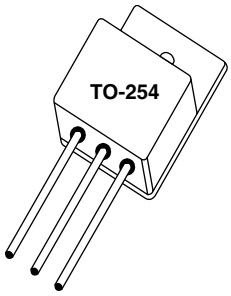
# APT17N80CC3

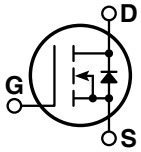
**800V 11.5A 0.320Ω**

## Super Junction MOSFET




COOLMOS™ Power Semiconductors

- **Ultra low $R_{DS(ON)}$**
- **Low Miller Capacitance**
- **Ultra Low Gate Charge, $Q_g$**
- **Avalanche Energy Rated**
- **Hermetic TO-254 Package**




**MAXIMUM RATINGS** All Ratings: $T_C$ = 25°C unless otherwise specified.

| Symbol | Parameter | APT17N80CC3 | UNIT |
|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | 800 | Volts |
| $I_D$ | Continuous Drain Current @ $T_C$ = 25°C | 11.5 | Amps |
| $I_{DM}$ | Pulsed Drain Current ① | 34.5 | |
| $V_{GS}$ | Gate-Source Voltage Continuous | ±20 | Volts |
| $V_{GSM}$ | Gate-Source Voltage Transient | ±30 | |
| $P_D$ | Total Power Dissipation @ $T_C$ = 25°C | 104 | Watts |
| | Linear Derating Factor | 0.83 | W/°C |
| $T_J$,$T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to 150 | °C |
| $T_L$ | Lead Temperature: 0.063" from Case for 10 Sec. | 260 | |
| $dv/dt$ | Drain-Source Voltage slope ($V_{DS}$ = 640V, $I_D$ = 11.5A, $T_J$ = 125°C) | 50 | V/ns |
| $I_{AR}$ | Repetitive Avalanche Current ⑥ | 17 | Amps |
| $E_{AR}$ | Repetitive Avalanche Energy ⑥ | 0.5 | mJ |
| $E_{AS}$ | Single Pulse Avalanche Energy ④ | 670 | |

**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage ($V_{GS}$ = 0V, $I_D$ = 250µA) | 800 | | | Volts |
| $R_{DS(on)}$ | Drain-Source On-State Resistance ② ($V_{GS}$ = 10V, 11A) | | 0.28 | 0.32 | Ohms |
| $I_{DSS}$ | Zero Gate Voltage Drain Current ($V_{DS}$ = 800V, $V_{GS}$ = 0V) | | 0.5 | 25 | µA |
| | Zero Gate Voltage Drain Current ($V_{DS}$ = 800V, $V_{GS}$ = 0V, $T_C$ = 150°C) | | | 250 | |
| $I_{GSS}$ | Gate-Source Leakage Current ($V_{GS}$ = ±20V, $V_{DS}$ = 0V) | | | ±100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage ($V_{DS}$ = $V_{GS}$, $I_D$ = 1mA) | 2.10 | 3 | 3.9 | Volts |

**CAUTION:** These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

*APT Website - http://www.advancedpower.com*

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## DYNAMIC CHARACTERISTICS





| Symbol | Characteristic | Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>f = 1 MHz | | 2255 | | pF |
| $C_{oss}$ | Output Capacitance | | | 1045 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 55 | | |
| $Q_g$ | Total Gate Charge ③ | $V_{GS}$ = 0 to10V<br>$V_{DD}$ = 640V<br>$I_D$ = 17A @ 25°C | | 90 | 177 | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 11 | | |
| $Q_{gd}$ | Gate-Drain ("Miller") Charge | | | 45 | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS}$ = 13V<br>$V_{DD}$ = 400 V<br>$I_D$ = 17A<br>$R_G$ = 4.7Ω, $T_J$ = 125°C | | 25 | | ns |
| $t_r$ | Current Rise Time | | | 15 | | |
| $t_{d(off)}$ | Turn-off Delay Time | | | 70 | 80 | |
| $t_f$ | Current Fall Time | | | 6 | 9 | |

## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | | | 11.5 | Amps |
| $I_{SM}$ | Pulsed Source Current ① (Body Diode) | | | 34.5 | |
| $V_{SD}$ | Diode Forward Voltage ② ($V_{GS}$ = 0V, $I_S$ = -11.5A) | | 1 | 1.2 | Volts |
| $t_{rr}$ | Reverse Recovery Time ($I_S$ = -11.5A, $dI_S/dt$ = 100A/µs) $V_R$ = 350V | | 550 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge ($I_S$ = -11.5A, $dI_S/dt$ = 100A/µs) $V_R$ = 350V | | 15 | | µC |
| $^{dv}/_{dt}$ | Peak Diode Recovery $^{dv}/_{dt}$ ⑤ | | | 6 | V/ns |

## THERMAL CHARACTERISTICS

| Symbol | Characteristic | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Junction to Case | | | 1.20 | °C/W |
| $R_{\theta JA}$ | Junction to Ambient | | | 62 | |

① Repetitive Rating: Pulse width limited by maximum junction temperature

② Pulse Test: Pulse width < 380 µs, Duty Cycle < 2%

③ See MIL-STD-750 Method 3471

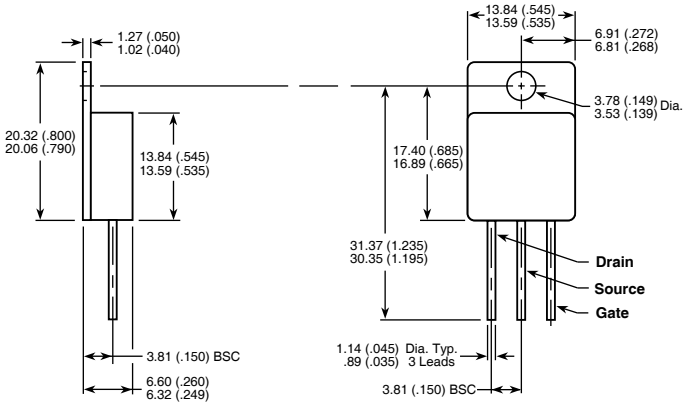
④ Starting $T_j$ = +25°C, L = 115.92mH, $R_G$ = 25Ω, Peak $I_L$ = 3.4A

⑤ $I_S$ = -17A $^{di}/_{dt}$ = 100A/µs $V_R$ = 480V $T_J$ = 125°C

⑥ Repetitve avalanche causes additional power losses that can be calculated as $P_{AV}=E_{AR}*f$

**APT Reserves the right to change, without notice, the specifications and information contained herein.**

### TO-254 Package Outline




Dimensions in Millimeters and (Inches)