

## PRODUCT DATASHEET

# ES-HG-S07-F14-R50

## Precision Transmission Component

Hat Harmonic Gearboxes | High-Torque Hat Unit Type I

### Product Overview

Precision Transmission Component with rated Torque 7 Nm, instantaneous Maximum Torque 46 Nm and start/Stop Peak Torque 23 Nm.

### Key Specifications

| PARAMETER                    | VALUE | UNIT    |
|------------------------------|-------|---------|
| Rated Torque                 | 7     | Nm      |
| Instantaneous Maximum Torque | 46    | Nm      |
| Start/Stop Peak Torque       | 23    | Nm      |
| Reduction Ratio              | 50    |         |
| Maximum Input Speed          | 8500  | r/min   |
| Allowable Average Torque     | 9     | Nm      |
| Backlash                     | ≤20   | arc sec |
| Frame Size                   | 14    |         |
| Weight                       | 0.4   | kg      |

## Technical Specifications

| PARAMETER                     | SPECIFICATION     | UNIT    | NOTES                                                                                                                                                                                                                                                                        |
|-------------------------------|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PERFORMANCE</b>            |                   |         |                                                                                                                                                                                                                                                                              |
| Rated Torque                  | 7                 | Nm      | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| Instantaneous Maximum Torque  | 46                | Nm      | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| Start/Stop Peak Torque        | 23                | Nm      | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| Backlash                      | ≤20               | arc sec | Reduction Ratio: 50; Size: 14; Frame Size: 14                                                                                                                                                                                                                                |
| Allowable Average Torque      | 9                 | Nm      | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| Starting Torque               | 4.5 / 0.045       | Nm      | Frame Size: 14; Reduction Ratio: 50; Size: 14 / Reduction Ratio: 50; Size: 14; Frame Size: 14                                                                                                                                                                                |
| Angular Transmission Accuracy | 1.5               | arcmin  | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| Hysteresis Loss               | 2                 | arcmin  | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| <b>MECHANICAL</b>             |                   |         |                                                                                                                                                                                                                                                                              |
| Frame Size                    | 14                |         | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                                                                                                                                                                                |
| Weight                        | 0.4               | kg      | Frame Size: 14; Reduction Ratio: 50                                                                                                                                                                                                                                          |
| Wave Generator Dimension T    | 7+0.10 / 9.4+0.10 | mm      | Frame Size: 14; Option Label: Wave generator - A φ6; Reduction Ratio: 50; Wave Generator Option: wave-generator-39713db786bd / Frame Size: 14; Option Index: 1; Option Label: Wave generator - A φ8; Reduction Ratio: 50; Wave Generator Option: wave-generator-e6e55a341aa3 |
| Wave Generator Bore U         | φ8H7 / φ6H7       |         | Frame Size: 14; Option Index: 1; Option Label: Wave generator - A φ8; Reduction Ratio: 50; Wave Generator Option: wave-generator-e6e55a341aa3 / Frame Size: 14; Option Label: Wave generator - A φ6; Reduction Ratio: 50; Wave Generator Option: wave-generator-39713db786bd |
| Wave Generator Keyway W       | 3JS9/P9 / 2JS9/P9 |         | Frame Size: 14; Option Index: 1; Option Label: Wave generator - A φ8; Reduction Ratio: 50; Wave Generator Option: wave-generator-e6e55a341aa3 / Frame Size: 14; Option Label: Wave generator - A φ6; Reduction Ratio: 50; Wave Generator Option: wave-generator-39713db786bd |

## Technical Specifications

| PARAMETER                        | SPECIFICATION               | UNIT                    | NOTES                                                                                                          |
|----------------------------------|-----------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>RELIABILITY</b>               |                             |                         |                                                                                                                |
| Design Life                      | 10000                       | h                       | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| <b>ADDITIONAL SPECIFICATIONS</b> |                             |                         |                                                                                                                |
| Reduction Ratio                  | 50                          |                         | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Maximum Input Speed              | 8500                        | r/min                   | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Average Input Speed              | 3500                        | r/min                   | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Wave Generator T                 | $7^{+0.1}_0 / 9.4^{+0.1}_0$ | mm                      | Reduction Ratio: 50; Size: 14; Frame Size: 14 / Reduction Ratio: 50; Size: 14; Frame Size: 14; Option Index: 1 |
| Wave Generator U                 | $\phi 6H7 / \phi 8H7$       |                         | Reduction Ratio: 50; Size: 14; Frame Size: 14 / Reduction Ratio: 50; Size: 14; Frame Size: 14; Option Index: 1 |
| Wave Generator W                 | 2JS9/P9 / 3JS9/P9           |                         | Reduction Ratio: 50; Size: 14; Frame Size: 14 / Reduction Ratio: 50; Size: 14; Frame Size: 14; Option Index: 1 |
| Torsional Rigidity K2            | 0.47                        | $\times 10^4$<br>Nm/rad | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Torsional Rigidity K1            | 0.34                        | $\times 10^4$<br>Nm/rad | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Torsional Rigidity K3            | 0.57                        | $\times 10^4$<br>Nm/rad | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Torsional Rigidity T2            | 6.9                         | Nm                      | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |
| Torsional Rigidity T1            | 2                           | Nm                      | Frame Size: 14; Reduction Ratio: 50; Size: 14                                                                  |

## Dimensional & Integration Overview

### Mechanical Overview

| PARAMETER                  | VALUE             | UNIT |
|----------------------------|-------------------|------|
| Frame Size                 | 14                |      |
| Weight                     | 0.4               | kg   |
| Wave Generator Dimension T | 7+0.10 / 9.4+0.10 | mm   |
| Wave Generator Bore U      | φ8H7 / φ6H7       |      |
| Wave Generator Keyway W    | 3JS9/P9 / 2JS9/P9 |      |

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**01** Specifications are subject to change without notice. Verify the current product configuration before final design release.

**02** 2D drawings, CAD files and integration documentation are controlled documents and are supplied separately on request.