



**APT50M85B2VR  
APT50M85LVR  
500V 56A 0.085Ω**

## POWER MOS V®

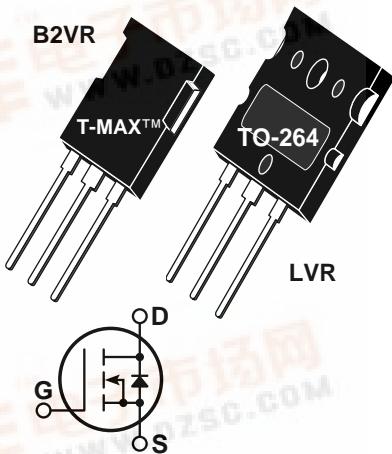
Power MOS V® is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimizes the JFET effect, increases packing density and reduces the on-resistance. Power MOS V® also achieves faster switching speeds through optimized gate layout.

- 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	APT50M85	UNIT
$V_{DSS}$	Drain-Source Voltage	500	Volts
$I_D$	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	56	Amps
$I_{DM}$	Pulsed Drain Current <sup>①</sup>	224	
$V_{GS}$	Gate-Source Voltage Continuous	$\pm 30$	
$V_{GSM}$	Gate-Source Voltage Transient	$\pm 40$	Volts
$P_D$	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	625	Watts
	Linear Derating Factor	5.0	$\text{W}/^\circ\text{C}$
$T_J, T_{STG}$	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)	56	Amps
$E_{AR}$	Repetitive Avalanche Energy <sup>①</sup>	50	mJ
$E_{AS}$	Single Pulse Avalanche Energy <sup>④</sup>	3000	



### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$BV_{DSS}$	Drain-Source Breakdown Voltage ( $V_{GS} = 0\text{V}$ , $I_D = 250\mu\text{A}$ )	500			Volts
$I_{D(on)}$	On State Drain Current <sup>②</sup> ( $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10\text{V}$ )	56			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>②</sup> ( $V_{GS} = 10\text{V}$ , $0.5 I_{D(\text{Cont.})}$ )			0.085	Ohms
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}$ , $V_{GS} = 0\text{V}$ )		25		$\mu\text{A}$
	Zero Gate Voltage Drain Current ( $V_{DS} = 0.8 V_{DSS}$ , $V_{GS} = 0\text{V}$ , $T_C = 125^\circ\text{C}$ )		250		
$I_{GSS}$	Gate-Source Leakage Current ( $V_{GS} = \pm 30\text{V}$ , $V_{DS} = 0\text{V}$ )			$\pm 100$	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>



## DYNAMIC CHARACTERISTICS

APT50M85 B2VR - LVR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		8630		pF
$C_{oss}$	Output Capacitance			1160		
$C_{rss}$	Reverse Transfer Capacitance			440		
$Q_g$	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = 0.5 I_{D[\text{Cont.}]} @ 25^\circ\text{C}$		360		nC
$Q_{gs}$	Gate-Source Charge			57		
$Q_{gd}$	Gate-Drain ("Miller") Charge			151		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_{D[\text{Cont.}]} @ 25^\circ\text{C}$ $R_G = 0.6\Omega$		16		ns
$t_r$	Rise Time			18		
$t_{d(off)}$	Turn-off Delay Time			60		
$t_f$	Fall Time			6		

## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$I_S$	Continuous Source Current (Body Diode)			56	Amps
$I_{SM}$	Pulsed Source Current ① (Body Diode)			24	
$V_{SD}$	Diode Forward Voltage ② ( $V_{GS} = 0V, I_S = -I_{D[\text{Cont.}]} @ 25^\circ\text{C}$ )			1.3	Volts
$t_{rr}$	Reverse Recovery Time ( $I_S = -I_{D[\text{Cont.}]} @ 25^\circ\text{C}, dI_S/dt = 100A/\mu\text{s}$ )		680		ns
$Q_{rr}$	Reverse Recovery Charge ( $I_S = -I_{D[\text{Cont.}]} @ 25^\circ\text{C}, dI_S/dt = 100A/\mu\text{s}$ )		17.0		$\mu\text{C}$

## THERMAL CHARACTERISTICS

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

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

③ See MIL-STD-750 Method 3471

④ Starting  $T_j = +25^\circ\text{C}$ ,  $L = 1.91\text{mH}$ ,  $R_G = 25\Omega$ , Peak  $I_L = 56\text{A}$

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

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

