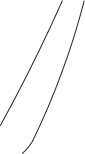
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **JMGQ065V04A**  **Description**   |  |  |  | | --- | --- | --- | | **JMG** **N-channel** **Advanced** **Mode** **Power** **MOSFET** | | | | **Features**  40V, 65A  RDS(ON)<6.5mΩ @ VGS = 10V  RDS(ON)<10.5mΩ @ VGS = 4.5V  Lead free and Green Device Available  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!* |  | | **PDFN3.3X3.3-8L** **Marking** **and** **pin** **Assignment** **Schematic** **Diagram** | | |   **Package** **Marking** **and** **Ordering** **Information**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Device** **Marking** | **Device** | **OUTLINE** | **Device** **Package** | **Reel** **Size** | **Reel** **(PCS)** | **Per** **Carton**  **(PCS)** | | Q065V04A | JMGQ065V04.A | TAPING | PDFN3.3X3.3-8L | 13inch | 5000 | 50000 |   **Absolute** **Maximum** **Ratings** (TC=25**℃** unless otherwise specified)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Symbol** | **Parameter** | | **Max.** | **Units** | | VDSS | Drain-Source Voltage | | 40 | V | | VGSS | Gate-Source Voltage | | ±20 | V | | ID | Continuous Drain Current | TC = 25**℃** | 65 | A | | TC = 100**℃** | 42 | A | | IDM | Pulsed Drain Current note1 | | 260 | A | | EAS | Single Pulsed Avalanche Energy note2 | | 85 | mJ | | PD | Power Dissipation | TC = 25**℃** | 51 | W | | RθJC | Thermal Resistance, Junction to Case | | 2.45 | **℃**/W | | TJ , TSTG | Operating and Storage Temperature Range | | -55 to +150 | **℃** |   **JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0  **-** **1** **-** |

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| **JMGQ065V04A**  **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 | 40 | - | - | V | | IDSS | Zero Gate Voltage Drain Current | VDS=40V, VGS=0V, | - | - | 1.0 | μA | | IGSS | Gate to Body Leakage Current | VDS=0V, VGS= ±20V | - | - | ±100 | nA | | **On** **Characteristics** | | | | | | | | VGS(th) | Gate Threshold Voltage | VDS=VGS , ID=250μA | 1.0 | 1.7 | 2.5 | V | | RDS(on) | Static Drain-Source on-Resistance note3 | VGS=10V, ID=15A | - | 4.5 | 6.5 | mΩ | | VGS=4.5V, ID=15A | - | 7.4 | 10.5 | | **Dynamic** **Characteristics** | | | | | | | | Ciss | Input Capacitance | VDS=20V, VGS=0V,  f=1.0MHz | - | 1094 | - | pF | | Coss | Output Capacitance | - | 412 | - | pF | | Crss | Reverse Transfer Capacitance | - | 60 | - | pF | | Qg | Total Gate Charge | VDS=32V, ID=30A,  VGS=10V | - | 24 | - | nC | | Qgs | Gate-Source Charge | - | 5 | - | nC | | Qgd | Gate-Drain(“Miller”) Charge | - | 3.5 | - | nC | | **Switching** **Characteristics** | | | | | | | | td(on) | Turn-on Delay Time | VDD=20V, ID=30A, RG=4.7Ω, VGS=10V | - | 5 | - | ns | | tr | Turn-on Rise Time | - | 24 | - | ns | | td(off) | Turn-off Delay Time | - | 35 | - | ns | | tf | Turn-off Fall Time | - | 12 | - | ns | | **Drain-Source** **Diode** **Characteristics** **and** **Maximum** **Ratings** | | | | | | | | IS | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 65 | A | | ISM | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 260 | A | | VSD | Drain to Source Diode Forward Voltage | VGS=0V, IS=30A | - | - | 1.2 | V | | trr | Body Diode Reverse Recovery Time | TJ=25**℃** ,  IF=30A,dI/dt=100A/μs | - | 9 | - | ns | | Qrr | Body Diode Reverse Recovery Charge | - | 15 | - | nC |   Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature  2. EAS condition: TJ=25**℃** , VDD=20V, VG=10V, RG=25Ω, L=0.5mH, IAS=18.5A  3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%  **JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0  **-** **2** **-** |



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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | VDS=20V ID=30A |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  | Qg(nC) |  |  |   VGS(V)  10  8  6  4  2  0   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | |  |  |  |  |  | |  |  |  | |  | |  |  |  |  |  | |  |  | VGS(V) |  |  |   100  80  60  40  20  0  100  80  60  40  20  0   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |  |  | VGS=4.5V |  | |  |  |  |  | |  |  | VGS=10V |  | |  |  | |  |  |  |  | |  | ID(A) | |  |   1.0E+01  1.0E+00  1.0E-01  1.0E-02  1.0E-03  1.0E-04  1.0E-05  12  10  8  6  4  2  0  **Figure1:** Output Characteristics  0 5 10 15 20  **Figure** **5:** Gate Charge Characteristics  0 1.0 2.0 3.0 4.0 5.0  **Figure** **4**: Body Diode Characteristics  0 5 10 15 20 25  IS(A)  ID (A)  TJ=125℃  25℃  **JMGQ065V04A**  **Typical** **Performance** **Characteristics**  **Figure** **2:** Typical Transfer Characteristics  ID (A)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | 10V | 4.5V |  |  |  | |  |  | 4V |  |  | |  |  |  |  |  | |  |  |  |  | VGS=2.5V | |  |  |  | |  |  | VDS(V) |  |  |   0 1 2 3 4 5  **Figure** **3:**On-resistance vs. Drain Current  RDS(ON) (mΩ)   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | |  |  |  |  |  | |  | 125℃ |  | TJ=25℃ |  | |  |  |  |  |  | |  |  |  |  |  | |  |  | VSD(V) |  |  |   0.0 0.2 0.4 0.6 0.8 1.0  **Figure** **6:** Capacitance Characteristics  C(pF)  105  104  Ciss  103  102  101  Coss Crss  VDS(V)  0 5 10 15 20 25  **JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0  **-** **3** **-** |

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| **Figure** **7:** Normalized Breakdown Voltage vs.  Junction Temperature  VBR(DSS) | **Figure** **8:** Normalized on Resistance vs.  Junction Temperature  RDS(on) | | |
| 2.5  2.0  1.5  1.0  0.5 | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  | Tj (℃) | |  |  | | |
| 0.9  1.3  1.2  1.1  1.0  0   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  | Tj (℃) | |  |  |   -100 -50 0 50 100 150 200 |
| -100 -50 0 50 100 150 200  **Figure** **10:** Maximum Continuous Drain Current vs. Case Temperature | | |
| **Figure** **9:** Maximum Safe Operating Area  ID(A**)** |
| 78  65  52  39  26  13  0 | | ID(A**)** |
| |  |  | | --- | --- | | 103  102  101  100  10-1 | Limited by RDS(on)  10μs  100μs  1ms  10ms  100ms  DC  TC=25**℃**  Single pulse  VDS (V) | |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  | Tc (℃) |  |  |  | |
| 0.1 1 10 100 |
| 0 25 50 75 100 125 150 175 | | |
| **Figure.11:** Maximum Effective  Transient Thermal Impedance, Junction-to-Case | | | |
| ZthJ-C(**℃**/W)  PDM  10-6  t1 t2  10-2  10-3  101  100  10-1  D=0.5  D=0.2  D=0.1  D=0.05  D=0.02  Notes:  TP  10-5 10-4 10-3 10-2 10-1 100 101 | | | |
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| **JMGQ065V04A**  **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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| **JMGQ065V04A**  **Package** **Mechanical** **Data-** **PDFN3.3X3.3-8L**    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.  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** **-** |