the following:

14 (1) The potential of use of MInPSOCPICs for
15 defense and intelligence applications such as—

16 (A) secure and high-speed communications
17 networks (including satellite);

1 (B) quantum computing, sensing, and
2 communications (including quantum key dis-
3 tribution);

4 (C) artificial intelligence infrastructure
5 (intra and inter-data center and inter and
6 intra-chip);

7 (D) precision timing technologies sensors
8 (position, timing, and navigation such as short
9 and long-range Light Detection and Ranging
10 (LIDAR));

11 (E) atomic clocks; radio frequency
12 photonics (radar);

13 (F) directed energy weapons; and

14 (G) other such applications as determined
15 by the Secretary and Director.

16 (2) The benefits associated with the use of
17 MInPSOCPICs in the Department of Defense and
18 intelligence community supply chains, including ben-
19 efits with respect to power consumption, light gen-
20 eration and transmission, speed of data transfer,
21 level of integration and functional complexity, com-
22 patibility with other electronics technologies, cost,
23 size, performance (linearity, noise, signal-to-noise-
24 ratio, and output power), and reliability of
25 MInSOCPICs.

1 (3) The challenges associated with the use of
2 MInPSOCPICs in the Department of Defense and
3 intelligence community supply chains, including chal-
4 lenges relating to—

5 (A) domestic production at scale of
6 MInPSOCPICs;

7 (B) availability of domestic sources of
8 MInPSOCPICs;

9 (C) reliance on, development and use of,
10 and attempts to produce by foreign adversaries
11 related to MInPSOCPICs, heterogenous
12 photonic integrated circuits, and indium and
13 phosphide-based microelectronics generally and
14 at scale;

15 (D) ability to scale the integration of
16 MInPSOCPICs; and

17 (E) ability to integrate diverse functions
18 for critical applications on MInPSOCPICs.

19 (4) The opportunities associated with the use of
20 MInPSOCPICs in the Department of Defense and
21 intelligence community supply chains, including op-
22 portunities for new technology developments and ap-
23 plications, and heterogeneously integrated indium
24 and phosphide photonic integrated circuits for de-
25 fense and intelligence purposes.

1 (5) Potential applications of MInPSOCPICs
2 and heterogeneous integrated photonic integrated
3 circuits to support international allies and partners
4 of the United States.

5 (6) Costs associated with the development and
6 use of MInPSOCPICs and heterogeneous integrated
7 photonic integrated circuits, including—

8 (A) costs for further research and develop-
9 ment unilaterally and in conjunction with inter-
10 national allies and partners; and

11 (B) identification of the resources needed
12 to procure or develop technologies based on
13 MInPSOCPICs and heterogeneous integrated
14 photonic integrated circuits.

15 (7) Any policies, resource constraints, or tech-
16 nical challenges that limit the ability of each Sec-
17 retary of a military department and head of an intel-
18 ligence agency to develop and use MInPSOCPICS
19 and heterogeneously integrated PICs in its supply
20 chains, including an assessment of the cost related
21 to the procurement of MInPSOCPICs at scale or for
22 specialized applications.

23 (c) REPORT.—Not later than 180 days after the date
24 of the enactment of this Act, the Secretary of Defense and
25 the Director of National Intelligence shall submit to the

1 Committees on Armed Services of the Senate and the
2 House of Representatives a report on the results of the
3 Study conducted under subsection (a)

4 (d) FORM.—The report required under subsection (c)
5 shall be submitted in unclassified form, but may include
6 a classified annex.

7 (e) DEFINITIONS.—In this section:

8 (1) The term “heterogeneous photonic inte-
9 grated circuit” means a photonic integrated circuit
10 fabricated using and composed more than one base
11 element and not including silicon.

12 (2) The term “Monolithic Integrated Photonic
13 Indium Phosphide System on Chip Photonic Inte-
14 grated Circuit” means a photonic integrated circuit
15 fabricated using and composed of the base elements
16 indium and phosphide with diverse functions on such
17 circuit monolithically integrated to include a laser,
18 an modulator, detector, and optical waveguides.

19 (3) The term “photonic integrated circuit”
20 means an integrated circuit fabricated from a com-
21 pound semiconductor and containing photonic ele-
22 ments that perform analog or digital functions with
23 photons.

