



## Description

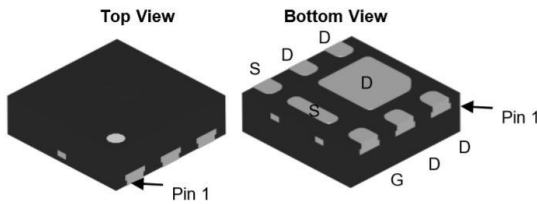
### JMT N-channel Enhancement Mode Power MOSFET

#### Features

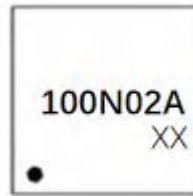
- 20V, 10A  
 $R_{DS(ON)} < 13m\Omega @ V_{GS} = 4.5V$   
 $R_{DS(ON)} < 21m\Omega @ V_{GS} = 2.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

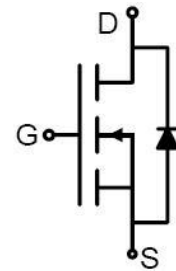
- Load Switch
- PWM Application
- Power management



DFN2020-6L



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

| Device Marking | Device      | OUTLINE | Device Package | Reel Size | Reel (PCS) | Per Carton (PCS) |
|----------------|-------------|---------|----------------|-----------|------------|------------------|
| 100N02A        | JMTV100N02A | TAPING  | DFN2020-6L     | 7inch     | 3000       | 120000           |

## Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise specified)

| Symbol          | Parameter                               | Max.                | Units        |
|-----------------|---|---------------------|--------------|
| $V_{DSS}$       | Drain-Source Voltage                    | 20                  | V            |
| $V_{GSS}$       | Gate-Source Voltage                     | $\pm 12$            | V            |
| $I_D$           | Continuous Drain Current                | $T_A = 25^\circ C$  | 10           |
|                 |   | $T_A = 100^\circ C$ | 6.5          |
| $I_{DM}$        | Pulsed Drain Current <sup>note1</sup>   | 40                  | A            |
| $P_D$           | Power Dissipation                       | $T_A = 25^\circ C$  | 2.2          |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Case    | 57                  | $^\circ C/W$ |
| $T_J, T_{STG}$  | Operating and Storage Temperature Range | -55 to +150         | $^\circ C$   |



## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol  | Parameter   | Test Condition  | Min. | Typ. | Max. | Units |
|---|---|---|------|------|------|-------|
| <b>Off Characteristic</b>                                     |   |   |      |      |      |       |
| V <sub>(BR)DSS</sub>  | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA  | 20   | -    | -    | V     |
| I <sub>DSS</sub>  | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V,  | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>  | Gate to Body Leakage Current                              | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V  | -    | -    | ±100 | nA    |
| <b>On Characteristics</b>                                     |   |   |      |      |      |       |
| V <sub>GS(th)</sub>   | Gate Threshold Voltage                                    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                    | 0.5  | 0.8  | 1.1  | V     |
| R <sub>DS(on)</sub>   | Static Drain-Source on-Resistance<br><small>note2</small> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A  | -    | 10   | 13   | mΩ    |
|   |   | V <sub>GS</sub> =2.5V, I <sub>D</sub> =5A   | -    | 15   | 21   |       |
| <b>Dynamic Characteristics</b>                                |   |   |      |      |      |       |
| C <sub>iss</sub>  | Input Capacitance   | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                      | -    | 946  | -    | pF    |
| C <sub>oss</sub>  | Output Capacitance  |   | -    | 204  | -    | pF    |
| C <sub>riss</sub>   | Reverse Transfer Capacitance                              |   | -    | 178  | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge   | V <sub>DS</sub> =10V, I <sub>D</sub> =4A,<br>V <sub>GS</sub> =4.5V                          | -    | 15   | -    | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge  |   | -    | 2    | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                               |   | -    | 5.2  | -    | nC    |
| <b>Switching Characteristics</b>                              |   |   |      |      |      |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time  | V <sub>DS</sub> =10V,<br>I <sub>D</sub> =4A, R <sub>GEN</sub> =3Ω,<br>V <sub>GS</sub> =4.5V | -    | 9    | -    | ns    |
| t <sub>r</sub>  | Turn-on Rise Time   |   | -    | 25   | -    | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                       |   | -    | 37   | -    | ns    |
| t <sub>f</sub>  | Turn-off Fall Time  |   | -    | 14   | -    | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |   |      |      |      |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current  |   | -    | -    | 10   | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current      |   | -    | -    | 40   | A     |
| V <sub>SD</sub>   | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> =10A  | -    | -    | 1.2  | V     |

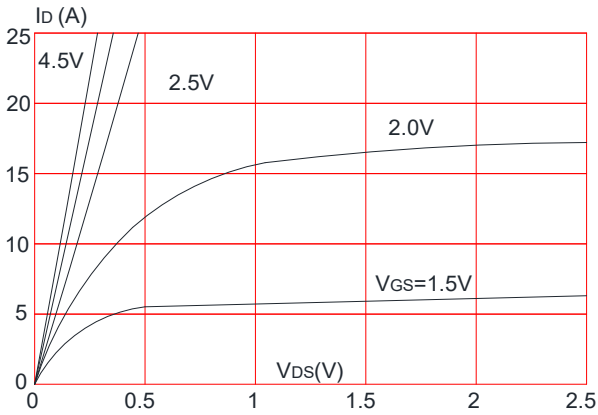
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

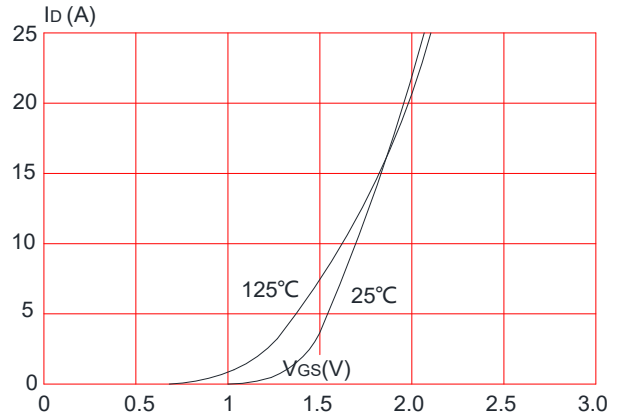


## Typical Performance Characteristics

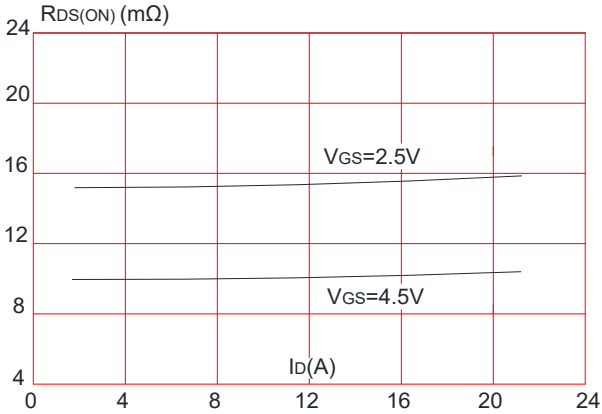
**Figure 1: Output Characteristics**



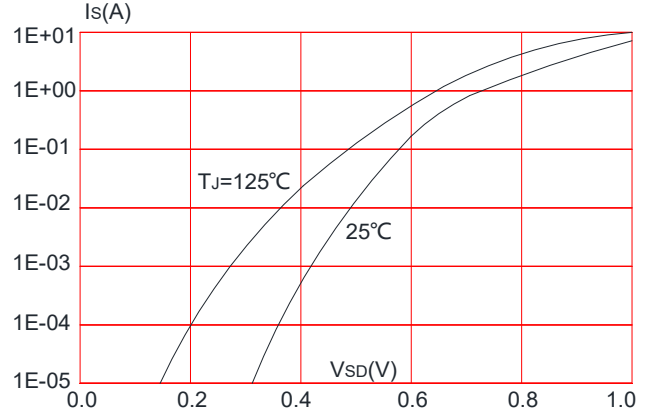
**Figure 2: Typical Transfer Characteristics**



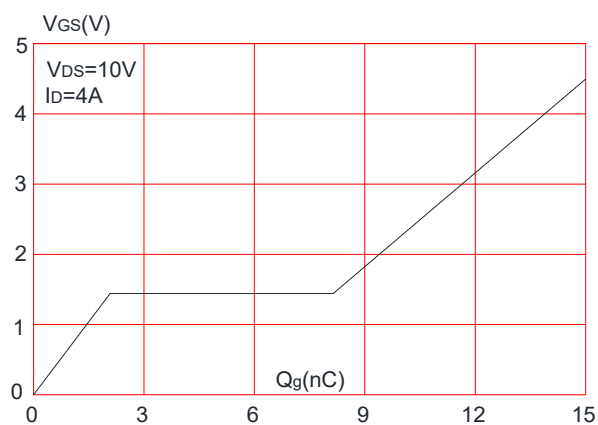
**Figure 3: On-resistance vs. Drain Current**



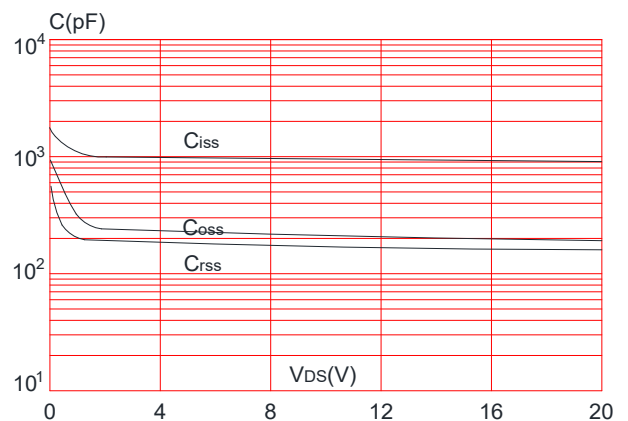
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



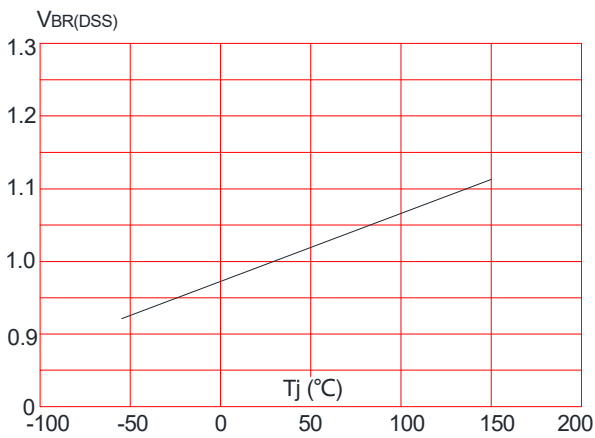
**Figure 6: Capacitance Characteristics**



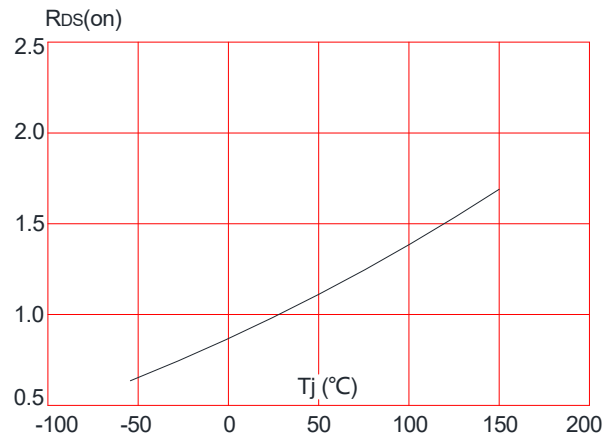


# JMTV100N02A

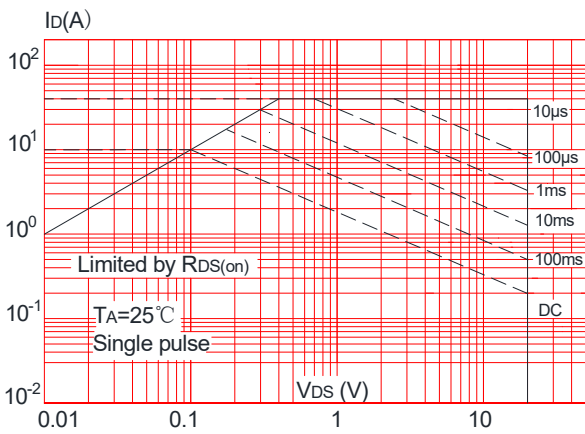
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



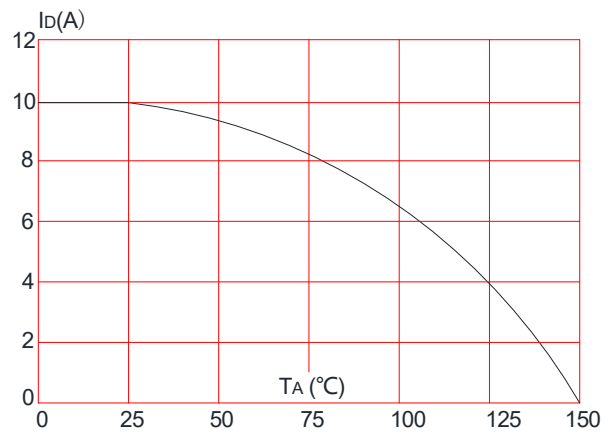
**Figure 8:** Normalized on Resistance vs. Junction Temperature



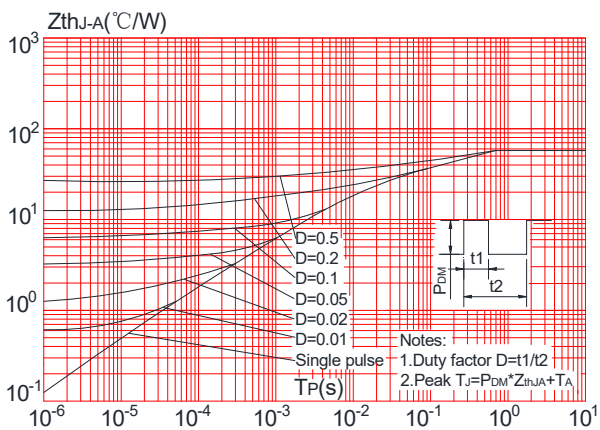
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



## Test Circuit

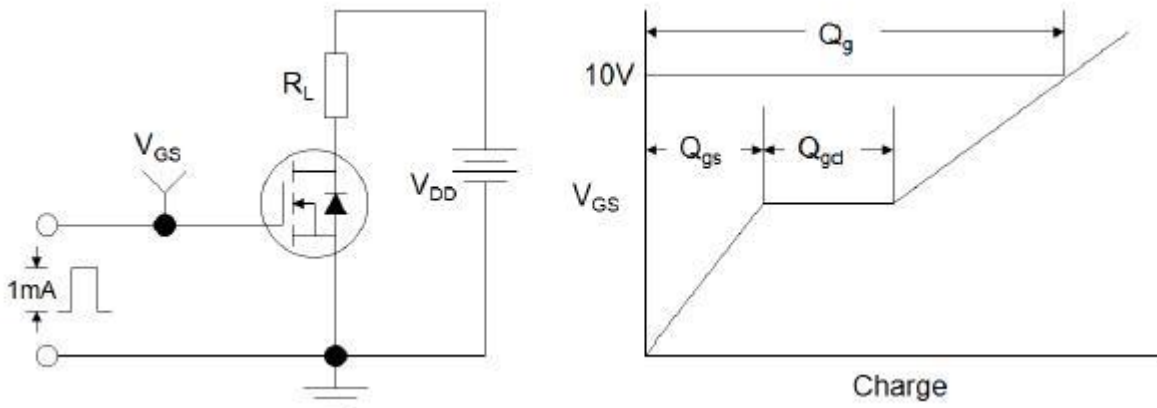


Figure1:Gate Charge Test Circuit & Waveform

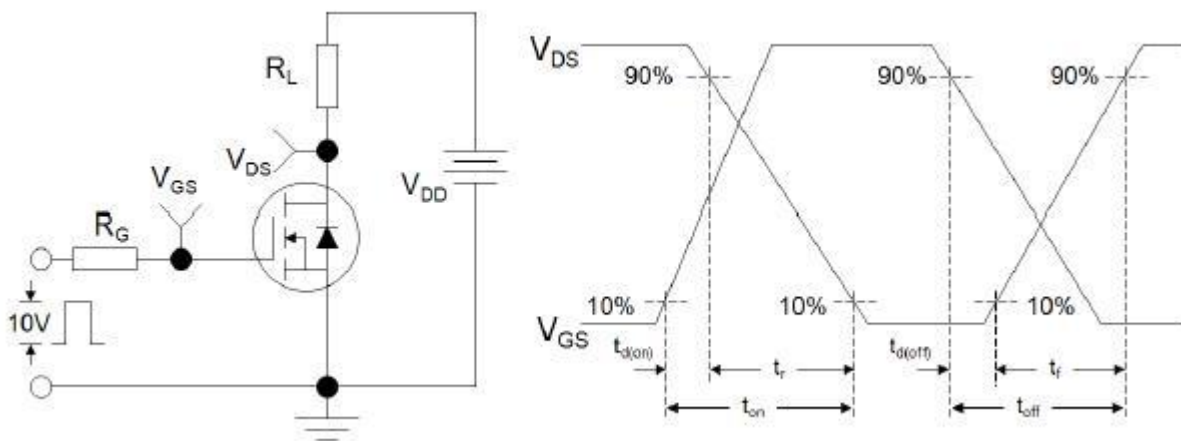


Figure 2: Resistive Switching Test Circuit & Waveforms

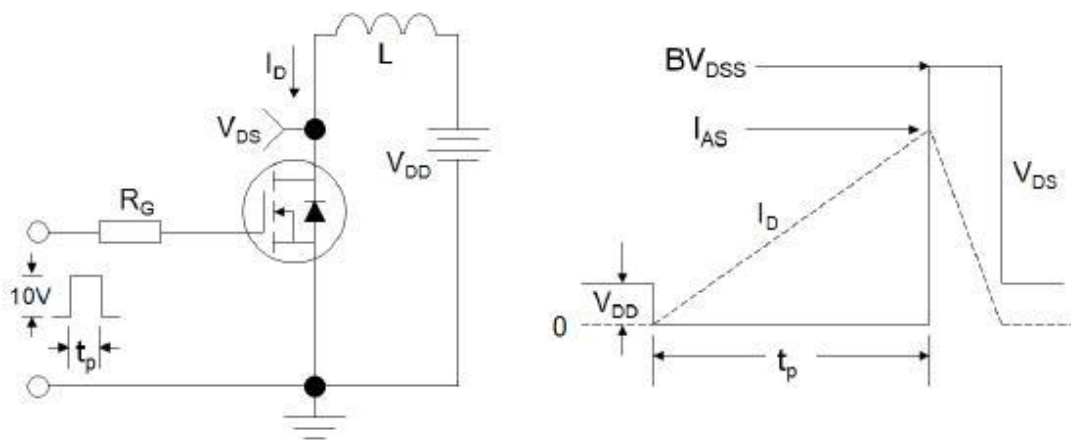
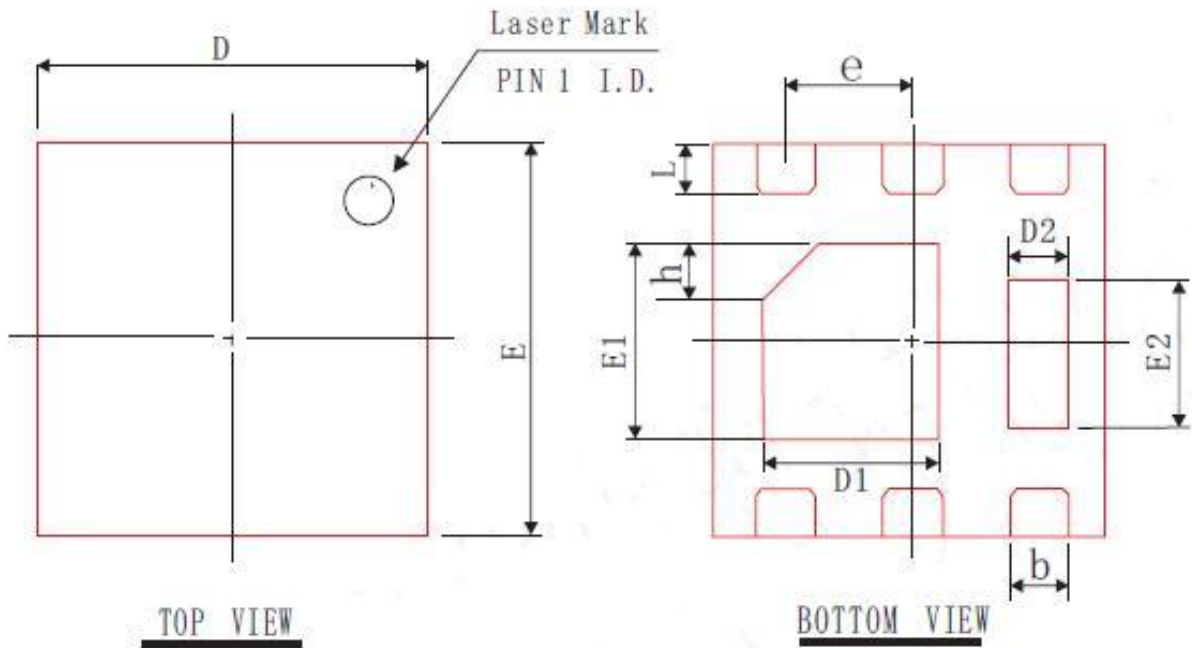


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-DFN2020-6L



COMMON DIMENSIONS  
(UNITS OF MEASURE=mm)

| SYMBOL | MIN       | NOM  | MAX  |
|--------|-----------|------|------|
| A      | 0.55      | 0.60 | 0.65 |
| A1     | 0.00      | 0.02 | 0.05 |
| b      | 0.20      | 0.25 | 0.30 |
| D      | 1.95      | 2.00 | 2.07 |
| E      | 1.95      | 2.00 | 2.07 |
| D1     | 0.80      | 0.90 | 1.00 |
| E1     | 0.90      | 1.00 | 1.10 |
| D2     | 0.20      | 0.30 | 0.40 |
| E2     | 0.65      | 0.75 | 0.85 |
| L      | 0.20      | 0.25 | 0.35 |
| h      | 0.20      | 0.25 | 0.30 |
| c      | 0.203 REF |      |      |
| e      | 0.65 BSC  |      |      |




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