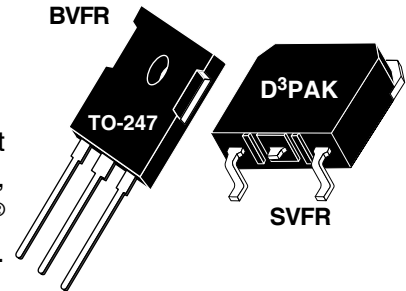
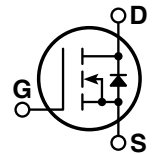


POWER MOS V® FREDFET

Power MOS V® is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimizes the JFET effect, increases packing density and reduces the on-resistance. Power MOS V® also achieves faster switching speeds through optimized gate layout.



- Avalanche Energy Rated
- Lower Leakage
- Faster Switching
- **FAST RECOVERY BODY DIODE**
- TO-247 or Surface Mount D³PAK Package



MAXIMUM RATINGS

 All Ratings: $T_C = 25^\circ\text{C}$ unless otherwise specified.

| Symbol | Parameter | APT1001RBVFR_SVFR | UNIT |
|----------------|--|-------------------|-------|
| V_{DSS} | Drain-Source Voltage | 1000 | Volts |
| I_D | Continuous Drain Current @ $T_C = 25^\circ\text{C}$ | 11 | Amps |
| I_{DM} | Pulsed Drain Current ^① | 44 | |
| V_{GS} | Gate-Source Voltage Continuous | ± 30 | Volts |
| V_{GSM} | Gate-Source Voltage Transient | ± 40 | |
| P_D | Total Power Dissipation @ $T_C = 25^\circ\text{C}$ | 278 | Watts |
| | Linear Derating Factor | 2.22 | 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. | 300 | |
| I_{AR} | Avalanche Current ^① (Repetitive and Non-Repetitive) | 11 | Amps |
| E_{AR} | Repetitive Avalanche Energy ^① | 30 | mJ |
| E_{AS} | Single Pulse Avalanche Energy ^④ | 1210 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|--------------|---|------|-----|-----------|---------------|
| BV_{DSS} | Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250\mu\text{A}$) | 1000 | | | Volts |
| $R_{DS(on)}$ | Drain-Source On-State Resistance ^② ($V_{GS} = 10V, I_D = 5.5A$) | | | 1.00 | Ohms |
| I_{DSS} | Zero Gate Voltage Drain Current ($V_{DS} = 1000V, V_{GS} = 0V$) | | | 250 | μA |
| | Zero Gate Voltage Drain Current ($V_{DS} = 800V, V_{GS} = 0V, T_C = 125^\circ\text{C}$) | | | 1000 | |
| I_{GSS} | Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$) | | | ± 100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1\text{mA}$) | 2 | | 4 | Volts |

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

DYNAMIC CHARACTERISTICS

APT1001RBVFR_SVFR

| Symbol | Characteristic | Test Conditions | MIN | TYP | MAX | UNIT |
|--------------|------------------------------|--|-----|------|-----|------|
| C_{iss} | Input Capacitance | $V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$ | | 3050 | | pF |
| C_{oss} | Output Capacitance | | | 280 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 135 | | |
| Q_g | Total Gate Charge ③ | $V_{GS} = 10V$ $V_{DD} = 500V$ $I_D = 11A @ 25^\circ C$ | | 150 | | nC |
| Q_{gs} | Gate-Source Charge | | | 16 | | |
| Q_{gd} | Gate-Drain ("Miller") Charge | | | 70 | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS} = 15V$ $V_{DD} = 500V$ $I_D = 11A @ 25^\circ C$ $R_G = 1.6\Omega$ | | 12 | | ns |
| t_r | Rise Time | | | 11 | | |
| $t_{d(off)}$ | Turn-off Delay Time | | | 55 | | |
| t_f | Fall Time | | | 12 | | |

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|-----------|---|---------------------|-----|-----|---------|
| I_S | Continuous Source Current (Body Diode) | | | 11 | Amps |
| I_{SM} | Pulsed Source Current ① (Body Diode) | | | 44 | Amps |
| V_{SD} | Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -11A$) | | | 1.3 | Volts |
| dv/dt | Peak Diode Recovery dv/dt ⑤ | | | 18 | V/ns |
| t_{rr} | Reverse Recovery Time ($I_S = -11A, di/dt = 100A/\mu s$) | $T_j = 25^\circ C$ | | 200 | ns |
| | | $T_j = 125^\circ C$ | | 350 | |
| Q_{rr} | Reverse Recovery Charge ($I_S = -11A, di/dt = 100A/\mu s$) | $T_j = 25^\circ C$ | | 0.7 | μC |
| | | $T_j = 125^\circ C$ | | 1.5 | |
| I_{RRM} | Peak Recovery Current ($I_S = -11A, di/dt = 100A/\mu s$) | $T_j = 25^\circ C$ | | 11 | Amps |
| | | $T_j = 125^\circ C$ | | 16 | |

THERMAL CHARACTERISTICS

| Symbol | Characteristic | MIN | TYP | MAX | UNIT |
|-----------------|---------------------|-----|-----|------|--------------|
| $R_{\theta JC}$ | Junction to Case | | | 0.45 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction to Ambient | | | 40 | |

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 $T_j = +25^\circ C, L = 20.0mH, R_G = 25\Omega, \text{Peak } I_L = 11A$

⑤ dv/dt numbers reflect the limitations of the test circuit rather than the device itself. $I_S \leq -I_D 11A, di/dt \leq 700A/\mu s, v_R \leq 1000V, T_j \leq 150^\circ C$

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

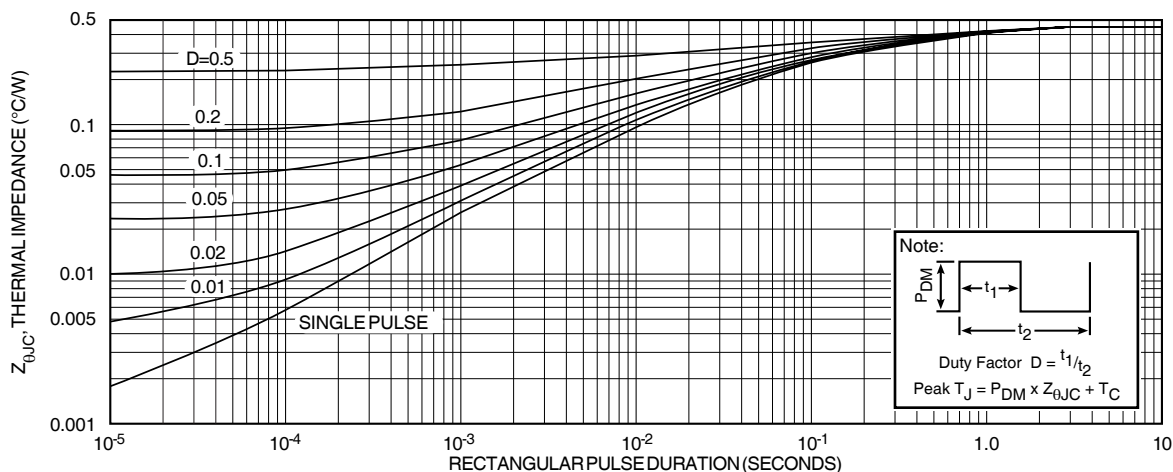


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

Typical Performance Curves

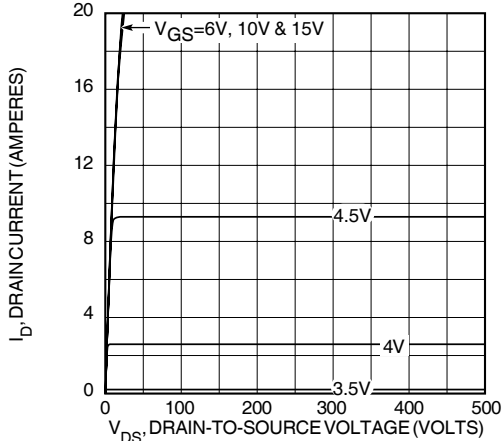


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

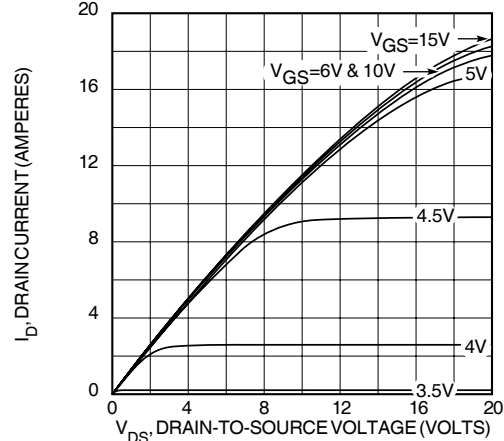


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

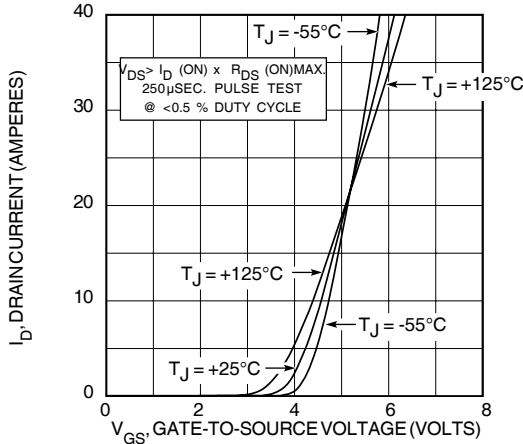


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

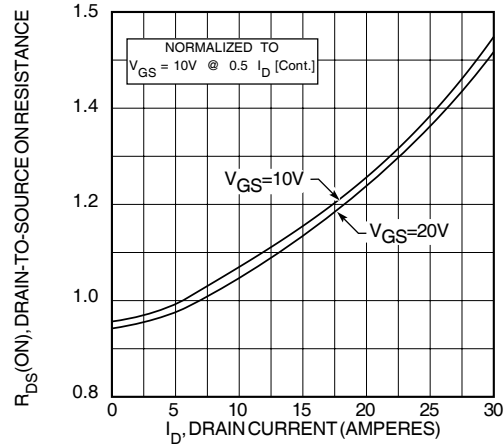


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

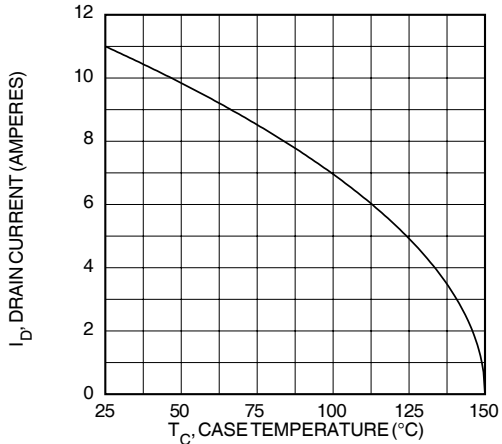


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

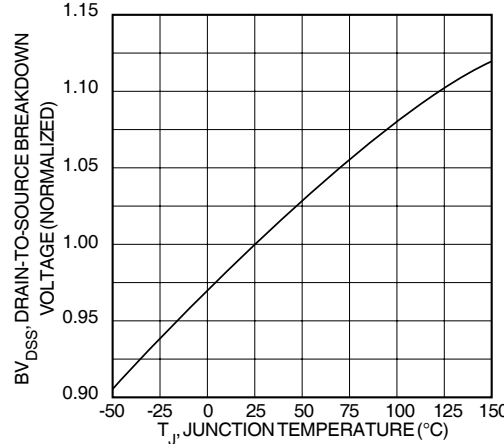


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

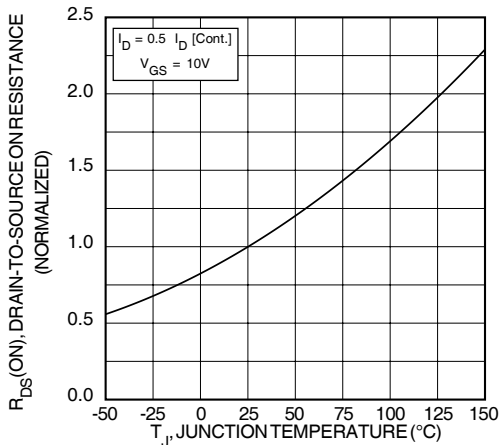


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

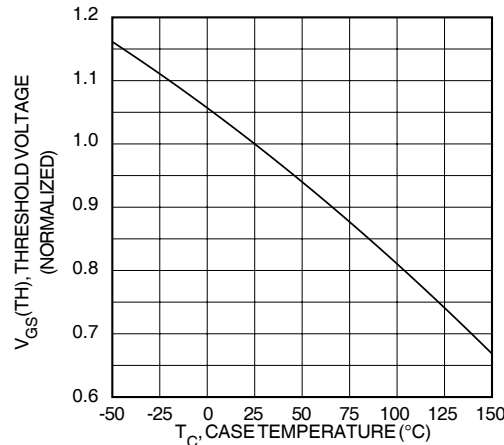


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

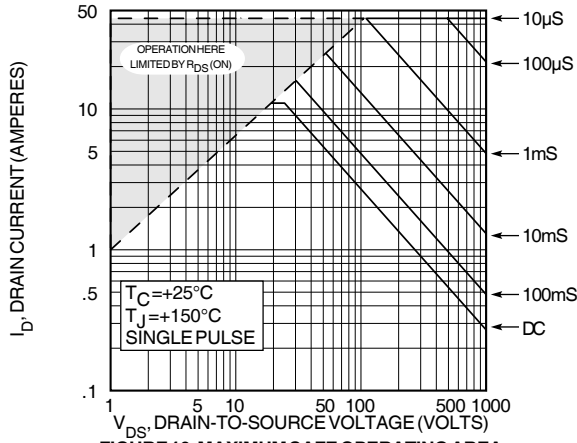


FIGURE 10, MAXIMUM SAFE OPERATING AREA

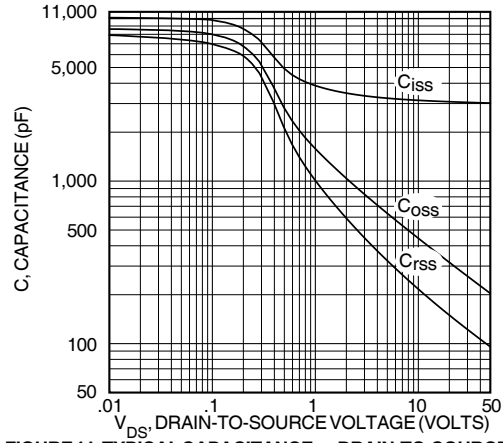


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

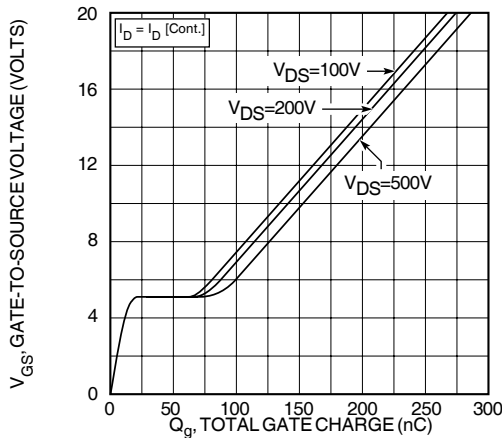


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

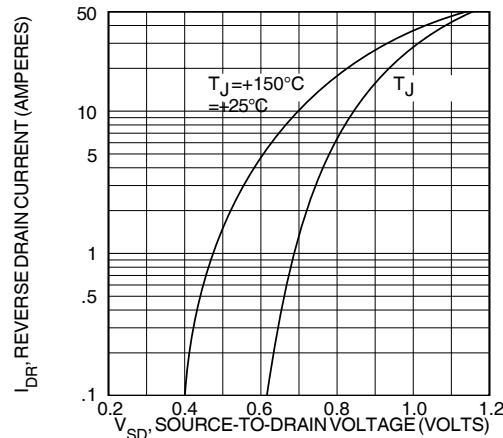
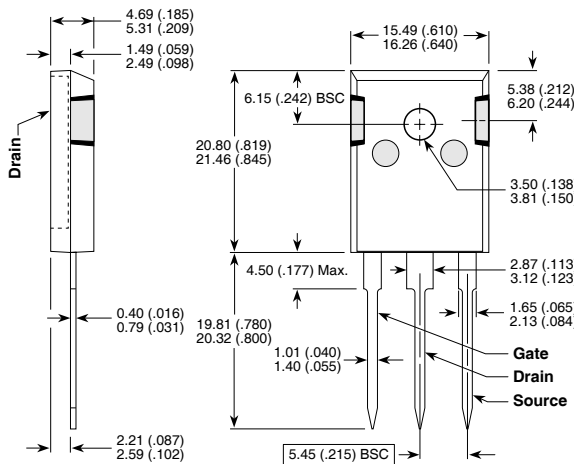


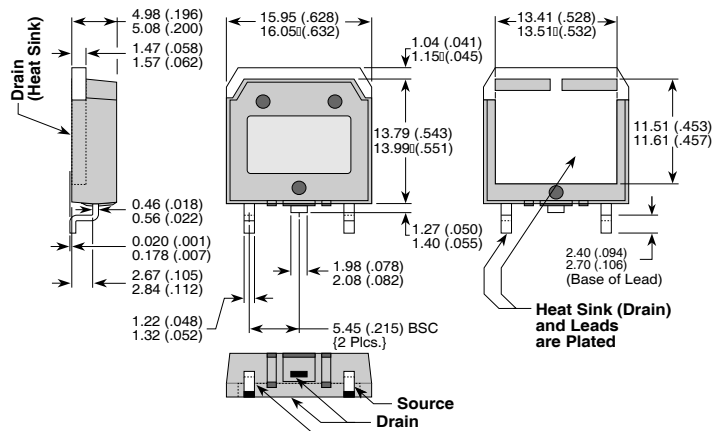
FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-247 Package Outline (BVFR)



Dimensions in Millimeters and (Inches)

D³PAK Package Outline (SVFR)



Dimensions in Millimeters (Inches)



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