



PJU8NA65A / PJD8NA65A / PJP8NA65A / PJF8NA65A

650V N-Channel MOSFET

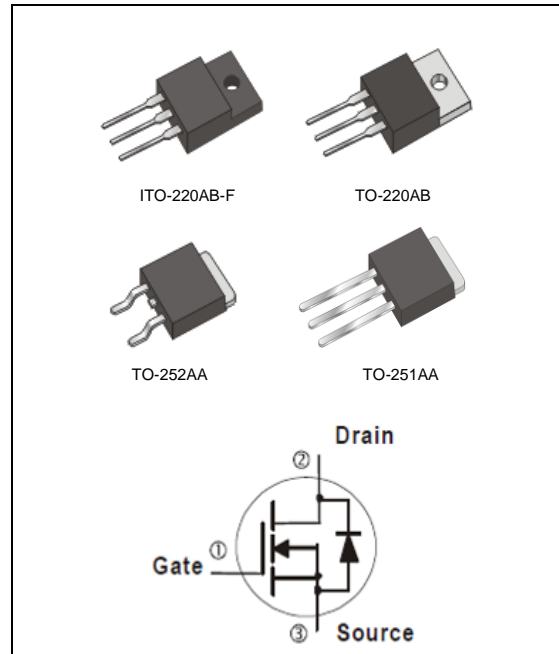
| | | | |
|----------------|--------------|----------------|--------------|
| Voltage | 650 V | Current | 7.5 A |
|----------------|--------------|----------------|--------------|

Features

- $R_{DS(ON)}$, $V_{GS}@10V, I_D@3.75A < 1.2\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std. (Halogen Free)

Mechanical Data

- Case: TO-251AA, ,TO-252AA ,TO-220AB, ITO-220AB-F Package
- Terminals : Solderable per MIL-STD-750, Method 2026



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | | SYMBOL | TO-251AA | TO-220AB | ITO-220AB-F | TO-252AA | UNITS |
|---|---------------------------------|-----------------|----------|----------|-------------|----------|---------------------------|
| Drain-Source Voltage | | V_{DS} | 650 | | | | V |
| Gate-Source Voltage | | V_{GS} | ±30 | | | | V |
| Continuous Drain Current | | I_D | 7.5 | | | | A |
| Pulsed Drain Current | | I_{DM} | 30 | | | | A |
| Single Pulse Avalanche Energy ^(Note 1) | | E_{AS} | 245 | | | | mJ |
| Power Dissipation | $T_C=25^\circ\text{C}$ | P_D | 140 | 145 | 46 | 140 | W |
| | Derate above 25°C | | 1.12 | 1.16 | 0.37 | 1.12 | W/ $^\circ\text{C}$ |
| Operating Junction and Storage Temperature Range | | T_J, T_{STG} | -55~150 | | | | $^\circ\text{C}$ |
| Typical Thermal Resistance | | | | | | | |
| - Junction to Case | | $R_{\theta JC}$ | 0.89 | 0.88 | 2.72 | 0.89 | $^\circ\text{C}/\text{W}$ |
| - Junction to Ambient | | $R_{\theta JA}$ | 110 | 62.5 | 120 | 110 | |

- Limited only By Maximum Junction Temperature



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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---|--------------|---|------|------|-----------|----------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 650 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | 2.89 | 4 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=3.75A$ | - | 0.91 | 1.2 | Ω |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=650V, V_{GS}=0V$ | - | - | 1.0 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 30V, V_{DS}=0V$ | - | - | ± 100 | nA |
| Diode Forward Voltage | V_{SD} | $I_S=7.5A, V_{GS}=0V$ | - | 0.9 | 1.4 | V |
| Dynamic (Note 4) | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=520V, I_D=7.5A,$ $V_{GS}=10V$ (Note 2,3) | - | 29 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 5.5 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 9.7 | - | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHZ}$ | - | 1245 | - | pF |
| Output Capacitance | C_{oss} | | - | 105 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 50 | - | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=325V, I_D=7.5A,$ $R_G=25\Omega$ (Note 2,3) | - | 15 | - | ns |
| Turn-On Rise Time | t_r | | - | 27 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 92 | - | |
| Turn-Off Fall Time | t_f | | - | 36 | - | |
| Drain-Source Diode | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | --- | - | - | 7.5 | A |
| Maximum Pulsed Drain-Source Diode Forward Current | I_{SM} | --- | - | - | 30 | A |
| Reverse Recovery Time | t_{rr} | $V_{GS}=0V, I_S=7.5A$ | - | 360 | - | ns |
| Reverse Recovery Charge | Q_{rr} | $di_F/dt=100A/\mu s$ (Note 2) | - | 3.31 | - | μC |

NOTES :

1. $L=10\text{mH}, I_{AS}=7A, V_{DD}=50V, R_G=25\text{ohm},$ Starting $T_J=25^\circ\text{C}$
2. Pulse width $\leq 300\mu s,$ Duty cycle $\leq 2\%$
3. Essentially independent of operating temperature typical characteristics.
4. Guaranteed by design, not subject to production testing



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TYPICAL CHARACTERISTIC CURVES

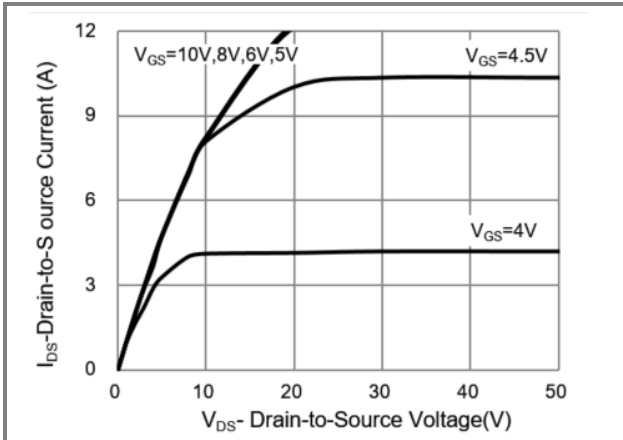


Fig.1 Output Characteristics

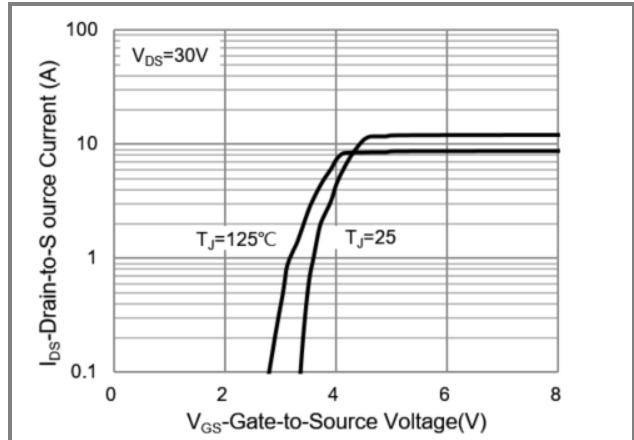


Fig.2 Transfer Characteristics

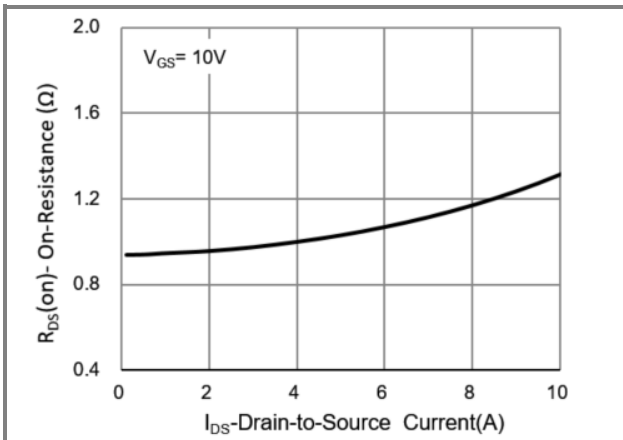


Fig.3 On-Resistance vs. Drain Current

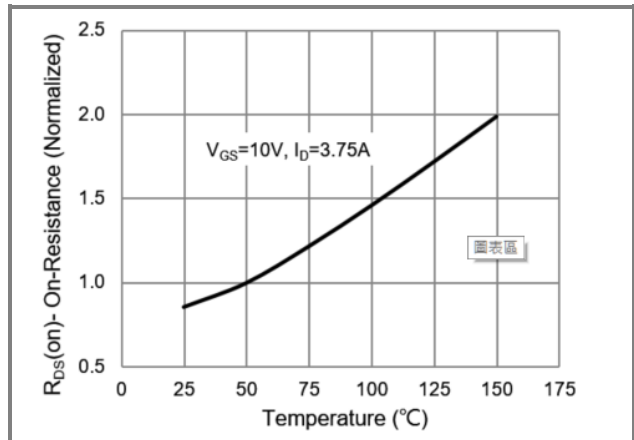


Fig.4 Resistance vs. Junction Temperature

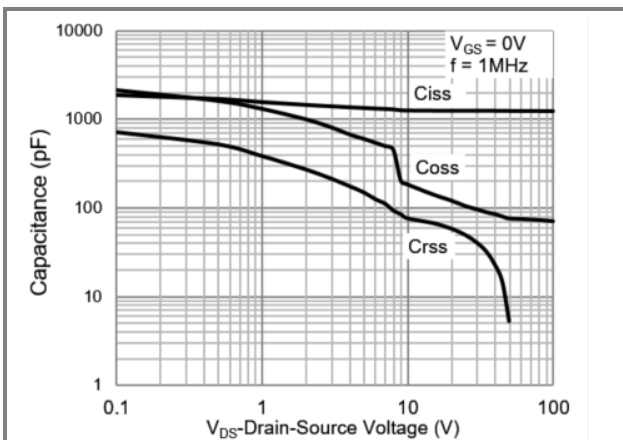


Fig.5 Capacitance vs. Drain-Source Voltage

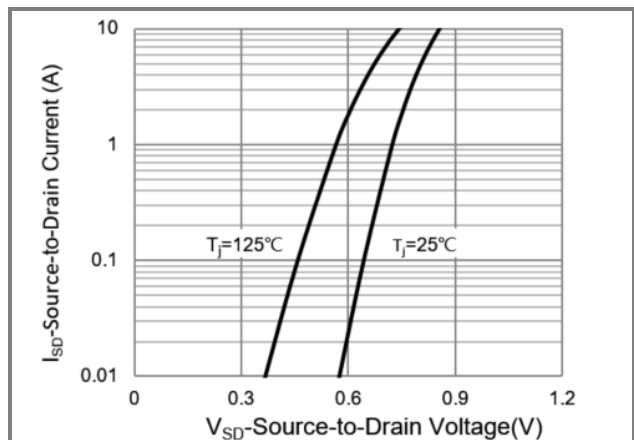


Fig.6 Source-Drain Diode Forward Voltage



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TYPICAL CHARACTERISTIC CURVES

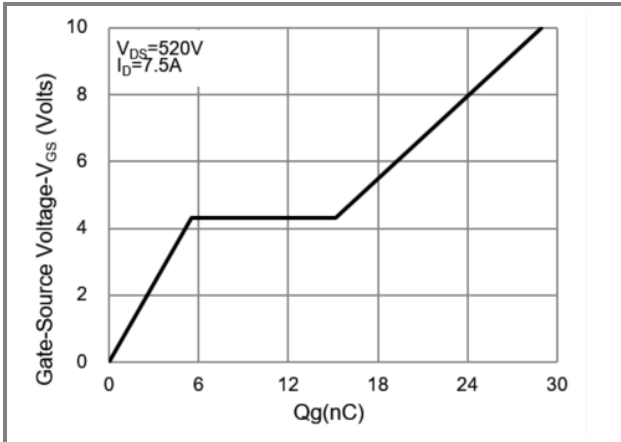


Fig.7 Gate Charge

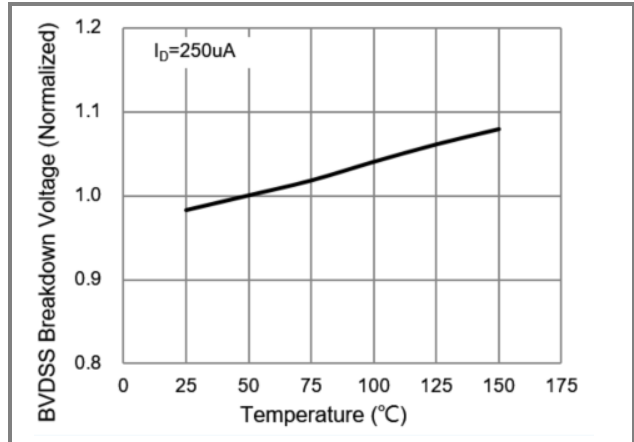


Fig.8 BV_{DSS} vs. Junction Temperature On-

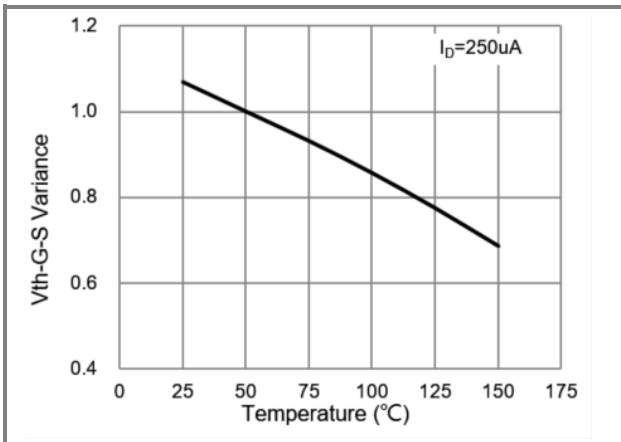


Fig.9 Threshold Voltage Variation with Temperature

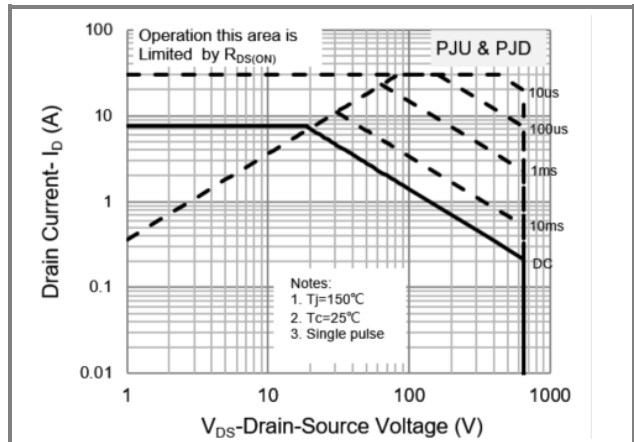


Fig.10 Maximum Safe Operating Area

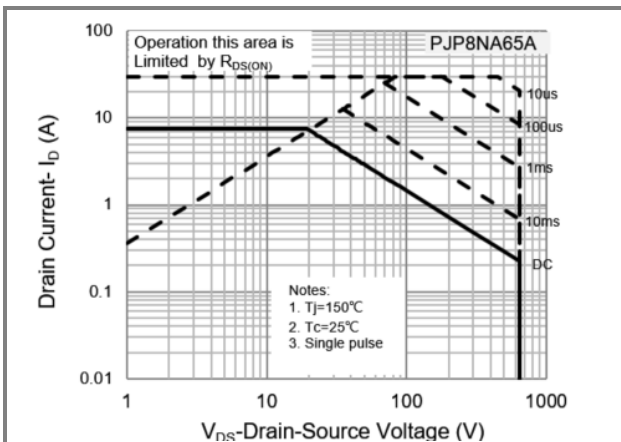


Fig.11 Maximum Safe Operating Area

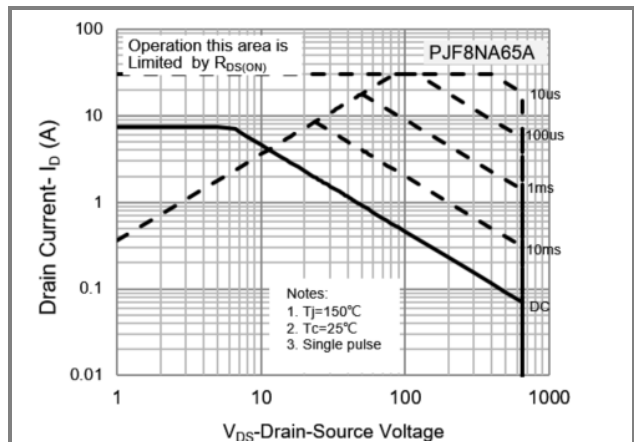


Fig.12 Maximum Safe Operating Area



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TYPICAL CHARACTERISTIC CURVES

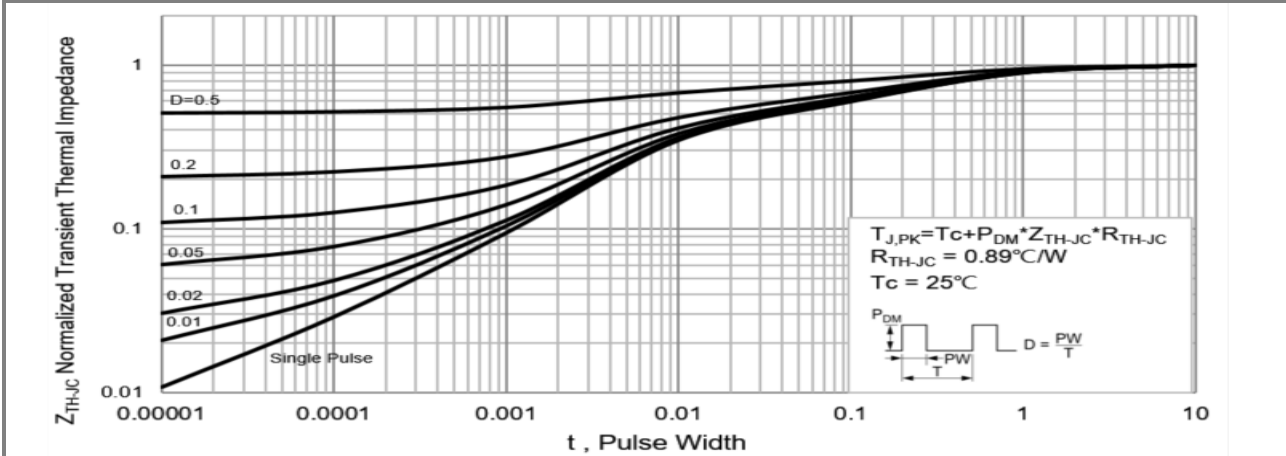


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

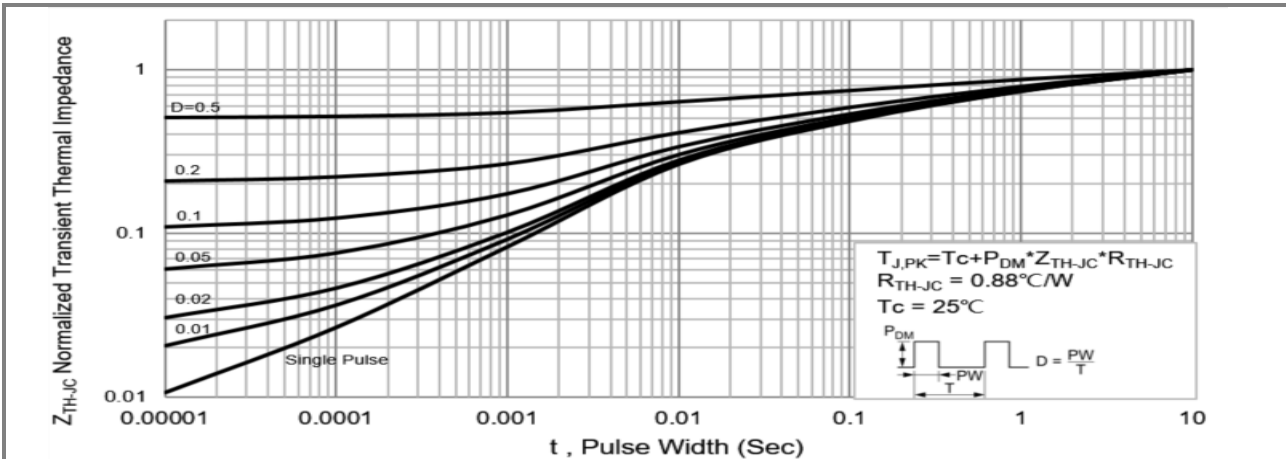


Fig.14 PJP8NA65A Normalized Transient Thermal Impedance vs. Pulse Width

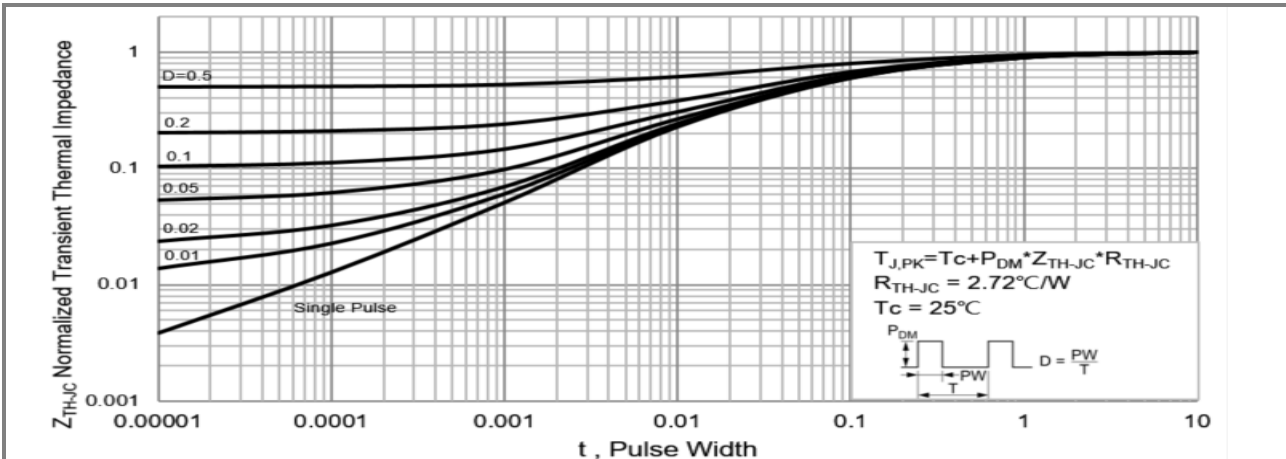
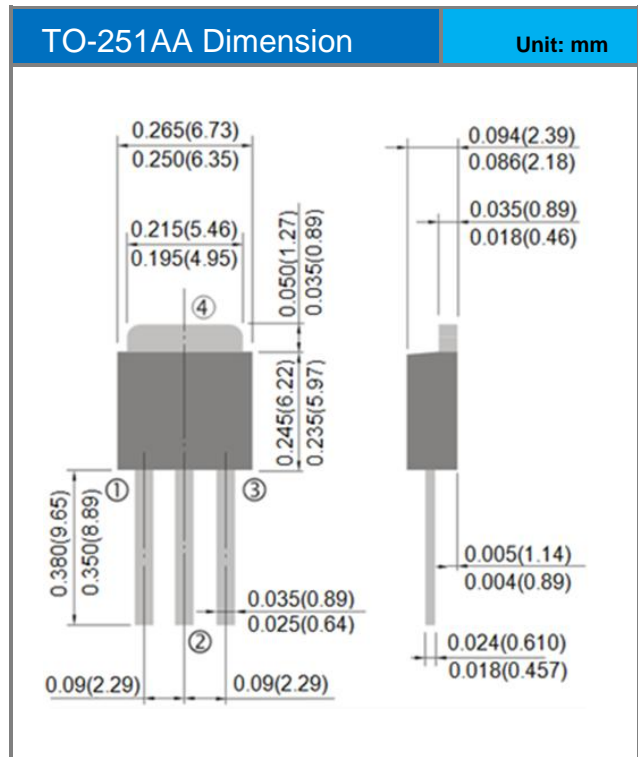
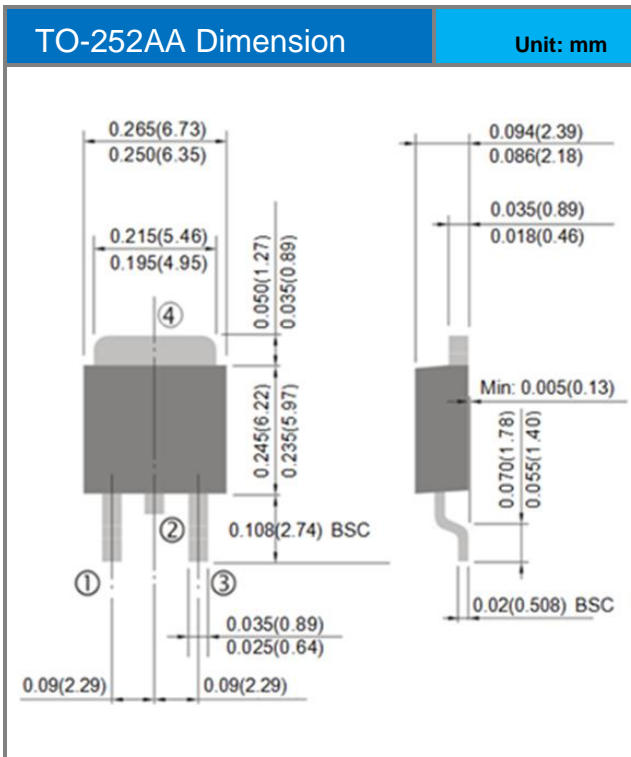
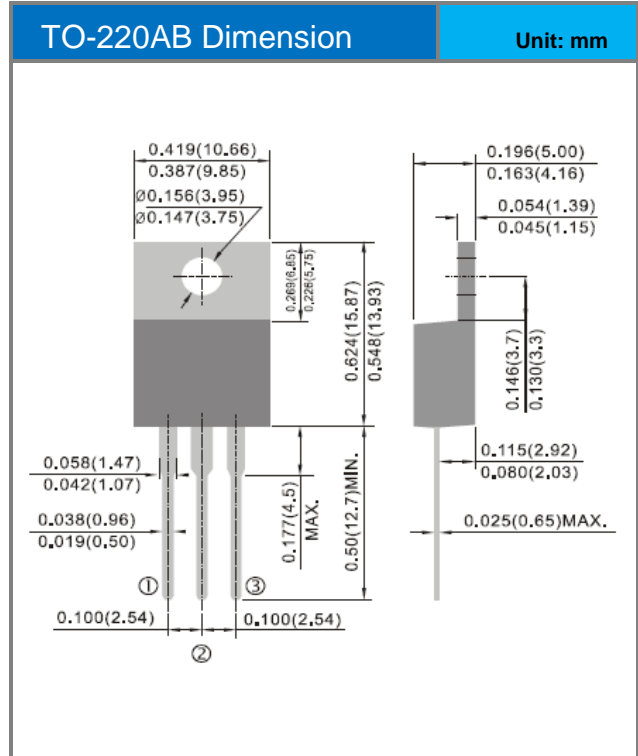
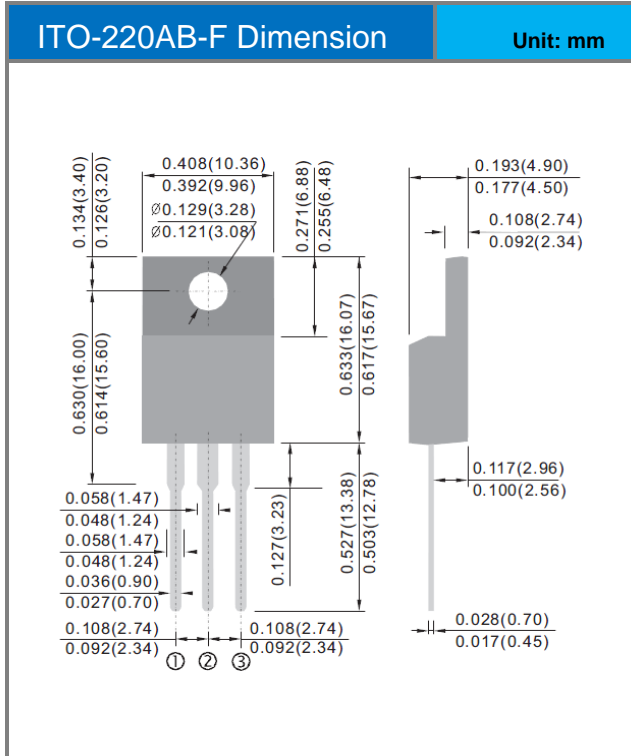


Fig.15 PJF8NA65A Normalized Transient Thermal Impedance vs. Pulse Width



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Packaging Information





PJU8NA65A / PJD8NA65A / PJP8NA65A / PJF8NA65A

PART NO PACKING CODE VERSION

| Part No Packing Code | Package Type | Packing Type | Marking | Version |
|----------------------|--------------|---------------------|---------|--------------|
| PJU8NA65A_T0_00001 | TO-251AA | 80pcs / Tube | U8NA65A | Halogen free |
| PJD8NA65A_L2_00001 | TO-252AA | 3,000pcs / 13" reel | D8NA65A | Halogen free |
| PJP8NA65A_T0_00001 | TO-220AB | 50pcs / Tube | P8NA65A | Halogen free |
| PJF8NA65A_T0_00001 | ITO-220AB-F | 50pcs / Tube | F8NA65A | Halogen free |



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