## Features

- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% $R_g$ Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

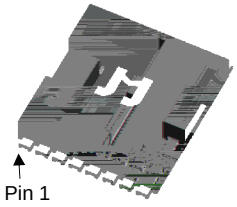
## Product Summary

| | Value | Unit |
|---|---|---|
| | 150 | V |
| | 3.2 | V |
| | 263 | A |
| | 3.3 | mΩ |

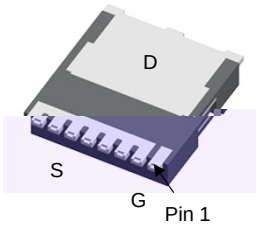
## Applications

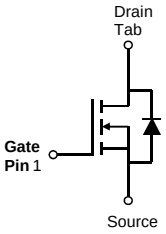
- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

**PowerJE®10x12 Top**




PowerJE®10x12 Bottom



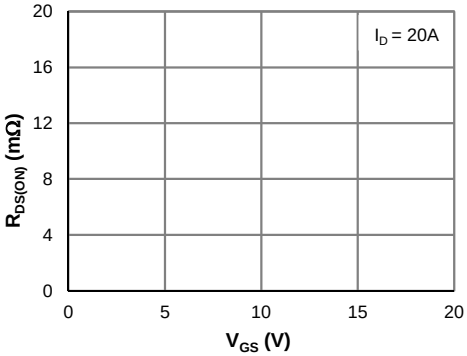

| | Package | # of Pins | Marking | MSL | $T_J$ (°C) | Media | Quantity (pcs) |
|---|---|---|---|---|---|---|---|
| JMSH1504ATL-13 | PowerJE®10x12 (1) | 8 | SH1504A | 1 | -55 to 175 | 13-inch Reel | 2000 |

Note 1: PowerJE® is a registered trademark of JieJie Micro., its package outline is compatible to that of TO-LeadLess (TOLL).

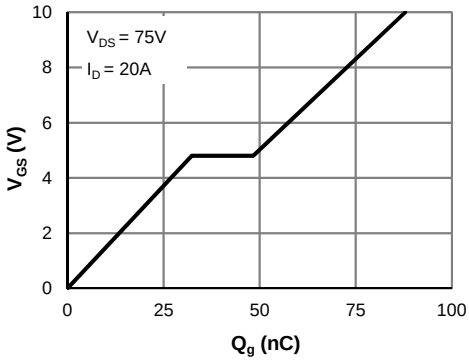
## Absolute Maximum Ratings (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| | | $V_{DS}$ | | V |
| | | $V_{GS}$ | | V |
| | | $I_D$ | **263** | |
| | **$T_C$ = 100°C** | | **186** | |
| **Pulsed Drain Current (3)** | | $I_{DM}$ | **817** | A |
| **Avalanche Current (4)** | | $I_{AS}$ | **49** | A |
| **Avalanche Energy (4)** | | $E_{AS}$ | **1201** | mJ |
| **Power Dissipation (5)** | **$T_C$ = 25°C** | **$P_D$** | **600** | **W** |
| | **$T_C$ = 100°C** | | **300** | |
| **Junction & Storage Temperature Range** | | $T_J$, $T_{STG}$ | **-55 to 175** | °C |

**$R_{DS(ON)}$ vs. $V_{GS}$**




**Gate Charge**



## Electrical Characteristics (@ $T_J$ = 25°C unless otherwise specified)

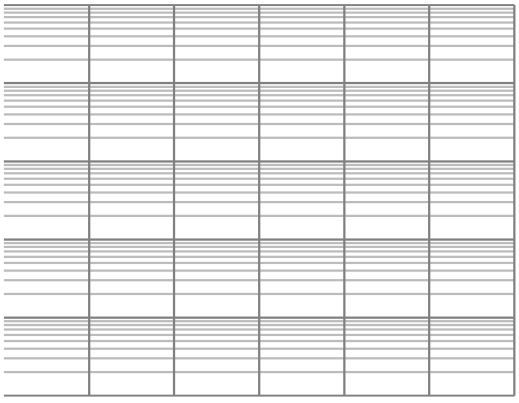
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **STATIC PARAMETERS** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$ = 250μA, $V_{GS}$ = 0V | 150 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 120V, $V_{GS}$ = 0V | | | 1.0 | μA |
| | | $T_J$ = 55°C | | | 5.0 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 2.5 | 3.2 | 4.5 | V |
| Static Drain-Source ON-Resistance | $R_{DS(ON)}$ | | | 3.3 | 4.2 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 5V, $I_D$ = 20A | | 65 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$ = 1A, $V_{GS}$ = 0V | | 0.71 | 1.0 | V |
| Diode Continuous Current | $I_S$ | | | | 600 | A |
| | | | | | | |
| | $C_{iss}$ | | | 6540 | | pF |
| | $C_{oss}$ | | | 772 | | pF |
| | $C_{rss}$ | | | 6.7 | | pF |
| Gate Resistance | $R_g$ | $V_{GS}$ = 0V, $V_{DS}$= 0V, f = 1MHz | | 2.4 | | Ω |
| | | | | | | |
| Total Gate Charge (@ $V_{GS}$ = 10V) | $Q_g$ | | | 88 | | nC |
| Total Gate Charge (@ $V_{GS}$ = 6.0V) | $Q_g$ | $V_{GS}$ = 0 to 10V | | 57 | | nC |
| Gate Source Charge | $Q_{gs}$ | $V_{DS}$ = 75V, $I_D$ = 20A | | 32 | | nC |
| Gate Drain Charge | $Q_{gd}$ | | | 16 | | nC |
| Turn-On DelayTime | $t_{D(on)}$ | | | 48 | | ns |
| Turn-On Rise Time | $t_r$ | $V_{GS}$ = 10V, $V_{DS}$ = 75V | | 90 | | ns |
| Turn-Off DelayTime | $t_{D(off)}$ | $R_L$ = 3.75Ω, $R_{GEN}$ = 6Ω | | 94 | | ns |
| Turn-Off Fall Time | $t_f$ | | | 60 | | ns |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$ = 15A, $dI_F/dt$ = 100A/μs | | 122 | | ns |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | | 279 | | nC |

| | Symbol | | | Unit |
|---|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 45 | 55 | °C/W |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | | 0.25 | °C/W |

**Notes:**

2. Computed continuous current assumes the condition of $T_{J\_Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design.

**Typical Electrical & Thermal Characteristics**



## Typical Electrical & Thermal Characteristics

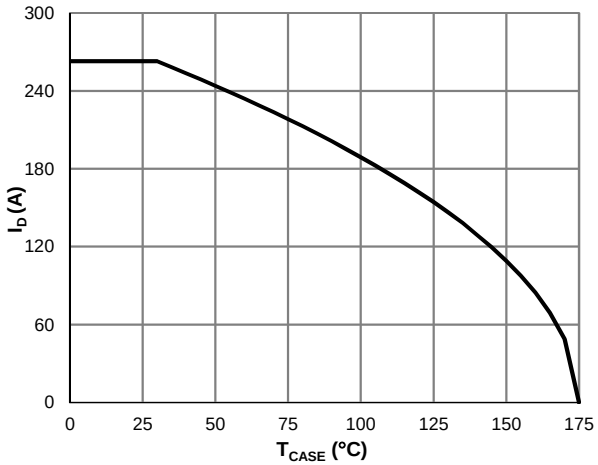



**Figure 7: Current De-rating**

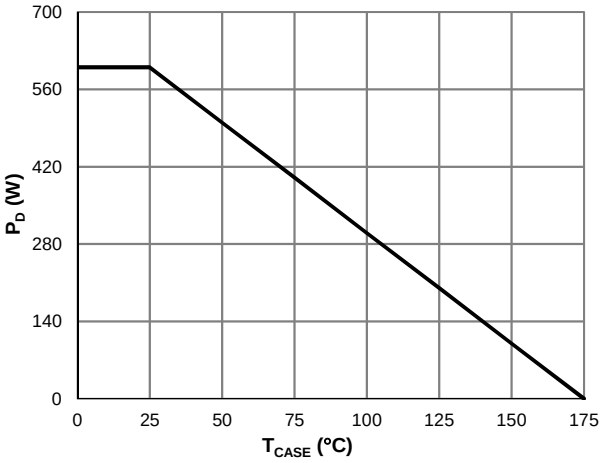



**Figure 8: Power De-rating**

## PowerJE®10x12 Package Information

| DIM. | MILLIMETER | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 2.20 | 2.30 | 2.40 |
| b | 0.70 | 0.80 | 0.90 |
| b1 | 9.70 | 9.80 | 9.90 |
| b2 | 0.42 | 0.46 | 0.50 |
| c | 0.40 | 0.50 | 0.60 |
| D | 10.28 | 10.38 | 10.58 |
| D2 | | 3.30 | |
| E | 9.70 | 9.90 | 10.10 |