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|  **JMGQ065V04A****Description**

|  |
| --- |
| **JMG** **N-channel** **Advanced** **Mode** **Power** **MOSFET** |
| **Features** 40V, 65ARDS(ON)<6.5mΩ @ VGS = 10VRDS(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 | **℃** |

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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 Temperature2. EAS condition: TJ=25**℃** , VDD=20V, VG=10V, RG=25Ω, L=0.5mH, IAS=18.5A3. 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 |  |  |  |  |
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|  |  | Qg(nC) |  |  |

VGS(V)1086420

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|  |  | VGS(V) |  |  |

100806040200100806040200

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| --- | --- | --- | --- |
|  |  |  |  |
|  |  | VGS=4.5V |  |
|  |  |  |  |
|  |  | VGS=10V |  |
|  |  |
|  |  |  |  |
|  | ID(A) |  |

1.0E+011.0E+001.0E-011.0E-021.0E-031.0E-041.0E-05121086420**Figure1:** Output Characteristics0 5 10 15 20**Figure** **5:** Gate Charge Characteristics0 1.0 2.0 3.0 4.0 5.0**Figure** **4**: Body Diode Characteristics0 5 10 15 20 25IS(A)ID (A)TJ=125℃25℃**JMGQ065V04A****Typical** **Performance** **Characteristics****Figure** **2:** Typical Transfer CharacteristicsID (A)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 10V | 4.5V |  |  |  |
|  |  | 4V |  |  |
|  |  |  |  |  |
|  |  |  |  | VGS=2.5V |
|  |  |  |
|  |  | VDS(V) |  |  |

0 1 2 3 4 5**Figure** **3:**On-resistance vs. Drain CurrentRDS(ON) (mΩ)

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

0.0 0.2 0.4 0.6 0.8 1.0**Figure** **6:** Capacitance CharacteristicsC(pF)105104Ciss103102101Coss CrssVDS(V)0 5 10 15 20 25**JieJie** **Microelectronics** **CO.** **,** **Ltd** Version :1.0**-** **3** **-** |

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|  **JMGQ065V04A** |
| **Figure** **7:** Normalized Breakdown Voltage vs.Junction TemperatureVBR(DSS) | **Figure** **8:** Normalized on Resistance vs.Junction TemperatureRDS(on) |
| 2.52.01.51.00.5 |

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

 |
| 0.91.31.21.11.00

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|  |  |  |  |  |  |
|  |  | 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 AreaID(A**)** |
| 7865523926130 | ID(A**)** |
|

|  |  |
| --- | --- |
| 10310210110010-1 | Limited by RDS(on)10μs100μs1ms10ms100msDCTC=25**℃**Single pulseVDS (V) |

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

 |
| 0.1 1 10 100 |
| 0 25 50 75 100 125 150 175 |
| **Figure.11:** Maximum EffectiveTransient Thermal Impedance, Junction-to-Case |
| ZthJ-C(**℃**/W)PDM10-6t1 t210-210-310110010-1D=0.5D=0.2D=0.1D=0.05D=0.02Notes:TP10-5 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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