



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.

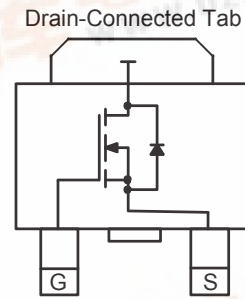
Features

- $V_{DS(MAX)} = 30V$
- $I_{D(MAX)}^1 = 12 A @ T_C = 25^\circ C$
- $I_{APP(MAX)} = 6A$ in typical computer application
- LOW $R_{DS(ON)}$:
 - $56 m\Omega @ V_{GS} = 10V$
 - $90 m\Omega @ V_{GS} = 4.5V$

Applications

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

DPAK Package



Absolute Maximum Ratings ($T_C=25^\circ C$ 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 @ $T_J=150^\circ C$ ¹	$T_C = 25^\circ C$	± 12
		$T_C = 70^\circ C$	± 10
I_{DM}	Pulsed Drain Current ³	± 16	A
I_S	Continuous Source Current (Source-Drain Diode) ¹	12	
P_D	Maximum Power Dissipation ¹	$T_C = 25^\circ C$	22
		$T_C = 70^\circ C$	14
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

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

Preliminary Information

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

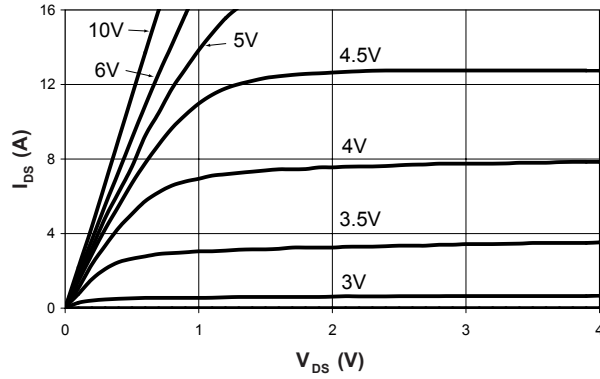
Symbol	Description	Conditions	Min	Typ	Max	Units
DC Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
R _{DS(ON)}	Drain-Source ON-Resistance ³	V _{GS} =10V, I _D =12A		44	56	mΩ
		V _{GS} =4.5V, I _D =10A		68	90	
I _{D(ON)}	On-State Drain Current ³	V _{GS} =10V, 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:

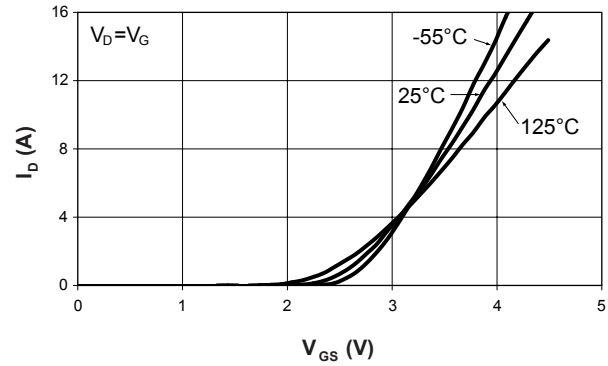
- Based on thermal dissipation from junction to case. $R_{\theta JC} + R_{\theta CA} = R_{\theta JA}$ where the case thermal reference is defined as the solder mounting surface of the drain tab. $R_{\theta JC}$ is guaranteed by design, however $R_{\theta CA}$ is determined by the PCB design. Package current is limited to 8A DC and 16A pulsed.
- Mounted on typical computer main board.
- Pulse measurement 300 μs.
- Guaranteed by design. Not subject to production testing.

Typical Characteristics

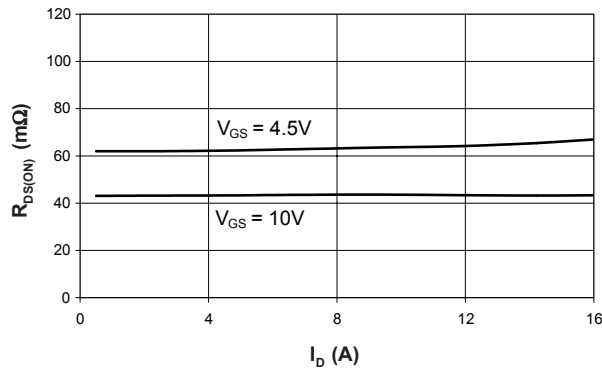
Output Characteristics



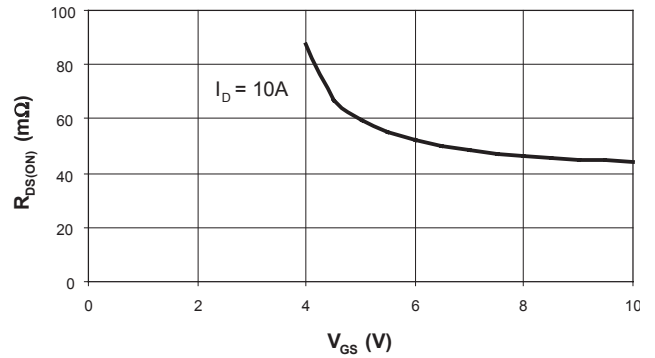
Transfer Characteristics



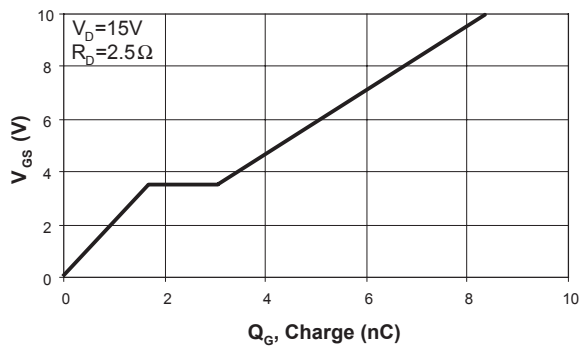
On-Resistance vs. Drain Current



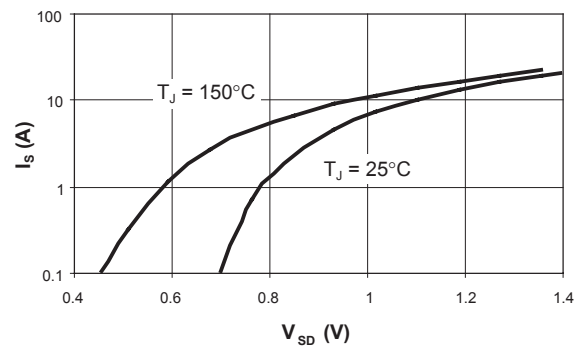
On-Resistance vs. Gate to Source Voltage



Gate Charge



Source-Drain Diode Forward Voltage



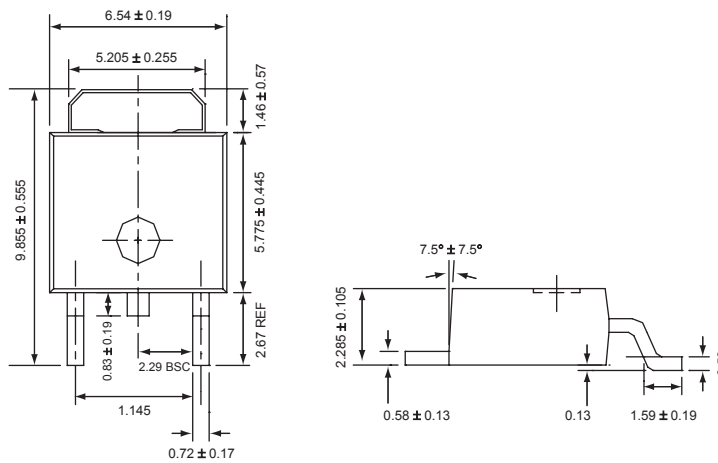
Ordering Information

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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