

PJQ4427DP

20V P-Channel Enhancement Mode MOSFET

Voltage

-20 V

Current

-53 A

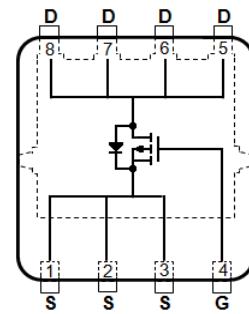
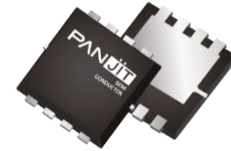
Features

- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-8A < 7m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-2.5V$, $I_D@-5A < 10m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-1.8V$, $I_D@-3A < 15m\Omega$
- LOW $R_{DS(ON)}$
- High current rating
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Mechanical Data

- Case : DFN3333-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.03 grams

DFN3333-8L



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

| PARAMETER | | SYMBOL | LIMIT | UNITS |
|---|---------------------|-----------------|----------|--------------|
| Drain-Source Voltage | | V_{DS} | -20 | V |
| Gate-Source Voltage | | V_{GS} | ± 10 | |
| Continuous Drain Current ^(Note 4) | $T_A=25^\circ C$ | I_D | -16 | A |
| | $T_A=70^\circ C$ | | -13 | |
| Pulsed Drain Current ^(Note 1) | $T_A=25^\circ C$ | I_{DM} | -120 | |
| Power Dissipation | $T_A=25^\circ C$ | P_D | 2.8 | W |
| | $T_A=70^\circ C$ | | 1.8 | |
| Continuous Drain Current ^(Note 4) | $T_C=25^\circ C$ | I_D | -53 | A |
| | $T_C=100^\circ C$ | | -33 | |
| Power Dissipation | $T_C=25^\circ C$ | P_D | 30 | W |
| | $T_C=100^\circ C$ | | 12 | |
| Single Pulse Avalanche Energy ^(Note 6) | | E_{AS} | 56 | mJ |
| Operating Junction and Storage Temperature Range | | T_J, T_{STG} | -55~150 | $^\circ C$ |
| Typical Thermal Resistance ^(Note 5) | Junction to Case | $R_{\theta JC}$ | 4.2 | $^\circ C/W$ |
| | Junction to Ambient | $R_{\theta JA}$ | 45 | |

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Electrical Characteristics (T_A=25°C unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|----------------------------------|---------------------|--|------|-------|------|-------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =-250uA | -20 | - | - | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250uA | -0.5 | -0.68 | -1.1 | |
| Drain-Source On-State Resistance | R _{DS(on)} | V _{GS} =-4.5V, I _D =-8A | - | 5.8 | 7 | mΩ |
| | | V _{GS} =-2.5V, I _D =-5A | - | 7.4 | 10 | |
| | | V _{GS} =-1.8V, I _D =-3A | - | 10.6 | 15 | |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-20V, V _{GS} =0V | - | - | -1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±10V, V _{DS} =0V | - | - | ±100 | nA |
| Dynamic (Note 7) | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =-10V, I _D =-8A, V _{GS} =-4.5V (Note 2,3) | - | 45 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 5 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 11 | - | |
| Input Capacitance | C _{iss} | V _{DS} =-15V, V _{GS} =0V, f=1.0MHZ | - | 4389 | - | pF |
| Output Capacitance | C _{oss} | | - | 360 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 270 | - | |
| Gate resistance | R _g | f=1.0MHZ | - | 5.5 | - | Ω |
| Turn-On Delay Time | td(on) | V _{DD} =-10V, I _D =-8A, V _{GS} =-4.5V, R _G =25Ω (Note 2,3) | - | 38 | - | ns |
| Turn-On Rise Time | tr | | - | 147 | - | |
| Turn-Off Delay Time | td(off) | | - | 382 | - | |
| Turn-Off Fall Time | tf | | - | 224 | - | |
| Drain-Source Diode | | | | | | |
| Diode Forward Current | I _s | --- | - | - | -53 | A |
| Diode Forward Voltage | V _{SD} | I _S =-1A, V _{GS} =0V | - | -0.6 | -1.0 | V |
| Reverse Recovery Time | T _{rr} | V _{GS} =0V, I _S =-8A | - | 17.6 | - | ns |
| Reverse Recovery Charge | Q _{rr} | dI _S /dt=100A/us | - | 4.1 | - | nC |

Notes :

1. Pulse width < 300us, Duty cycle < 2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T_J(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J = 25°C.
4. The maximum current rating is package limited.
5. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch² with 2oz. square pad of copper.
6. The test condition is L=0.1mH, I_{AS}=-33A, V_{DD}=-15V, R_G=25 ohm, Starting T_J=25°C.
7. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

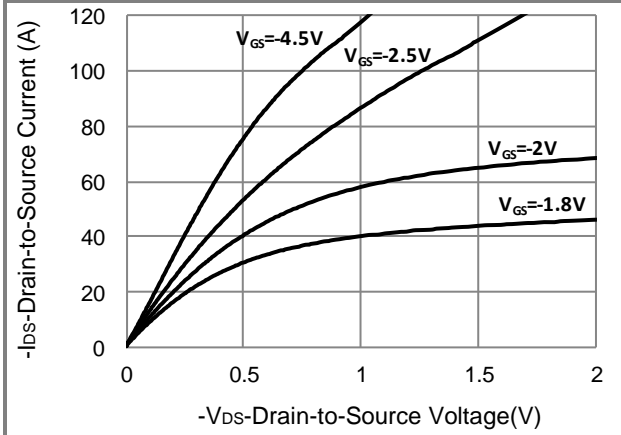


Fig.1 Output Characteristics

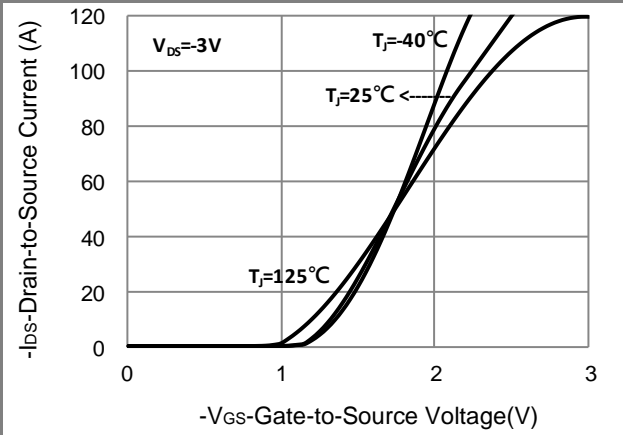


Fig.2 Transfer Characteristics

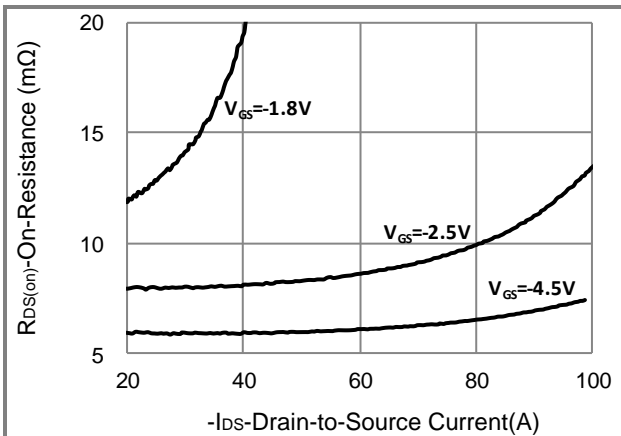


Fig.3 On-Resistance vs. Drain Current

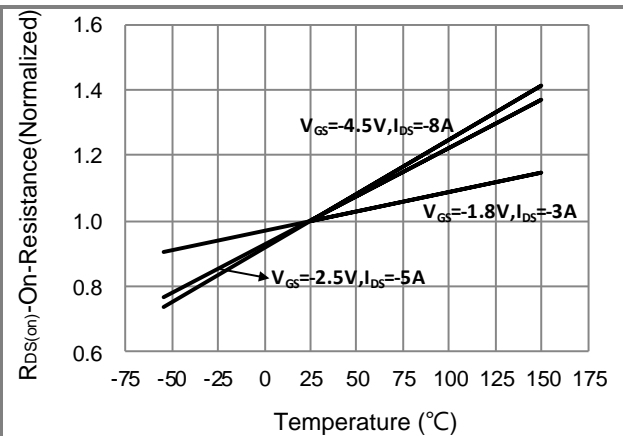


Fig.4 On-Resistance vs. Junction temperature

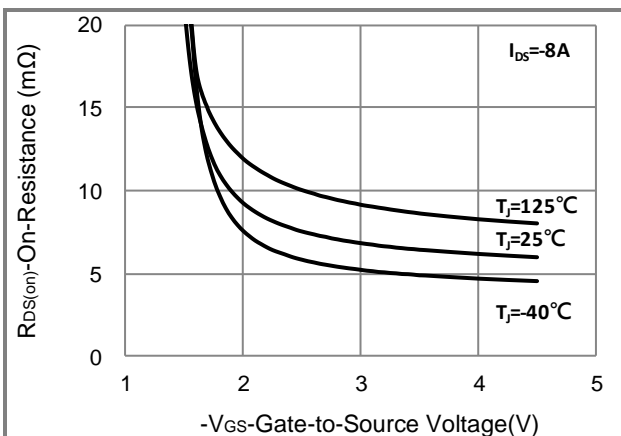


Fig.5 On-Resistance Variation with V_{GS}

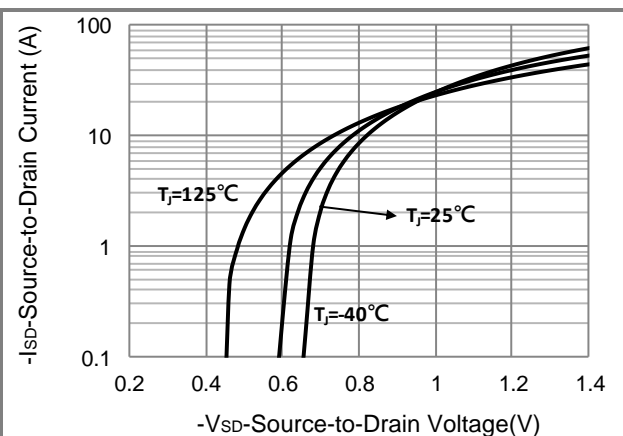


Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES

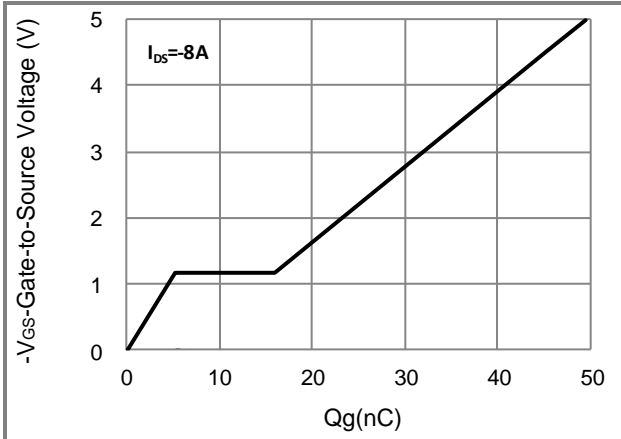


Fig.7 Gate-Charge Characteristics

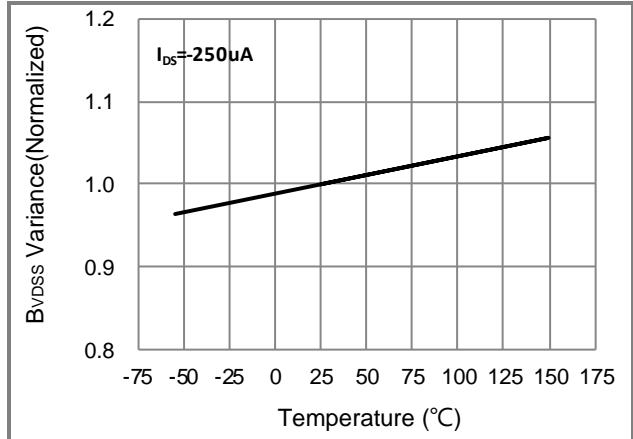


Fig.8 Breakdown Voltage Variation vs. Temperature

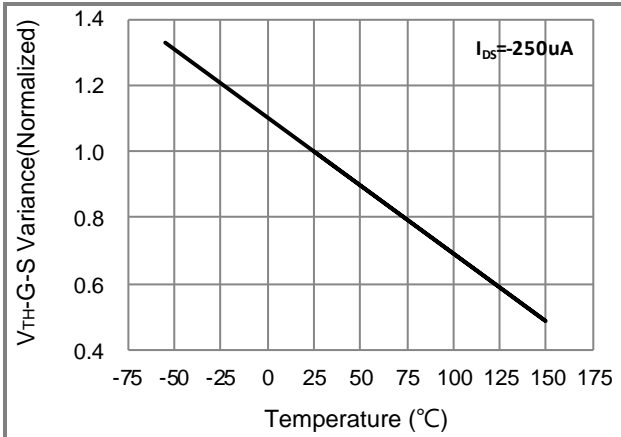


Fig.9 Threshold Voltage Variation with Temperature

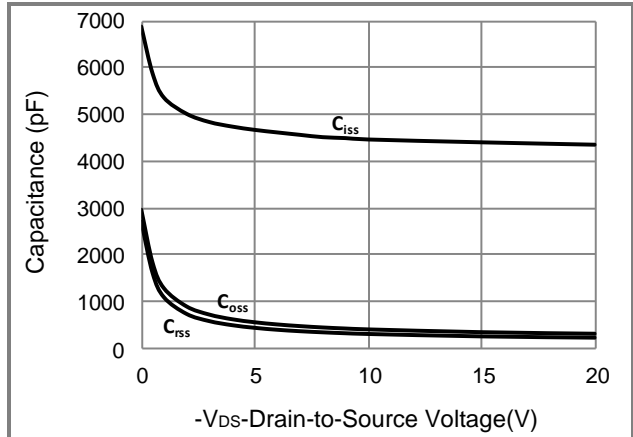


Fig.10 Capacitance vs. Drain-Source Voltage

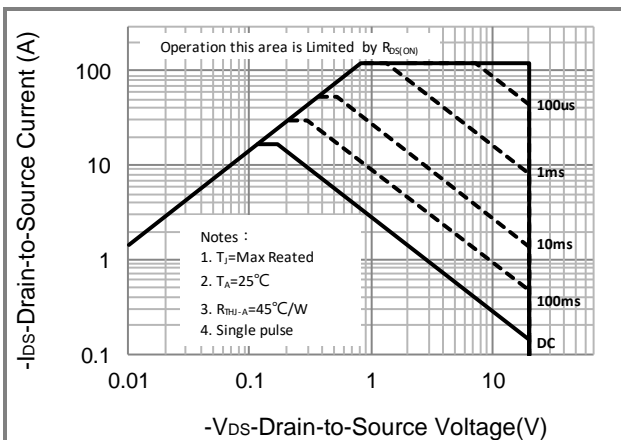


Fig.11 Maximum Safe Operating Area

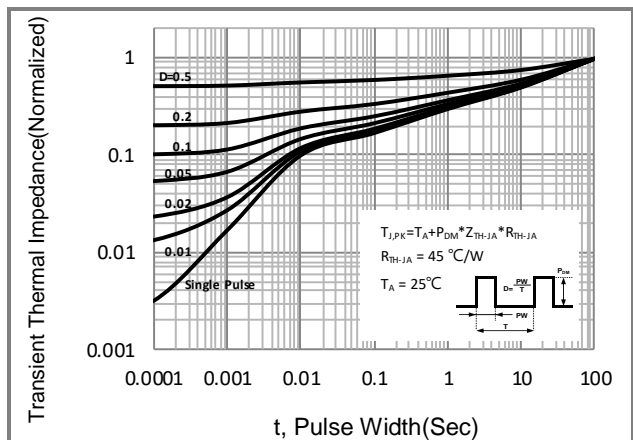


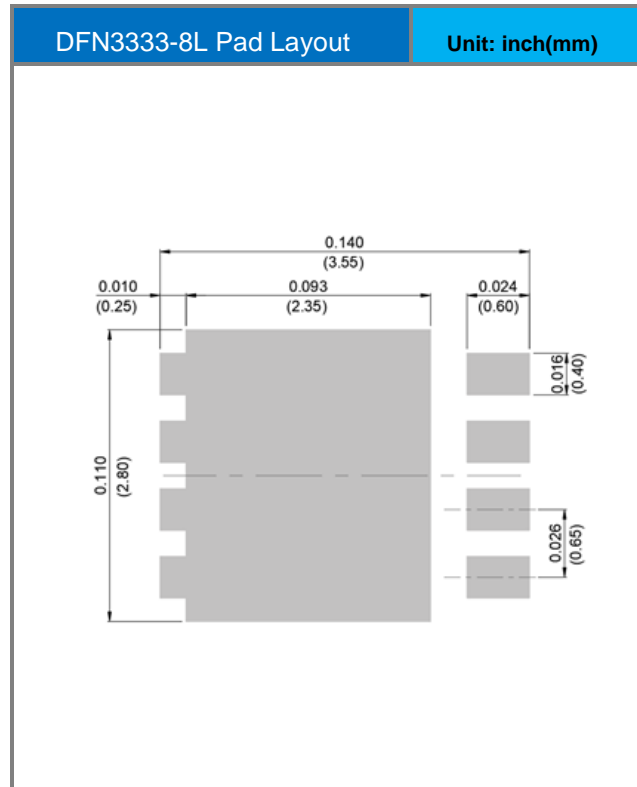
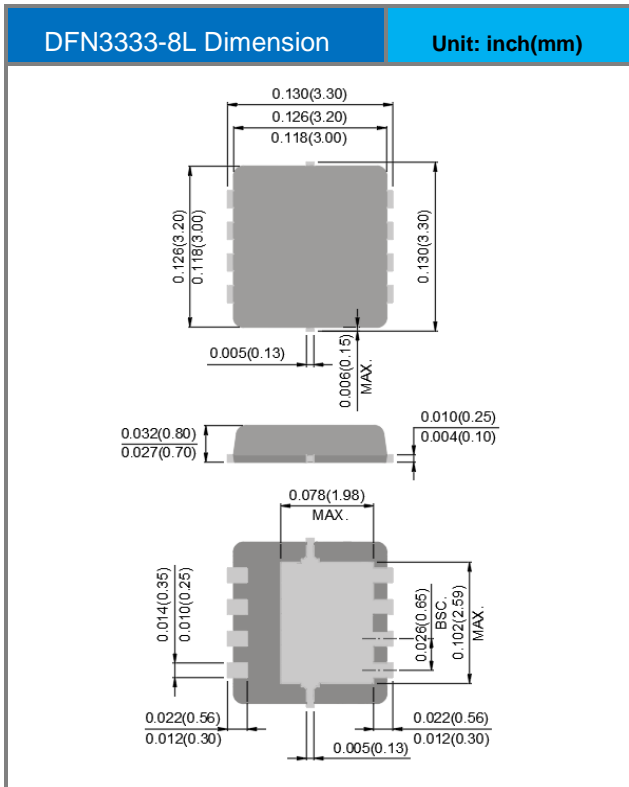
Fig.12 Normalized Transient Thermal Impedance

PJQ4427DP

Product and Packing Information

| Part No. | Package Type | Packing Type | Marking |
|-----------|--------------|-------------------|---------|
| PJQ4427DP | DFN3333-8L | 5K pcs / 13" reel | 4427 |

Packaging Information & Mounting Pad Layout



PJQ4427DP

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