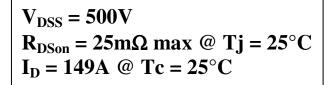
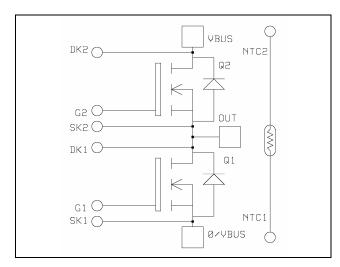


APTM50AM25FT

Phase leg MOSFET Power Module





Application

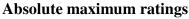
- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Power MOS V[®] FREDFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Fast intrinsic diode
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Kelvin Drain for VDS monitoring
- Very low stray inductance
 - Symmetrical design
 - M5 power connectors
- Internal thermistor for temperature monitoring
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals for signal and M5 for power for easy PCB mounting



0/VBUS

OUT

Absolute maximum ratings							
Symbol	Parameter		Max ratings	Unit			
$V_{ m DSS}$	Drain - Source Breakdown Voltage		500	V			
т	Cartin a David Consult	$T_c = 25^{\circ}C$	149				
1_{D}	I _D Continuous Drain Current		111	Α			
I_{DM}	Pulsed Drain current		450				
V_{GS}	Gate - Source Voltage		±30	V			
R_{DSon}	Drain - Source ON Resistance		25	mΩ			
P_{D}	Maximum Power Dissipation $T_c = 25^{\circ}C$		1250	W			
I_{AR}	Avalanche current (repetitive and non repetitive)		149	A			
E_{AR}	Repetitive Avalanche Energy		30	I			
E_{AS}	Single Pulse Avalanche Energy		1300	mJ			

∽NC ∽NTC1

VBUS

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handing Procedures Should Be Followed.



APTM50AM25FT

Electrical Characteristics All ratings @ $T_j = 25^{\circ}$ C unless otherwise specified

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain - Source Breakdown Voltage	$V_{GS} = 0V$, $I_D = 1mA$	500			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 500V$ $T_j = 25^{\circ}C$			1000	^
	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 400V$ $T_j = 125^{\circ}C$:		2500	μA
R _{DS(on)}	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 74.5A$			25	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 8mA$	2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30 \text{ V}, V_{DS} = 0 \text{ V}$			±250	nA

Dynamic Characteristics

·	Characteristic	Test Conditions	Min	Тур	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		29.6		
C_{oss}	Output Capacitance	$V_{DS} = 25V$		4.1		nF
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		1.6		
Q_{g}	Total gate Charge	$V_{GS} = 10V$		1200		
Q_{gs}	Gate – Source Charge	$V_{\text{Bus}} = 250V$		200		nC
Q_{gd}	Gate – Drain Charge	$I_D = 149A$		560		
$T_{d(on)}$	Turn-on Delay Time	$\label{eq:Resistive Switching} \begin{split} & \textbf{Resistive Switching} \\ & \textbf{V}_{GS} = 15 \textbf{V} \\ & \textbf{V}_{Bus} = 250 \textbf{V} \\ & \textbf{I}_{D} = 149 \textbf{A} \\ & \textbf{R}_{G} = 0.22 \ \Omega \end{split}$		15		
$T_{\rm r}$	Rise Time			20		
$T_{d(off)}$	Turn-off Delay Time			50		ns
T_{f}	Fall Time			10		

Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I_S	Continuous Source current		$Tc = 25^{\circ}C$			149	A
	(Body diode)		$Tc = 80^{\circ}C$			111	Λ
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = -149$	A			1.3	V
dv/dt	Peak Diode Recovery					5	V/ns
t _{rr}	Reverse Recovery Time	$I_S = -149A$ $V_R = 250V$	$T_j = 25^{\circ}C$			250	ns
c _{II}	The verse receivery Time		$T_j = 125^{\circ}C$			500	113
	Daniera Danasa Chausa	$I_{S} = -149A$	$T_j = 25^{\circ}C$		10.4		
Q _{rr}	Reverse Recovery Charge	$V_R = 250V$ $di_S/dt = 800A/\mu s$	$T_j = 125^{\circ}C$		36		μС

• dv/dt numbers reflect the limitations of the circuit rather than the device itself.

 $I_S \le -149A$ di/dt $\le 700A/\mu s$ $V_R \le V_{DSS}$ $T_j \le 150$ °C



APTM50AM25FT

Thermal and package characteristics

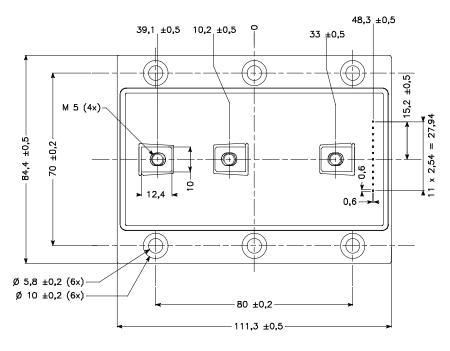
Symbol	Characteristic		Min	Typ	Max	Unit	
R_{thJC}	Junction to Case				0.1	°C/W	
V_{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I isol<1mA, 50/60Hz		2500			V	
T_{J}	Operating junction temperature range		-40		150		
T _{STG}	Storage Temperature Range			-40		125	°C
$T_{\rm C}$	Operating Case Temperature			-40		100	
Torque	Mounting torque	To heatsink	M5	2		3.5	N.m
Torque		For terminals	M5	2	3.5	3.5	11.111
Wt	Package Weight				550	g	

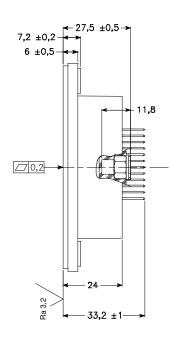
Temperature sensor NTC

Symbol	Characteristic	Min	Тур	Max	Unit
R ₂₅	Resistance @ 25°C		68		kΩ
B 25/85	$T_{25} = 298.16 \text{ K}$		4080		K

$$R_{T} = \frac{R_{25}}{\exp\left[B_{25/85}\left(\frac{1}{T_{25}} - \frac{1}{T}\right)\right]}$$
 T: Thermistor temperature R_T: Thermistor value at T

Package outline





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

APT's products are covered by one or more of U.S patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S and Foreign patents pending. All Rights Reserved.