Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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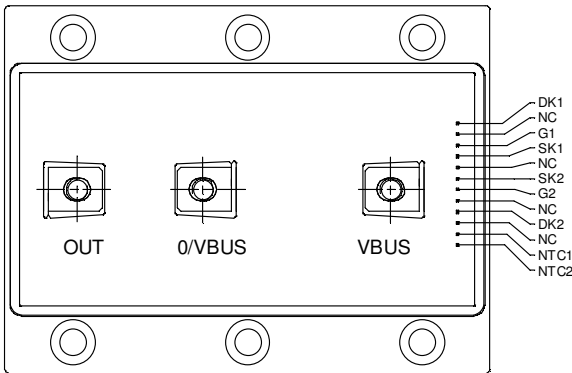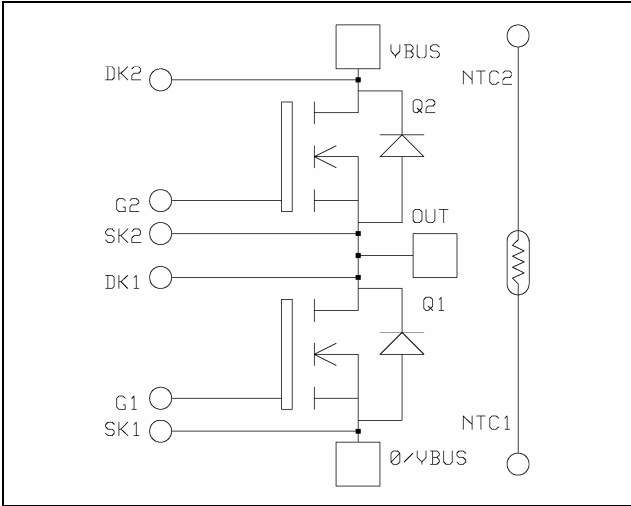Email & Skype: info@chipsmall.com Web: www.chipsmall.com
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APTM20AM05FT

Phase leg MOSFET Power Module

$V_{DSS} = 200V$
$R_{DSon} = 5m\Omega$ max @ Tj = 25°C
$I_D = 333A$ @ Tc = 25°C

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

Absolute maximum ratings

Symbol	Parameter		Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage		200	V
I_D	Continuous Drain Current	$T_c = 25°C$	333	
		$T_c = 80°C$	249	A
I_{DM}	Pulsed Drain current		700	
V_{GS}	Gate - Source Voltage		±30	V
R_{DSon}	Drain - Source ON Resistance		5	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25°C$	1250	W
I_{AR}	Avalanche current (repetitive and non repetitive)		333	A
E_{AR}	Repetitive Avalanche Energy		30	
E_{AS}	Single Pulse Avalanche Energy		1300	mJ

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

Electrical Characteristics

All ratings @ $T_j = 25°C$ unless otherwise specified

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
BV_{DSS}	Drain - Source Breakdown Voltage	$V_{GS} = 0V$, $I_D = 1mA$		200			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V$, $V_{DS} = 200V$	$T_j = 25°C$			1000	μA
		$V_{GS} = 0V$, $V_{DS} = 160V$	$T_j = 125°C$			2500	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V$, $I_D = 166.5A$				5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 8mA$		2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = ±30 V$, $V_{DS} = 0V$				±250	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		40.8		nF
C_{oss}	Output Capacitance	$V_{DS} = 25V$		9.1		
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$		3.1		
Q_g	Total gate Charge	$V_{GS} = 10V$		1184		nC
Q_{gs}	Gate – Source Charge	$V_{Bus} = 100V$		376		
Q_{gd}	Gate – Drain Charge	$I_D = 333A$		600		
$T_{d(on)}$	Turn-on Delay Time	**Resistive Switching**		15		ns
T_r	Rise Time	$V_{GS} = 15V$		25		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 100V$ $I_D = 333A$		50		
T_f	Fall Time	$R_G = 0.22 Ω$		10		

Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I_S	Continuous Source current (Body diode)		$Tc = 25°C$			333	A
			$Tc = 80°C$			249	
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V$, $I_S = - 333A$				1.3	V
dv/dt	Peak Diode Recovery ❶					8	V/ns
t_{rr}	Reverse Recovery Time	$I_S = - 333A$ $V_R = 100V$ $di_S/dt = 800A/μs$	$T_j = 25°C$			240	ns
			$T_j = 125°C$			420	
Q_{rr}	Reverse Recovery Charge	$I_S = - 333A$ $V_R = 100V$ $di_S/dt = 800A/μs$	$T_j = 25°C$		8		μC
			$T_j = 125°C$		16		

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

$I_S ≤ - 333A$ $di/dt ≤ 700A/μs$ $V_R ≤ V_{DSS}$ $T_j ≤ 150°C$

Thermal and package characteristics

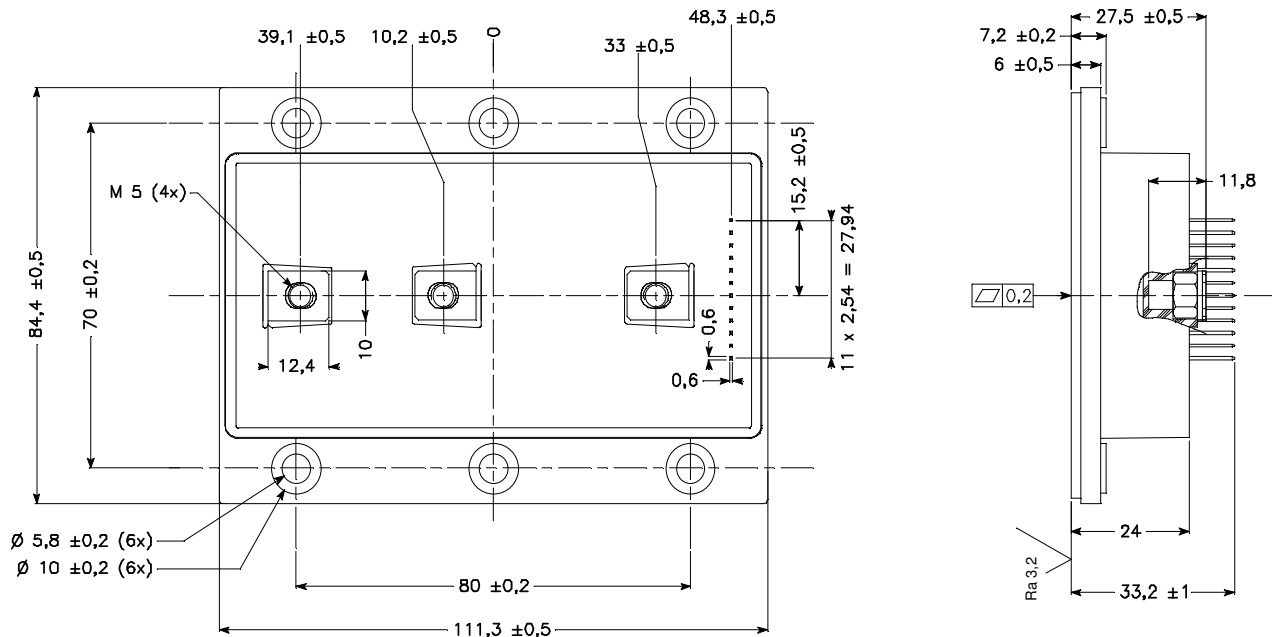| Symbol	Characteristic			Min	Typ	Max	Unit
R_{thJC}	Junction to Case					0.1	°C/W
V_{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, I isol<1mA, 50/60Hz			2500			V
T_J	Operating junction temperature range			-40		150	
T_{STG}	Storage Temperature Range			-40		125	°C
T_C	Operating Case Temperature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

Temperature sensor NTC

Symbol	Characteristic	Min	Typ	Max	Unit
R_{25}	Resistance @ 25°C		68		kΩ
$B_{25/85}$	T_{25} = 298.16 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 website – http://www.advancedpower.com