AAT9055
30V N-Channel Power MOSFET

PWMSwitch™

General Description

The AAT9055 30 V N-Channel Power MOSFET is a member of AnalogicTech™'s TrenchDMOS™ product family. Using the ultra-high density proprietary TrenchDMOS technology, this product demonstrates high power handling and small size.

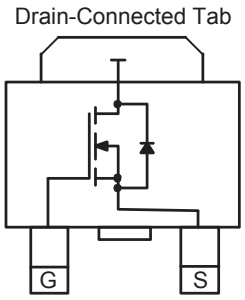
Features

- $V_{DS(MAX)}$ = 30V
- $I_{D(MAX)}$ [1] = 12 A @ T_C = 25°C
- $I_{APP(MAX)}$ = 6A in typical computer application
- Low $R_{DS(ON)}$:
  - 56 mΩ @V_{GS} = 10V
  - 90 mΩ @V_{GS} = 4.5V

Applications

- DC-DC converters
- High current load switches
- LDO output

DPAK Package



Preliminary Information

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Description		Value	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±20	
I_D	Continuous Drain Current @ T_J=150°C [1]	T_C = 25°C	±12	A
		T_C = 70°C	±10	
I_{DM}	Pulsed Drain Current [3]		±16	
I_S	Continuous Source Current (Source-Drain Diode) [1]		12	
P_D	Maximum Power Dissipation [1]	T_C = 25°C	22	W
		T_C = 70°C	14	
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Description	Value	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient	100	°C/W
R_{TYP}	Typical Junction to ambient on PC board [2]	28	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case	5.5	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Description	Conditions	Min	Typ	Max	Units
DC Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250µA	30			V
$R_{DS(ON)}$	Drain-Source ON-Resistance [3]	V_{GS}=10V, I_D=12A		44	56	mΩ
		V_{GS}=4.5V, I_D=10A		68	90	
$I_{D(ON)}$	On-State Drain Current [3]	V_{GS}=10V, V_{DS}=5V (Pulsed)	16			A
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250µA	1.0			V
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
I_{DSS}	Drain Source Leakage Current	V_{GS}=0V,V_{DS}=30V			1	µA
		V_{GS}=0V,V_{DS}=30V, T_J=70°C			25	
g_{fs}	Forward Transconductance [3]	V_{DS}=5V, I_D=4A		6		S
Dynamic Characteristics [4]						
Q_G	Total Gate Charge	V_{DS}=15V, R_D=2.5Ω, V_{GS}=5V		4.2		nC
Q_{GT}	Total Gate Charge	V_{DS}=15V, R_D=2.5Ω, V_{GS}=10V		7.7		
Q_{GS}	Gate-Source Charge	V_{DS}=15V, R_D=2.5Ω, V_{GS}=10V		1.35		
Q_{GD}	Gate-Drain Charge	V_{DS}=15V, R_D=2.5Ω, V_{GS}=10V		1.2		
$t_{D(ON)}$	Turn-ON Delay	V_{DD}=15V, R_D=2.5Ω, V_{GS}=10V, R_G=6Ω		2.5		ns
t_R	Turn-ON Rise Time	V_{DD}=15V, R_D=2.5Ω, V_{GS}=10V, R_G=6Ω		2.6		
$t_{D(OFF)}$	Turn-OFF Delay	V_{DD}=15V, R_D=2.5Ω, V_{GS}=10V, R_G=6Ω		12		
t_F	Turn-OFF Fall Time	V_{DD}=15V, R_D=2.5Ω, V_{GS}=10V, R_G=6Ω		5.7		
Source-Drain Diode Characteristics						
V_{SD}	Source-Drain Forward Voltage [3]	V_{GS}=0, I_S=12A		1.2	1.5	V
I_S	Continuous Diode Current [1]				12	A

Notes:

1. Based on thermal dissipation from junction to case. $R_{\theta JC}$ + $R_{\theta CA}$ = $R_{\theta JA}$ where the case thermal reference is defined as the solder mounting surface of the drain tab. $R_{\theta JC}$ is guaranteed by design, however $R_{\theta CA}$ is determined by the PCB design. Package current is limited to 8A DC and 16A pulsed.

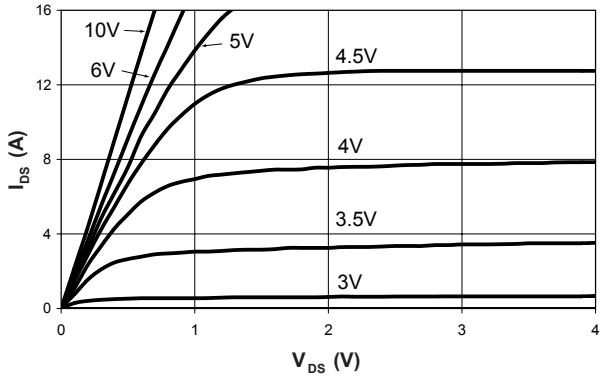
2. Mounted on typical computer main board.

3. Pulse measurement 300 µs.

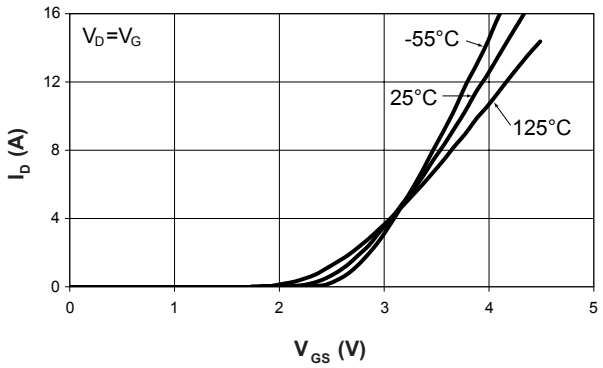
4. Guaranteed by design. Not subject to production testing.

Typical Characteristics

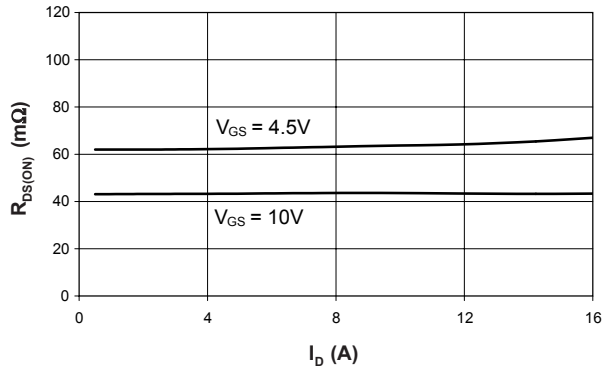
Output Characteristics



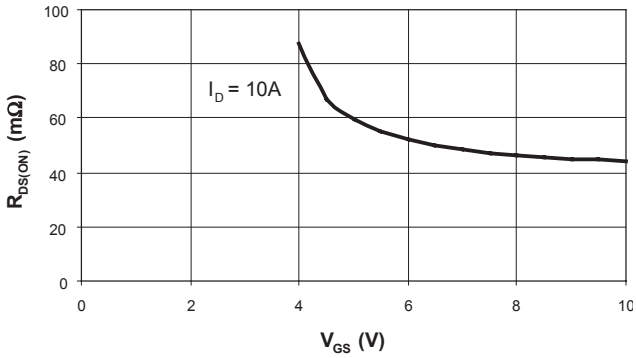
Transfer Characteristics



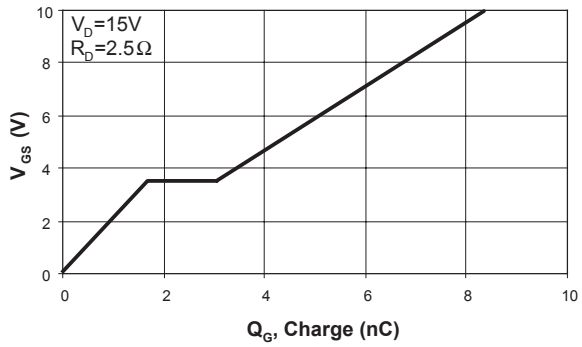
On-Resistance vs. Drain Current



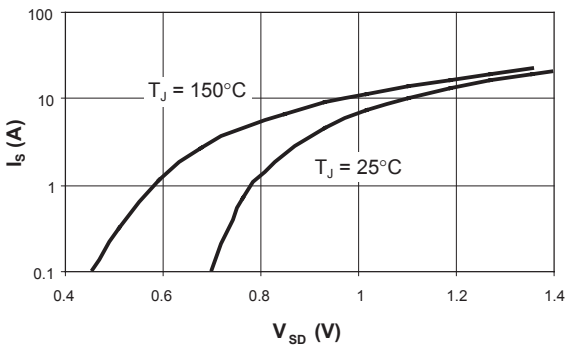
On-Resistance vs. Gate to Source Voltage



Gate Charge



Source-Drain Diode Forward Voltage



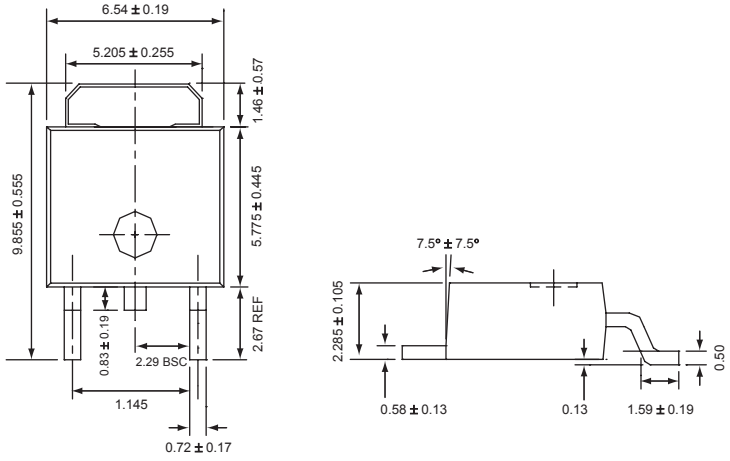
Ordering Information

Package	Marking	Part Number (Tape and Reel)
TO-252 (DPAK)	9055	**AAT9055INY-T1**

Note: Sample stock is generally held on all part numbers listed in **BOLD**.

Package Information

TO-252 (DPAK)



All measurements in millimeters.

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