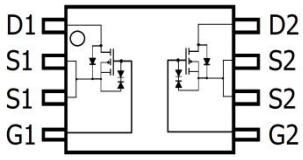
## FEATURES

- Ultra low on-resistance:$V_{DS}$=-20V,$I_D$=-4.7A,$R_{DS(ON)}$≤42mΩ@$V_{GS}$=-4.5V
- Low gate charge
- ESD protected
- Surface Mount device

**TSSOP-8**




## MECHANICAL DATA

- Case: TSSOP-8
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: not available

**MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted)**

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DS}$ | -20 | V |
| Gate-source voltage | | $V_{GS}$ | ±8 | V |
| Continuous drain current | $T_A$ = 25°C | $I_D$ | -4.7 | A |
| | $T_A$ = 70°C | | -3.7 | A |
| Pulsed drain current | | $I_{DM}$ | -30 | A |
| Power dissipation | $T_A$ = 25°C | $P_D$ | 1.4 | W |
| | $T_A$ = 70°C | | 0.9 | W |
| Thermal resistance from Junction to ambient | | $R_{\theta JA}$ | 125 | °C/W |
| Thermal resistance from Junction to Lead | | $R_{\theta JL}$ | 75 | °C/W |
| Junction temperature | | $T_J$ | 150 | °C |
| Storage temperature | | $T_{STG}$ | -55 ~+150 | °C |

**ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise specified)**

| Parameter | Symbol | Min | Typ | Max | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-Source breakdown voltage | $V_{(BR)DSS}$* | -20 | | | V | $V_{GS}$=0V, $I_D$=250μA |
| Zero gate voltage drain current | $I_{DSS}$* | | | -1 | μA | $V_{DS}$=-16V, $V_{GS}$=0V |
| Gate-body leakage current | $I_{GSS}$* | | | ±1 | μA | $V_{DS}$=0V, $V_{GS}$=±4.5V |
| | | | | ±10 | μA | $V_{DS}$=0V, $V_{GS}$=±8V |
| Gate-threshold voltage | $V_{GS(th)}$* | -0.3 | -0.55 | -1 | V | $V_{DS}$=$V_{GS}$, $I_D$=-250μA |
| On-State Drain Current | $I_{D(ON)}$* | -25 | | | A | $V_{DS}$=-5V, $V_{GS}$=-4.5V |
| Drain-source on-resistance | $R_{DS(ON)}$* | | 35 | 42 | mΩ | $V_{GS}$=-4.5V, $I_D$=-4.7A |
| | | | 47 | 57 | mΩ | $V_{GS}$=-4.5V,$I_D$=-4.7A,$T_J$=125°C |
| | | | 44 | 53 | mΩ | $V_{GS}$=-2.5V, $I_D$=-4A |
| | | | 54 | 70 | mΩ | $V_{GS}$=-1.8V, $I_D$=-2A |
| Forward transconductance | $g_{FS}$ | 8 | 16 | | S | $V_{DS}$=-5V, $I_D$=-4.7A |
| Diode forward voltage | $V_{SD}$ | | -0.78 | -1 | V | $I_S$=-1A, $V_{GS}$=0V |
| Diode forward current | $I_S$ | | | -2.2 | A | |
| Input capacitance | $C_{iss}$ | | 1450 | | pF | $V_{DS}$=-10V, $V_{GS}$=0V, f=1MHz |
| Output capacitance | $C_{oss}$ | | 205 | | pF | |
| Reverse transfer capacitance | $C_{rss}$ | | 160 | | pF | |
| Gate resistance | $R_g$ | | 6.5 | | Ω | $V_{DS}$=0V, $V_{GS}$=0V, f=1MHz |
| Total gate charge | $Q_g$ | | 17.2 | | nC | $V_{GS}$=-4.5V,$V_{DS}$=-10V,$I_D$=-4A |
| Gate-source charge | $Q_{gs}$ | | 1.3 | | nC | |
| Gate-drain charge | $Q_{gd}$ | | 4.5 | | nC | |
| Turn-on delay time | $t_{d(on)}$ | | 9.5 | | nS | $V_{GS}$=-4.5V, $V_{DS}$=-10V, $R_{GEN}$=3Ω,$R_L$=2.5Ω |
| Turn-on rise time | $t_r$ | | 17 | | nS | |
| Turn-off delay time | $t_{d(off)}$ | | 94 | | nS | |
| Turn-off fall time | $t_f$ | | 35 | | nS | |
| Body Diode Reverse Recovery Time | $t_{rr}$ | | 31 | | nS | $I_F$=-4A, dI/dt=100A/μs |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | 13.8 | | nC | $I_F$=-4A, dI/dt=100A/μs |

*Pulse test ; Pulse width ≤80μs, Duty cycle ≤ 0.5% .

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

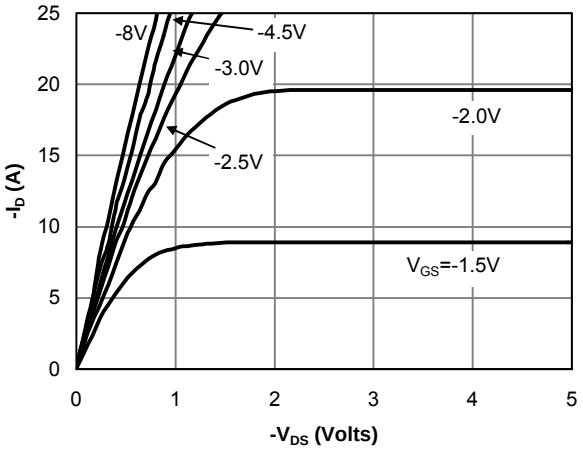



**Fig 1: On-Region Characteristics**

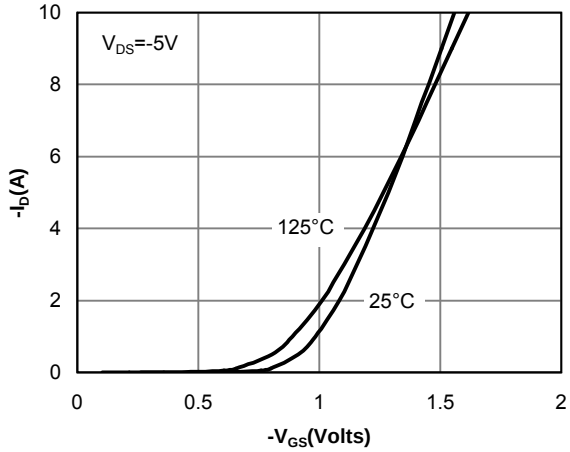



**Figure 2: Transfer Characteristics**

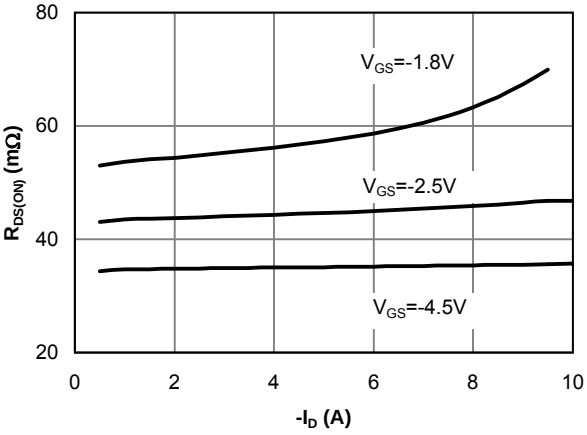



**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**

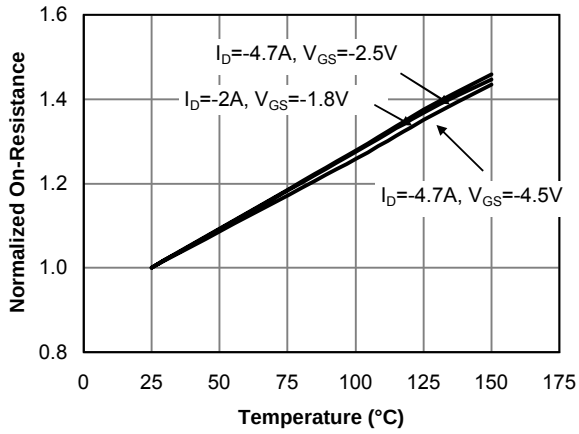



**Figure 4: On-Resistance vs. Junction Temperature**

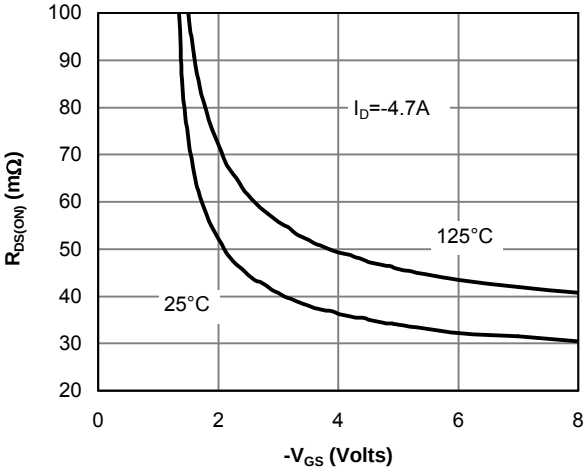



**Figure 5: On-Resistance vs. Gate-Source Voltage**

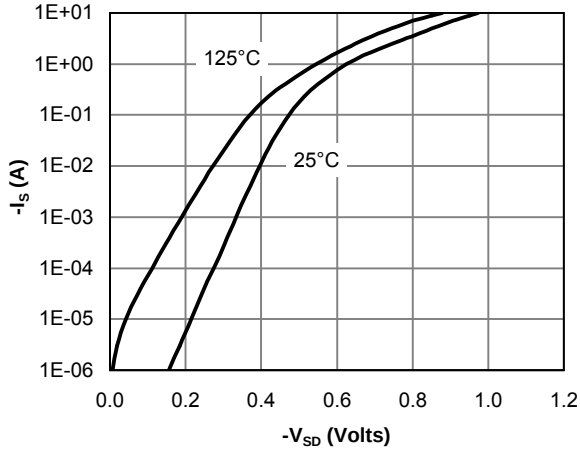



**Figure 6: Body-Diode Characteristics**

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

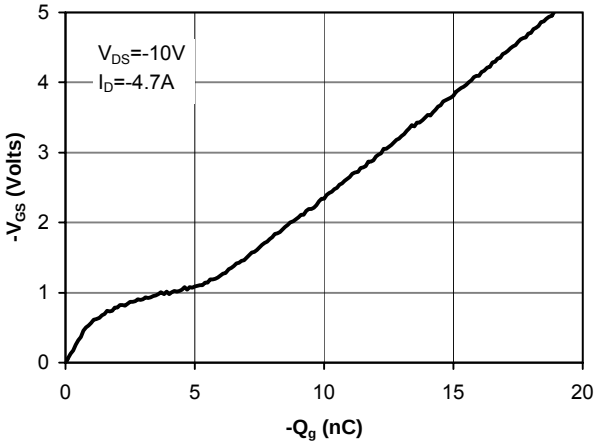



**Figure 7: Gate-Charge Characteristics**

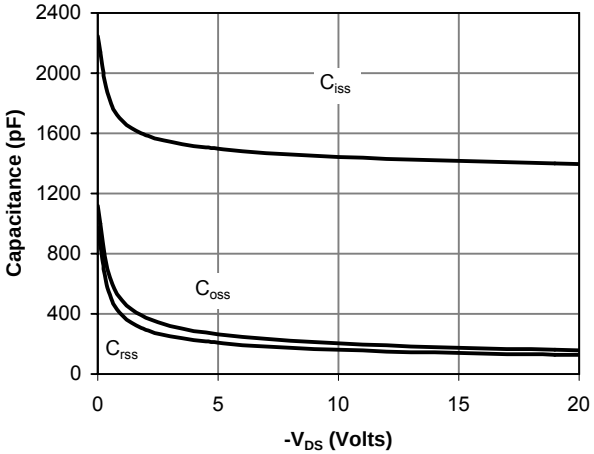



**Figure 8: Capacitance Characteristics**

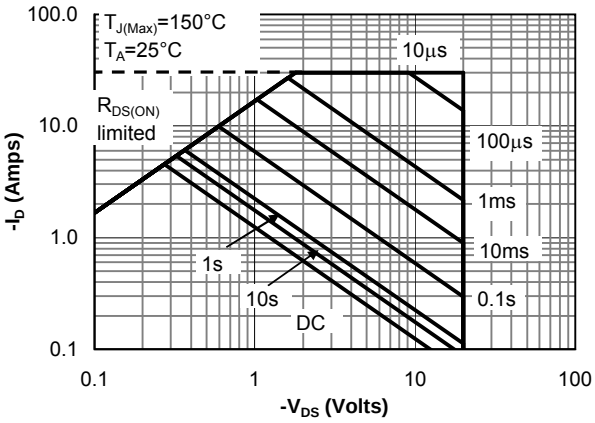



**Figure 9: Maximum Forward Biased Safe Operating Area**

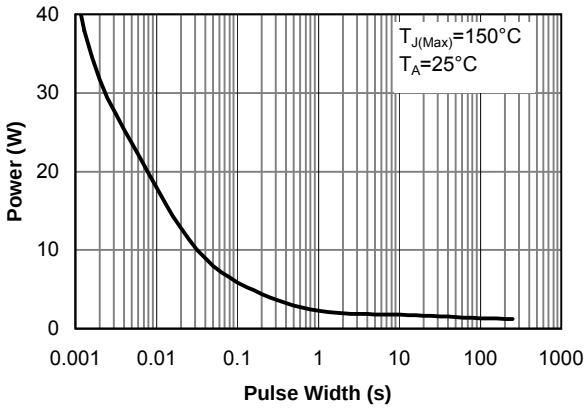



**Figure 10: Single Pulse Power Rating Junction-to-Ambient**

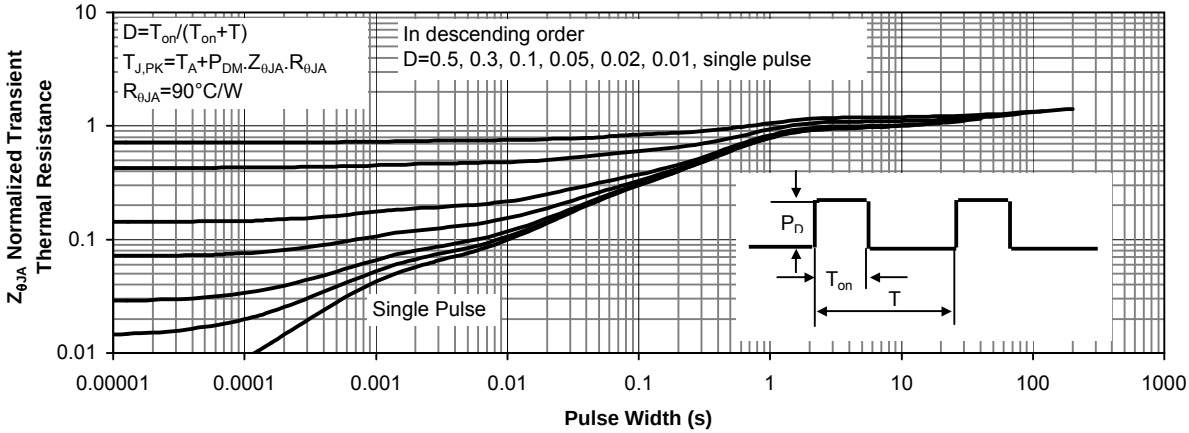
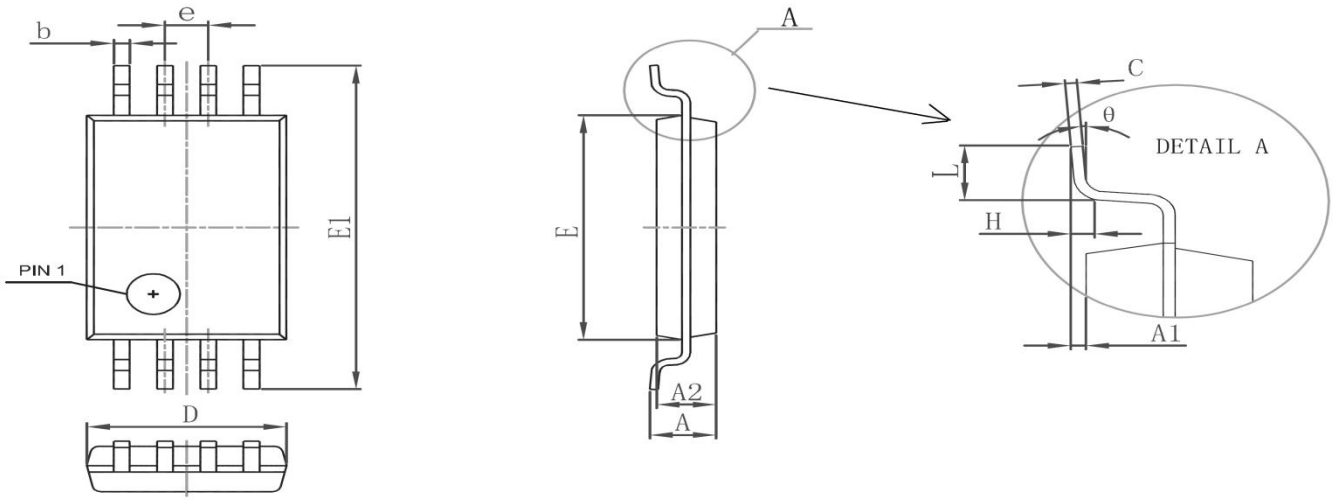


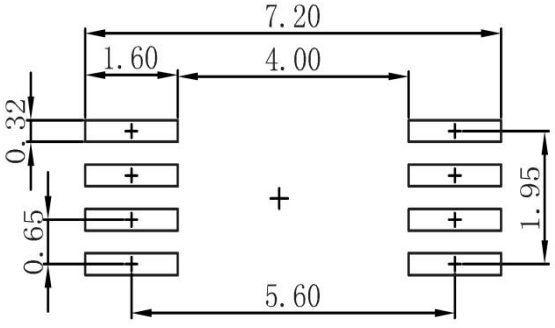

**Figure 11: Normalized Maximum Transient Thermal Impedance**

## TSSOP-8 Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 4.300 | 4.500 | 0.169 | 0.177 |
| b | 0.190 | 0.300 | 0.007 | 0.012 |
| c | 0.090 | 0.200 | 0.004 | 0.008 |
| E1 | 6.250 | 6.550 | 0.246 | 0.258 |
| A | | 1.200 | | 0.047 |
| A2 | 0.800 | 1.000 | 0.031 | 0.039 |
| A1 | 0.050 | 0.150 | 0.002 | 0.006 |
| e | 0.65(BSC) | | 0.026(BSC) | |
| L | 0.500 | 0.700 | 0.020 | 0.028 |
| H | 0.25(TYP) | | 0.01(TYP) | |
| θ | 1° | 7° | 1° | 7° |

## SOP-8 Suggested Pad Layout




**Note:**

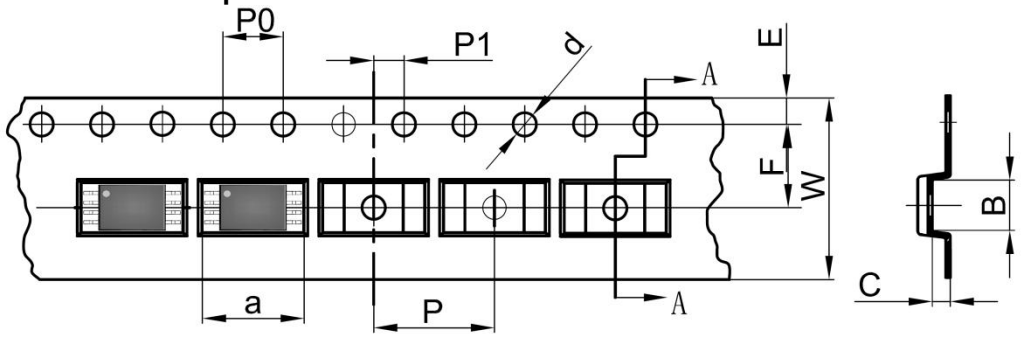
1.Controlling dimension: in millimeters

2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

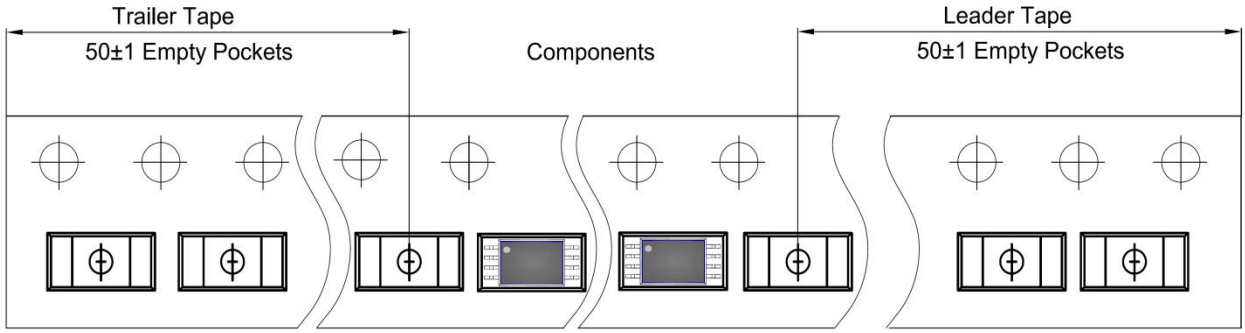
# TSSOP-8 Tape and Reel

## TSSOP-8 Embossed Carrier Tape

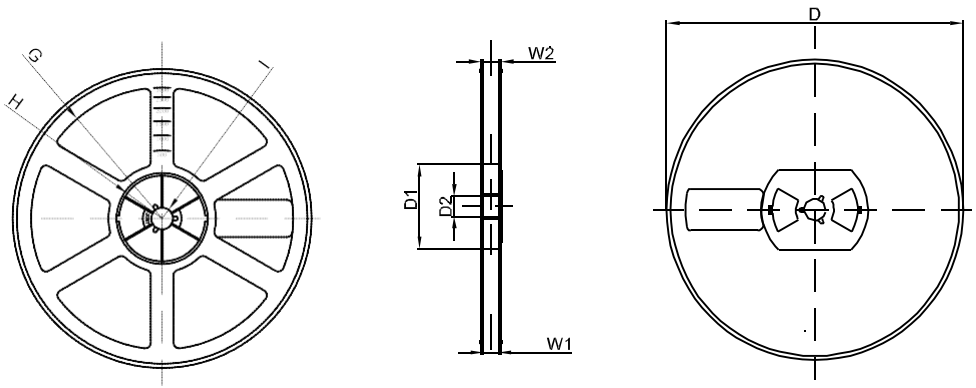



| | DIMENSIONS ARE IN MILLIMETER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| TYPE | a | B | C | d | E | F | P0 | P | P1 | W |
| SOP-8 | 6.76 | 3.30 | 1.20 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |
| TOLERANCE | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 |

## TSSOP-8 Tape Leader and Trailer




**Reel**




| | DIMENSIONS ARE IN MILLIMETER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| REEL OPTION | D | D1 | D2 | G | H | I | W1 | W2 |
| 13” DIA | Ø330.00 | 100.00 | 13.00 | R151.00 | R56.00 | R6.50 | 12.40 | 17.60 |
| TOLERANCE | ±2 | ±1 | ±1 | ±1 | ±1 | ±1 | ±1 | ±1 |