

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

DMG2305UX-7-MS

Product specification

Description

The DMG2305UX-7-MS is the high cell density trench P-ch MOSFETS, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The DMG2305UX-7-MS meet the RoHS and Green Product requirement with full function reliability approved.

General Features

VDS = -20V, ID = -4A


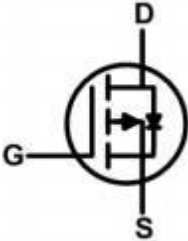

RDS(ON) < 45mΩ @ VGS=-4.5V

RDS(ON) < 63mΩ @ VGS=-2.5V

Application

- Super Low Gate Charge
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Reference News

| PACKAGE OUTLINE | P-Channel MOSFET | Marking |
|--|---|---|
|  <p data-bbox="268 1592 368 1621">SOT- 23</p> |  |  |

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|-----------|--|------------|-------|
| VDS | Drain-Source Voltage | -20 | V |
| VGS | Gate-Source Voltage | ±12 | V |
| ID@TA=25C | Continuous Drain Current, VGS @ -4.5V ¹ | -4.0 | A |
| ID@TA=70C | Continuous Drain Current, VGS @ -4.5V ¹ | -3.0 | A |
| IDM | Pulsed Drain Current ² | -16 | A |
| PD@TA=25C | Total Power Dissipation ³ | 1.31 | W |
| PD@TA=70C | Total Power Dissipation ³ | 0.84 | W |
| TSTG | Storage Temperature Range | -55 to 150 | °C |
| TJ | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|--------|---|------|------|------|
| RθJA | Thermal Resistance Junction-Ambient 1 | --- | 125 | °C/W |
| RθJA | Thermal Resistance Junction-Ambient 1 (t ≤ 10s) | --- | --- | °C/W |

Electrical Characteristics (TJ=25°C unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|--------------------------------|--|--|------|------|-------|-------|
| Off Characteristic | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D = -250μA | -20 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = -20V, V _{GS} =0V, | - | - | -1 | μA |
| I _{GSS} | Gate to Body Leakage Current | V _{DS} =0V, V _{GS} = ± 12V | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D = -250μA | -0.4 | -0.7 | -1.0 | V |
| R _{DS(on)} | Static Drain-Source on-Resistance note2 | V _{GS} = -4.5V, I _D = -4.1A | - | 35 | 45 | mΩ |
| | | V _{GS} = -2.5V, I _D = -3A | - | 43 | 63 | |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} = -10V, V _{GS} =0V, f=1.0MHz | - | 830 | - | pF |
| C _{oss} | Output Capacitance | | - | 132 | - | |
| C _{rss} | Reverse Transfer Capacitance | | - | 85 | - | |
| Q _g | Total Gate Charge | V _{DS} = -10V, I _D = -2A, V _{GS} = -4.5V | - | 8.8 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 1.4 | - | |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 1.9 | - | |

| Switching Characteristics | | | | | | |
|--|--|---|---|----|------|----|
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD} = -10V, I_D = -3.3A,$ $R_G = 1\Omega, V_{GEN} = -4.5V$ | - | 10 | - | ns |
| t_r | Turn-on Rise Time | | - | 32 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 50 | - | ns |
| t_f | Turn-off Fall Time | | - | 51 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I_S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -4.0 | A |
| I_{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -16 | A |
| V_{SD} | Drain to Source Diode Forward Voltage | $V_{GS} = 0V, I_S = -4.1A$ | - | - | -1.2 | V |

- Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

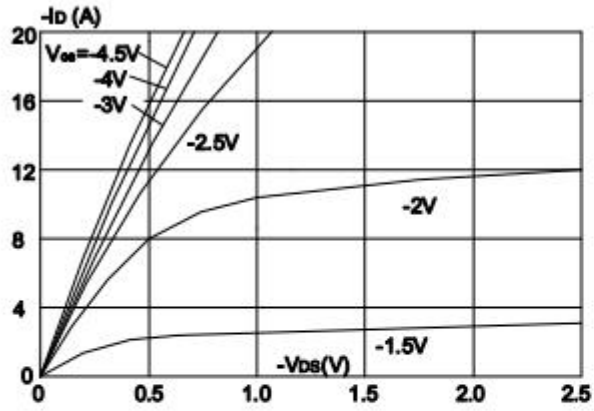


Figure 2: Typical Transfer Characteristics

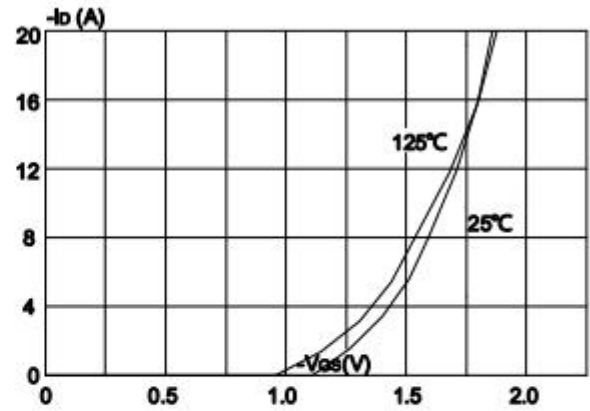


Figure 3: On-resistance vs. Drain Current

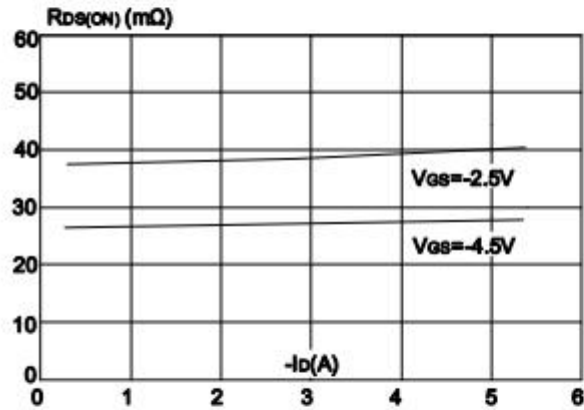


Figure 4: Body Diode Characteristics

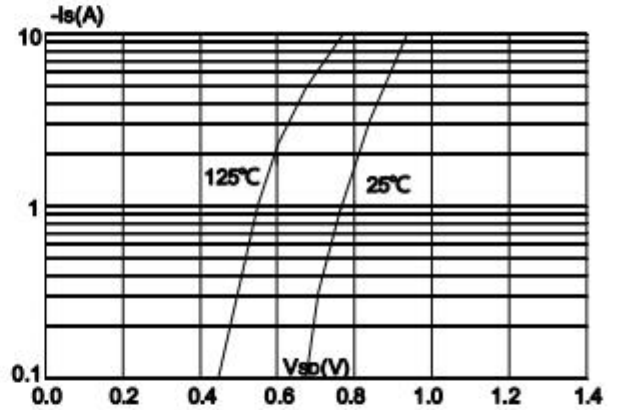


Figure 5: Gate Charge Characteristics

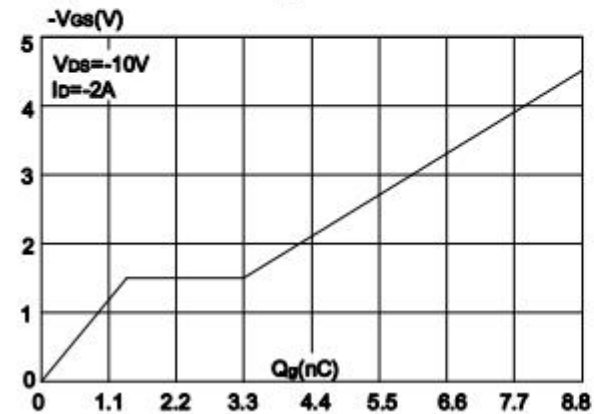


Figure 6: Capacitance Characteristics

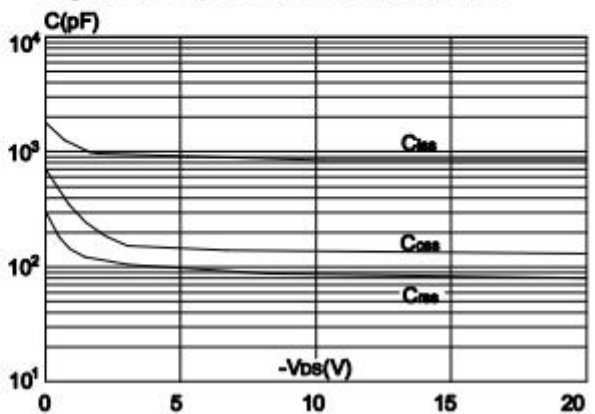


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

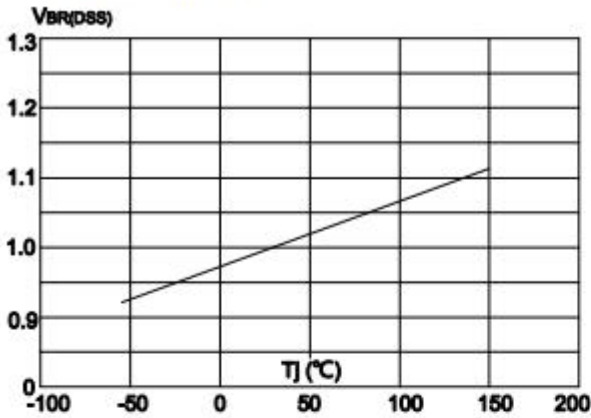


Figure 8: Normalized on Resistance vs. Junction Temperature

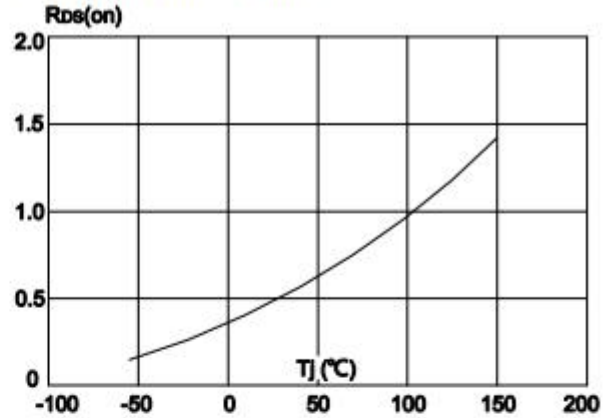


Figure 9: Maximum Safe Operating Area

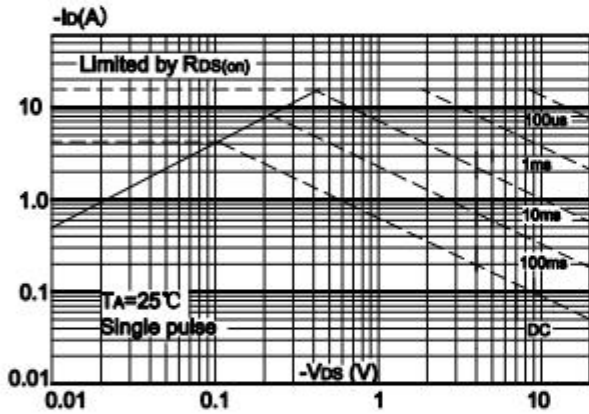


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

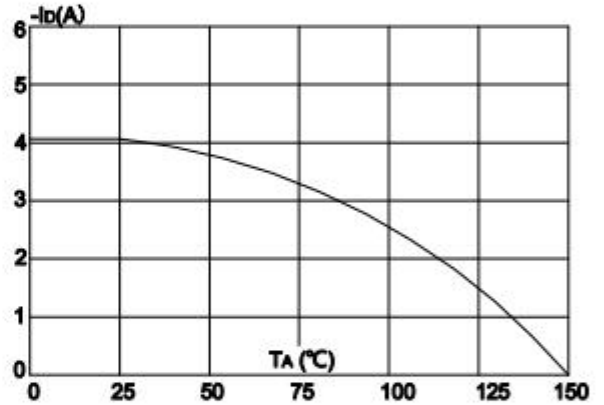
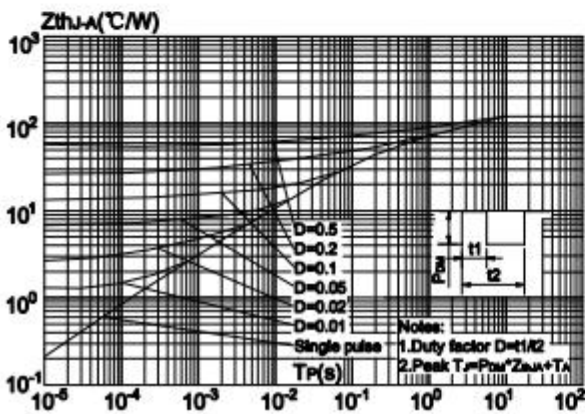
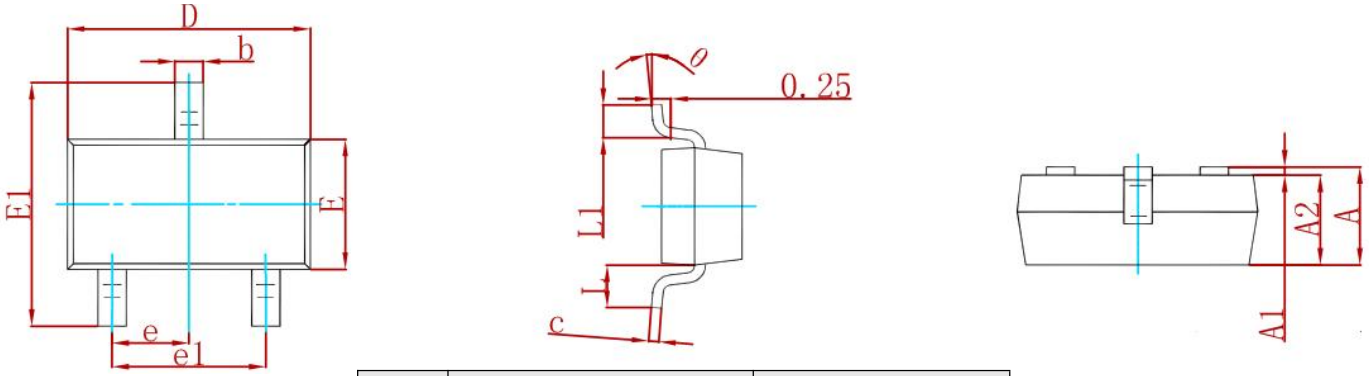


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

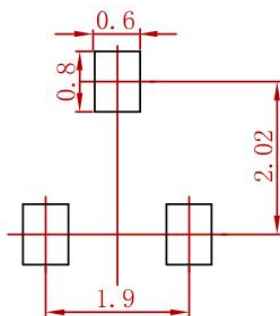


PACKAGE MECHANICAL DATA



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

Suggested Pad Layout



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05mm.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

| P/N | PKG | QTY |
|----------------|--------|------|
| DMG2305UX-7-MS | SOT-23 | 3000 |

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