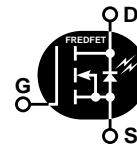
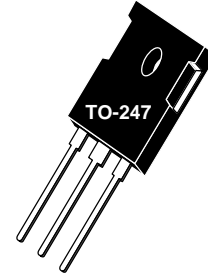


### POWER MOS V

**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.



- Fast Recovery Body Diode
- Lower Leakage
- Faster Switching
- 100% Avalanche Tested
- Popular TO-247 Package

#### MAXIMUM RATINGS

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

Symbol	Parameter	APT1001RBVFR	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 <sup>①</sup>	44	
$V_{GS}$	Gate-Source Voltage Continuous	$\pm 30$	Volts
$V_{GSM}$	Gate-Source Voltage Transient	$\pm 40$	
$P_D$	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	280	Watts
	Linear Derating Factor	2.24	W/ $^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$T_L$	Lead Temperature: 0.063" from Case for 10 Sec.	300	
$I_{AR}$	Avalanche Current <sup>①</sup> (Repetitive and Non-Repetitive)	11	Amps
$E_{AR}$	Repetitive Avalanche Energy <sup>①</sup>	30	mJ
$E_{AS}$	Single Pulse Avalanche Energy <sup>④</sup>	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
$I_{D(on)}$	On State Drain Current <sup>②</sup> ( $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$ )	11			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>②</sup> ( $V_{GS} = 10V, 0.5 I_{D(Cont.)}$ )			1.00	Ohms
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}, V_{GS} = 0V$ )			250	$\mu\text{A}$
	Zero Gate Voltage Drain Current ( $V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$ )			1000	
$I_{GSS}$	Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1.0\text{mA}$ )	2		4	Volts


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

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## DYNAMIC CHARACTERISTICS

APT1001RBVFR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$		3050		pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25V$		270		
$C_{rss}$	Reverse Transfer Capacitance	$f = 1 \text{ MHz}$		125		
$Q_g$	Total Gate Charge <sup>③</sup>	$V_{GS} = 10V$		150		nC
$Q_{gs}$	Gate-Source Charge	$V_{DD} = 0.5 V_{DSS}$		16		
$Q_{gd}$	Gate-Drain ("Miller") Charge	$I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$		78		
$t_d(\text{on})$	Turn-on Delay Time	$V_{GS} = 15V$		12		ns
$t_r$	Rise Time	$V_{DD} = 0.5 V_{DSS}$		11		
$t_d(\text{off})$	Turn-off Delay Time	$I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$		60		
$t_f$	Fall Time	$R_G = 1.6\Omega$		15		

## 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 <sup>①</sup> (Body Diode)			44	
$V_{SD}$	Diode Forward Voltage <sup>②</sup> ( $V_{GS} = 0V, I_S = -I_D [\text{Cont.}]$ )			1.3	Volts
$dv/dt$	Peak Diode Recovery $dv/dt$ <sup>⑤</sup>			5	V/ns
$t_{rr}$	Reverse Recovery Time ( $I_S = -I_D [\text{Cont.}], di/dt = 100A/\mu s$ )	$T_j = 25^\circ\text{C}$		200	ns
		$T_j = 125^\circ\text{C}$		350	
$Q_{rr}$	Reverse Recovery Charge ( $I_S = -I_D [\text{Cont.}], di/dt = 100A/\mu s$ )	$T_j = 25^\circ\text{C}$	0.7		$\mu\text{C}$
		$T_j = 125^\circ\text{C}$	1.5		
$I_{RRM}$	Peak Recovery Current ( $I_S = -I_D [\text{Cont.}], di/dt = 100A/\mu s$ )	$T_j = 25^\circ\text{C}$	11		Amps
		$T_j = 125^\circ\text{C}$	16		

## THERMAL CHARACTERISTICS

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

① Repetitive Rating: Pulse width limited by maximum junction temperature.

② Pulse Test: Pulse width < 380  $\mu\text{s}$ , Duty Cycle < 2%

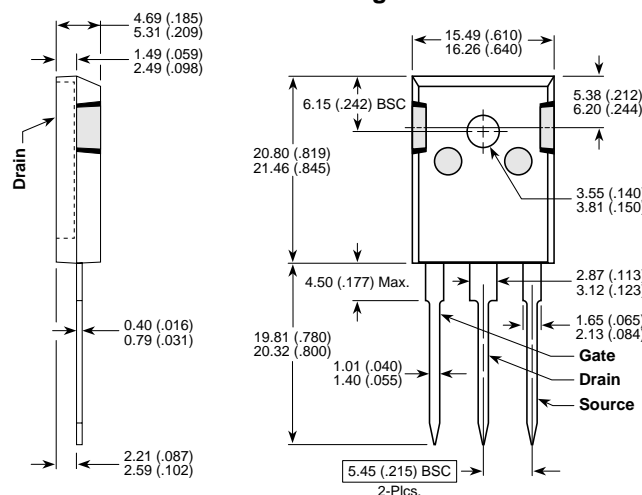
③ See MIL-STD-750 Method 3471

④ Starting  $T_j = +25^\circ\text{C}$ ,  $L = 20\text{mH}$ ,  $R_G = 25\Omega$ , Peak  $I_L = 11\text{A}$

⑤  $I_S \leq -I_D [\text{Cont.}], di/dt = 100A/\mu s, V_{DD} \leq V_{DSS}, T_j \leq 150^\circ\text{C}, R_G = 2.0\Omega, V_R = 200V$ .

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

### TO-247AD Package Outline



Dimensions in Millimeters and (Inches)