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|  **JMGP500V15A**m**Description**

|  |
| --- |
| **JMG** **N-channel** **Enhancement** **Mode** **Power** **MOSFET** |
| **Features** 150V, 8ARDS(ON)< 55mΩ @ VGS =10VRDS(ON)< 66mΩ @ VGS =6V Advanced Split Gate Trench Technology Excellent RDS(ON) and Low Gate Charge Lead free product is acquired | **Application** Load Switch PWM Application Power management |  |
| *100%* *UIS* *TESTED!* *100%* *ΔVds* *TESTED!* |  |
| **SOP-8** **top** **view** | **Schematic** **Diagram****500V15A****XX****Marking** **and** **pin** **Assignment** |

**Package** **Marking** **and** **Ordering** **Information**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Device** **Marking** | **Device** | **OUTLINE** | **Device** **Package** | **Reel** **Size** | **Reel****PCS** | **Per** **Carton****(PCS)** |
| 500V15A | JMGP500V15A | TAPING | SOP-8 | 13inch | 4000 | 48000 |

**Absolute** **Maximum** **Ratings** (TA=25℃ unless otherwise specified)

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Max.** | **Units** |
| VDSS | Drain-Source Voltage | 150 | V |
| VGSS | Gate-Source Voltage | ±20 | V |
| ID | Continuous Drain Current | TA= 25℃ | 8 | A |
| TA= 100℃ | 5.2 | A |
| IDM | Pulsed Drain Current note1 | 32 | A |
| EAS | Single Pulsed Avalanche Energy note2 | 5.7 | J |
| PD | Power Dissipation | TA= 25℃ | 6 | W |
| RθJA | Thermal Resistance, Junction to Ambient | 21 | ℃/W |
| TJ , TSTG | Operating and Storage Temperature Range | -55 to +150 | ℃ |

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|  **JMGP500V15A**μnmmpppnnnn**Electrical** **Characteristics** (TJ=25℃ unless otherwise specified)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Test** **Condition** | **Min.** | **Typ.** | **Max.** | **Units** |
| **Off** **Characteristic** |
| V(BR)DSS | Drain-Source Breakdown Voltage | VGS=0V, ID=250μA | 150 | - | - | V |
| IDSS | Zero Gate Voltage Drain Current | VDS=150V, VGS=0V, | - | - | 1.0 | A |
| IGSS | Gate to Body Leakage Current | VDS=0V, VGS=±20V | - | - | ±100 | A |
| **On** **Characteristics** |
| VGS(th) | Gate Threshold Voltage | VDS=VGS , ID=250μA | 2 | 3 | 4 | V |
| RDS(on) | Static Drain-Source on-Resistance note3 | VGS=10V, ID=8A | - | 42 | 55 | Ω |
| VGS=6V, ID=5A | - | 47 | 66 | Ω |
| **Dynamic** **Characteristics** |
| Ciss | Input Capacitance | VDS=75V, VGS=0V,f=1MHz | - | 1233 | - | F |
| Coss | Output Capacitance | - | 99 | - | F |
| Crss | Reverse Transfer Capacitance | - | 5 | - | F |
| Qg | Total Gate Charge | VDS=75V, ID=8A,VGS=10V | - | 28 | - | C |
| Qgs | Gate-Source Charge | - | 7.6 | - | C |
| Qgd | Gate-Drain(“Miller”) Charge | - | 5.3 | - | C |
| **Switching** **Characteristics** |
| td(on) | Turn-on Delay Time | VDS=75V,ID=8A, RGEN=6Ω , VGS=10V | - | 14 | - | ns |
| tr | Turn-on Rise Time | - | 4.2 | - | ns |
| td(off) | Turn-off Delay Time | - | 24 | - | ns |
| tf | Turn-off Fall Time | - | 4.9 | - | ns |
| **Drain-Source** **Diode** **Characteristics** **and** **Maximum** **Ratings** |
| IS | Maximum Continuous Drain to Source Diode Forward Current | - | - | 8 | A |
| ISM | Maximum Pulsed Drain to Source Diode Forward Current | - | - | 32 | A |
| VSD | Drain to Source Diode Forward Voltage | VGS=0V, IS=8A | - | - | 1.2 | V |
| trr | Body Diode Reverse Recovery Time | IF=8A, dI/dt=100A/μs | - | 75 | - | ns |
| Qrr | Body Diode Reverse Recovery Charge | - | 109 | - | C |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature2. EAS condition: TJ=25℃, VDD=50V, VG=10V, RG=25Ω , L=0.5mH IAS=4.8A3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%**JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0**-** **2** **-** |



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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| C(pF)105104Ciss103C102101 Crss100 VDS(V)oss1086420

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  | 125℃ |  | TJ=25℃ |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  | VSD(V) |  |  |

1.0E+01 1.0E+001.0E-011.0E-021.0E-031.0E-041.0E-056050403020

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  | TJ= | 125℃ |  |
|  |  |  |  | 25℃ |
|  |  | VGS(V)  |  |  |

403020100403020100**Figure** **2:** Typical Transfer Characteristics0.0 0.2 0.4 0.6 0.8 1.0**Figure** **6:** Capacitance Characteristics0 1.5 3.0 4.5 6.0 7.5**Figure** **4**: Body Diode Characteristics0 10 20 30 40 500IS(A)ID (A)**JMGP500V15A****Typical** **Performance** **Characteristics****Figure1:** Output CharacteristicsID (A)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 610V | V | 5V |  |  |
|  |  |  |  |  |
|  |  |  |  | VGS=4.5V |
|  |  | VDS(V) |  |  |

0 2 4 6 8 1**Figure** **3:**On-resistance vs. Drain CurrentRDS(ON) (mΩ)

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | VGS=6V |  |
|  |  |  |  |
|  |  |
|  |  |
|  |  | VGS=10V |  |
|  | ID(A) |  |

0 5 10 15 20**Figure** **5:** Gate Charge CharacteristicsVGS(V)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VDS=75V ID=8A |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  | Qg(nC) |  |  |

0 6 12 18 24 30**JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0**-** **3** **-** |

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|  **JMGP500V15A** |
| **Figure** **7:** Normalized Breakdown Voltage vs. Junction TemperatureVBR(DSS) | **Figure** **8:** Normalized on Resistance vs.Junction TemperatureRDS(on) |
| 1.31.21.11.00.9000 -50 0 50 100 150 200

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
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|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  | Tj (℃) |  |  |

-1 |
| 3.252.51.751.00.25 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  | Tj (℃) |  |  |

 |
| -100 -50 0 50 100 150 200**Figure** **10:** Maximum Continuous Drain Current vs. Case Temperature |
| **Figure** **9:** Maximum Safe Operating AreaID(A) |
| 1086420 | ID(A) |
|

|  |  |
| --- | --- |
| 10210110010-110-2 | 10μs 100μs1ms10msLimited by RDS(on) 100msDCTC=25℃Single pulseVDS (V) |

 |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  | Tc (℃) |  |  |  |

 |
| 0 25 50 75 100 125 150 175 |
| 0.1 1 10 100 |
| **Figure.11:** Maximum EffectiveTransient Thermal Impedance, Junction-to-Case |
| 10-5 10-4 10-3 10-2 10-1 100 101ZthJ-C(℃/W)10-210210110010-1D=0.01Single10-6 |
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| --- |
|  **JMGP500V15A****Test** **Circuit****Figure1:Gate** **Charge** **Test** **Circuit** **&** **Waveform****Figure** **2:** **Resistive** **Switching** **Test** **Circuit** **&** **Waveforms****Figure** **3:Unclamped** **Inductive** **Switching** **Test** **Circuit** **&** **Waveforms****JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0**-** **5** **-** |

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|  **JMGP500V15A****Package** **Mechanical** **Data-SOP-8**Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Microelectronics Co.,Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu JieJie complies with the agreement.Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.This document supersedes and replaces all information previously supplied.is a registered trademark of Jiangsu JieJie Microelectronics Co.,Ltd.Copyright ©2020 Jiangsu JieJie Microelectronics Co.,Ltd. Printed All rights reserved.**JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0**-** **6** **-** |