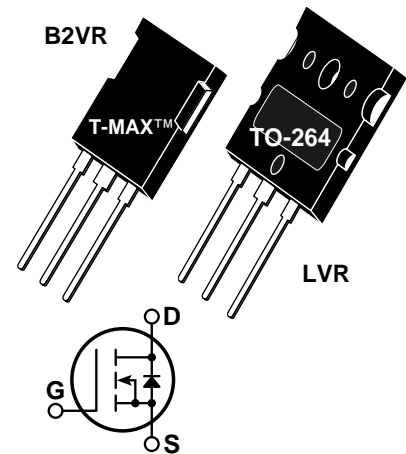


**POWER MOS V®**

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.



- **Identical Specifications: T-MAX™ or TO-264 Package**
- **Faster Switching**                      • **100% Avalanche Tested**
- **Lower Leakage**

**MAXIMUM RATINGS**

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

| Symbol         | Parameter   | APT20M18   | UNIT  |
|----------------|---|------------|-------|
| $V_{DSS}$      | Drain-Source Voltage                                  | 200        | Volts |
| $I_D$          | Continuous Drain Current @ $T_C = 25^\circ\text{C}$ ⑤ | 100        | Amps  |
| $I_{DM}$       | Pulsed Drain Current ① ⑤                              | 400        |       |
| $V_{GS}$       | Gate-Source Voltage Continuous                        | $\pm 30$   | Volts |
| $V_{GSM}$      | Gate-Source Voltage Transient                         | $\pm 40$   |       |
| $P_D$          | Total Power Dissipation @ $T_C = 25^\circ\text{C}$    | 625        | Watts |
|                | Linear Derating Factor                                | 5.0        | 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 ⑤ (Repetitive and Non-Repetitive) | 100        | Amps  |
| $E_{AR}$       | Repetitive Avalanche Energy ①                         | 50         | mJ    |
| $E_{AS}$       | Single Pulse Avalanche Energy ④                       | 3000       |       |

**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol       | Characteristic / Test Conditions   | MIN | TYP | MAX       | UNIT          |
|--------------|--|-----|-----|-----------|---------------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage ( $V_{GS} = 0V, I_D = 250\mu\text{A}$ )                           | 200 |     |           | Volts         |
| $I_{D(on)}$  | On State Drain Current ② ⑤ ( $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$ )        | 100 |     |           | Amps          |
| $R_{DS(on)}$ | Drain-Source On-State Resistance ② ( $V_{GS} = 10V, 0.5 I_{D[Cont.]}$ )                          |     |     | 0.018     | Ohms          |
| $I_{DSS}$    | Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}, V_{GS} = 0V$ )                              |     |     | 25        | $\mu\text{A}$ |
|              | Zero Gate Voltage Drain Current ( $V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$ ) |     |     | 250       |               |
| $I_{GSS}$    | Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )                                  |     |     | $\pm 100$ | nA            |
| $V_{GS(th)}$ | Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 2.5\text{mA}$ )                                 | 2   |     | 4         | Volts         |

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

APT Website - <http://www.advancedpower.com>

|               |                          |                           |                           |                         |
|---------------|--------------------------|---------------------------|---------------------------|-------------------------|
| <b>USA</b>    | 405 S.W. Columbia Street | Bend, Oregon 97702-1035   | Phone: (541) 382-8028     | FAX: (541) 388-0364     |
| <b>EUROPE</b> | Chemin de Magret         | F-33700 Merignac - France | Phone: (33) 5 57 92 15 15 | FAX: (33) 5 56 47 97 61 |

**DYNAMIC CHARACTERISTICS**

**APT20M18 B2VR - LVR**

| Symbol       | Characteristic                 | Test Conditions  | MIN | TYP  | MAX | UNIT |
|--------------|--------------------------------|--|-----|------|-----|------|
| $C_{iss}$    | Input Capacitance              | $V_{GS} = 0V$<br>$V_{DS} = 25V$<br>$f = 1\text{ MHz}$  |     | 9910 |     | pF   |
| $C_{oss}$    | Output Capacitance             |  |     | 2270 |     |      |
| $C_{rss}$    | Reverse Transfer Capacitance   |  |     | 650  |     |      |
| $Q_g$        | Total Gate Charge <sup>③</sup> | $V_{GS} = 10V$<br>$V_{DD} = 0.5 V_{DSS}$<br>$I_D = 0.5 I_{D[Cont.]} @ 25^\circ C$                  |     | 330  |     | nC   |
| $Q_{gs}$     | Gate-Source Charge             |  |     | 75   |     |      |
| $Q_{gd}$     | Gate-Drain ("Miller") Charge   |  |     | 143  |     |      |
| $t_{d(on)}$  | Turn-on Delay Time             | $V_{GS} = 15V$<br>$V_{DD} = 0.5 V_{DSS}$<br>$I_D = I_{D[Cont.]} @ 25^\circ C$<br>$R_G = 0.6\Omega$ |     | 18   |     | ns   |
| $t_r$        | Rise Time                      |  |     | 27   |     |      |
| $t_{d(off)}$ | Turn-off Delay Time            |  |     | 54   |     |      |
| $t_f$        | Fall Time                      |  |     | 6    |     |      |

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

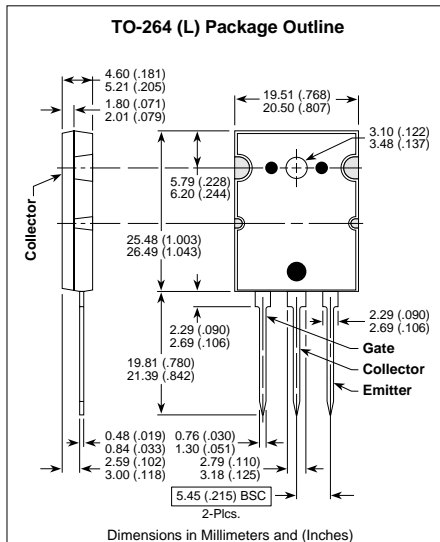
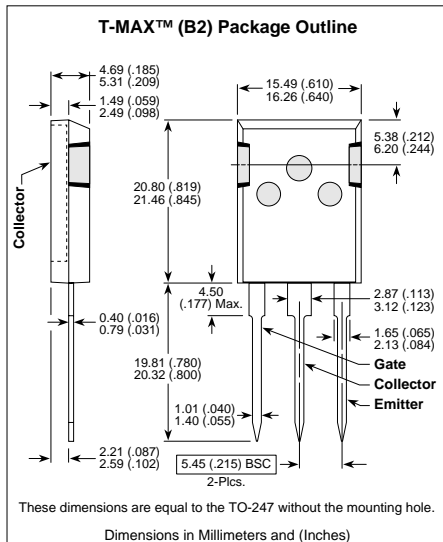
| Symbol   | Characteristic / Test Conditions  | MIN | TYP | MAX | UNIT    |
|----------|---|-----|-----|-----|---------|
| $I_S$    | Continuous Source Current <sup>⑤</sup> (Body Diode)                       |     |     | 100 | Amps    |
| $I_{SM}$ | Pulsed Source Current <sup>① ⑤</sup> (Body Diode)                         |     |     | 400 |         |
| $V_{SD}$ | Diode Forward Voltage <sup>②</sup> ( $V_{GS} = 0V, I_S = -I_{D[Cont.]}$ ) |     |     | 1.3 | Volts   |
| $t_{rr}$ | Reverse Recovery Time ( $I_S = -I_{D[Cont.]}, di_S/dt = 100A/\mu s$ )     |     | 360 |     | ns      |
| $Q_{rr}$ | Reverse Recovery Charge ( $I_S = -I_{D[Cont.]}, di_S/dt = 100A/\mu s$ )   |     | 6.7 |     | $\mu C$ |

**THERMAL CHARACTERISTICS**

| Symbol          | Characteristic      | MIN | TYP | MAX  | UNIT         |
|-----------------|---------------------|-----|-----|------|--------------|
| $R_{\theta JC}$ | Junction to Case    |     |     | 0.20 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction to Ambient |     |     | 40   |              |

- ① Repetitive Rating: Pulse width limited by maximum  $T_j$
- ② Pulse Test: Pulse width < 380  $\mu s$ , Duty Cycle < 2%
- ③ See MIL-STD-750 Method 3471
- ④ Starting  $T_j = +25^\circ C$ ,  $L = 600\mu H$ ,  $R_G = 25\Omega$ , Peak  $I_L = 100A$
- ⑤ The maximum current is limited by lead temperature.

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





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