

FERRITE BEAM HOPPING

Honeywell, a major international supplier of high technology microwave and electronic equipment to the space industry, designs and manufactures ultra-reliable RF switching solutions. Ferrite-based switches are used to implement high power, high speed, switching matrices used for beam hopping on telecommunication satellite payloads.

Key Features

- Very high number of switching operations
- High pulse repetition (PRF)
- Fast RF switching time
- High average power handling
- Hot switching
- Available at Ka-band and Ku-band frequencies
- Low loss

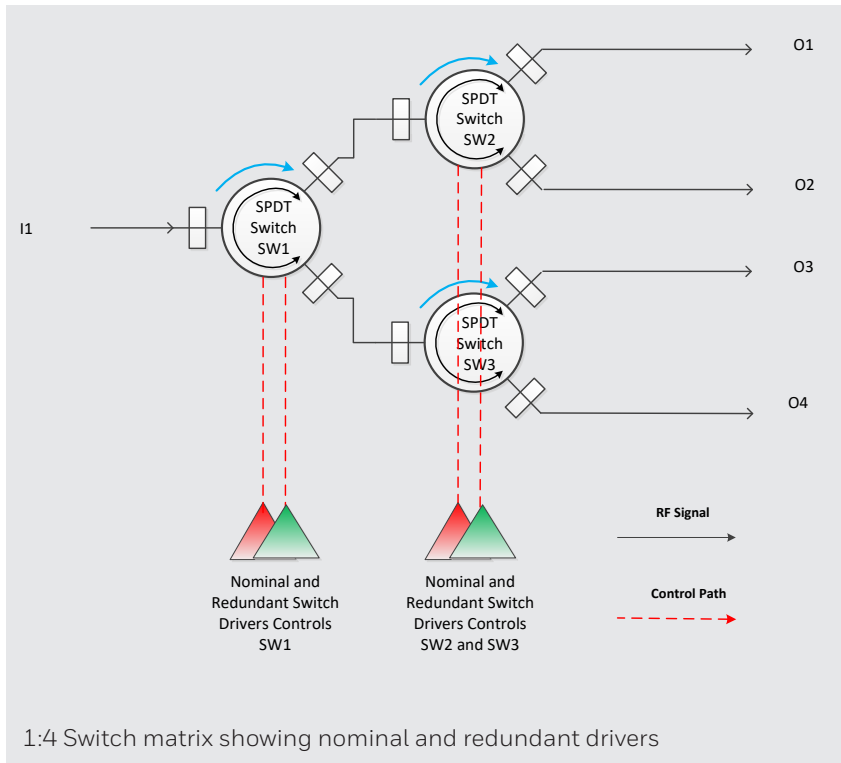
Technical Description

Beam hopping is being increasingly used on advanced telecommunication payloads to optimise throughput and coverage, and to provide enhanced flexibility for operators. The key requirements for a beam hopping front-end is the ability to switch at a high repetition rate for the lifetime of the mission, and to handle the high powers required, in addition to having low loss and high reliability. Honeywell's range of beam hopping products makes use of ferrite switches to address these challenging requirements. Unlike traditional electro-mechanical switches, ferrite switches have no moving parts and can be switched an extremely high number of times, with extremely low switching times. Combined with high power handling capability, they provide an ideal solution for beam hopping applications. Various switch matrix configurations are offered including 1:2, 1:4, 1:6, 1:8 for forward path and 2:1, 4:1, 6:1 and 8:1 for return path. The ferrite switches are controlled by electronic switch drivers which incorporate temperature compensation circuitry for stable RF performance over a wide range of temperature. Dual driver redundancy is provided for extra reliability. Single or dual redundancy power supply interfaces and complex sequencing TC/TM interfaces can be integrated into single or multiple units as required.



Beam Hopping Unit

Block Diagram of 1:16 Switch Matrix



Key Specifications

PARAMETER	VALUE
Ka-band Frequencies	17.5-21.0 GHz, 28.0-30.0 GHz
Ku-band Frequencies	10.7-12.75 GHz, 12.75-14.8 GHz
Switching operations	> 10E14
Switching Rate	20 KHz
RF Switching Time)	< 1μsec
Transmit Power Level	150 W hot switched
Insertion Loss	0.15 dB per switch level
Isolation	25 dB per switch level
Temperature Range	-20 to +50°C
Mass (1:4 plus drivers)	400g
Mass (1:8 plus drivers)	700g

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