

### 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.

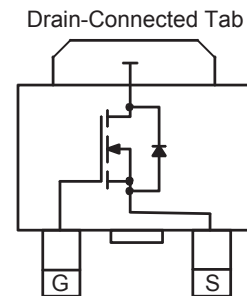
### Features

- $V_{DS(MAX)} = 30V$
- $I_{D(MAX)}^1 = 12 A @ T_C = 25^\circ C$
- $I_{APP(MAX)} = 6A$  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	$\pm 20$		
$I_D$	Continuous Drain Current @ $T_J=150^\circ C$ <sup>1</sup>	$T_C = 25^\circ C$	$\pm 12$	A
		$T_C = 70^\circ C$	$\pm 10$	
$I_{DM}$	Pulsed Drain Current <sup>3</sup>	$\pm 16$		
$I_S$	Continuous Source Current (Source-Drain Diode) <sup>1</sup>	12		
$P_D$	Maximum Power Dissipation <sup>1</sup>	$T_C = 25^\circ C$	22	W
		$T_C = 70^\circ C$	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 <sup>2</sup>	28	$^\circ C/W$
$R_{\theta JC}$	Maximum Junction-to-Case	5.5	$^\circ C/W$

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Symbol	Description	Conditions	Min	Typ	Max	Units
<b>DC Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
R <sub>DS(ON)</sub>	Drain-Source ON-Resistance <sup>3</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =12A		44	56	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A		68	90	
I <sub>D(ON)</sub>	On-State Drain Current <sup>3</sup>	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V (Pulsed)	16			A
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	1.0			V
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
I <sub>DSS</sub>	Drain Source Leakage Current	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V			1	μA
		V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, T <sub>J</sub> =70°C			25	
g <sub>fs</sub>	Forward Transconductance <sup>3</sup>	V <sub>DS</sub> =5V, I <sub>D</sub> =4A		6		S
<b>Dynamic Characteristics <sup>4</sup></b>						
Q <sub>G</sub>	Total Gate Charge	V <sub>DS</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =5V		4.2		nC
Q <sub>GT</sub>	Total Gate Charge	V <sub>DS</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V		7.7		
Q <sub>GS</sub>	Gate-Source Charge	V <sub>DS</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V		1.35		
Q <sub>GD</sub>	Gate-Drain Charge	V <sub>DS</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V		1.2		
t <sub>D(ON)</sub>	Turn-ON Delay	V <sub>DD</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		2.5		ns
t <sub>R</sub>	Turn-ON Rise Time	V <sub>DD</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		2.6		
t <sub>D(OFF)</sub>	Turn-OFF Delay	V <sub>DD</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		12		
t <sub>F</sub>	Turn-OFF Fall Time	V <sub>DD</sub> =15V, R <sub>D</sub> =2.5Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		5.7		
<b>Source-Drain Diode Characteristics</b>						
V <sub>SD</sub>	Source-Drain Forward Voltage <sup>3</sup>	V <sub>GS</sub> =0, I <sub>S</sub> =12A		1.2	1.5	V
I <sub>S</sub>	Continuous Diode Current <sup>1</sup>				12	A

Notes:

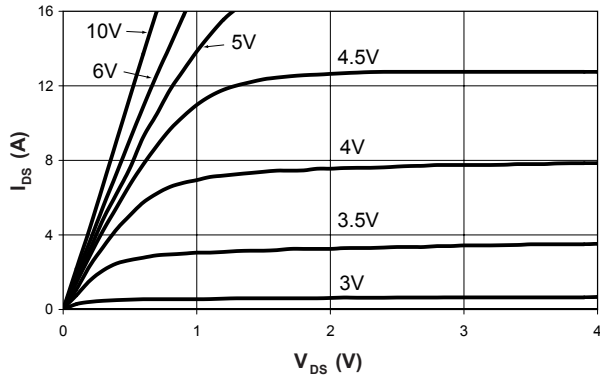
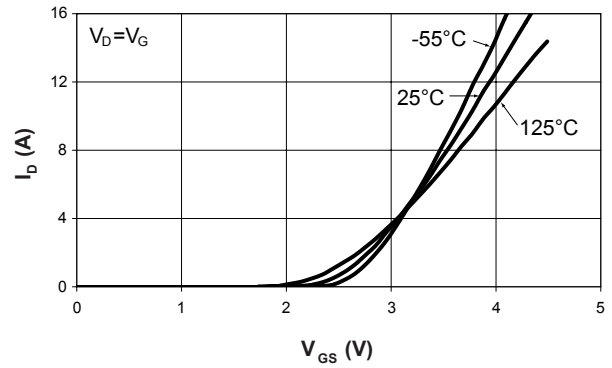
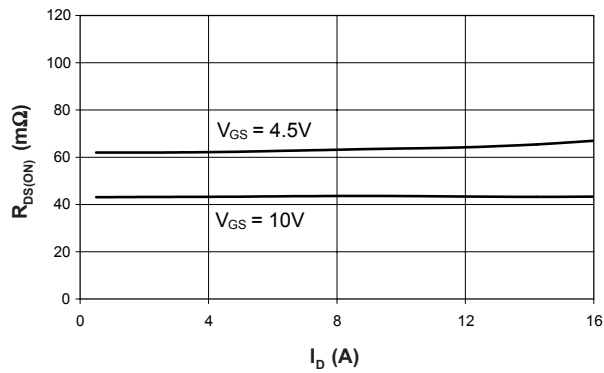
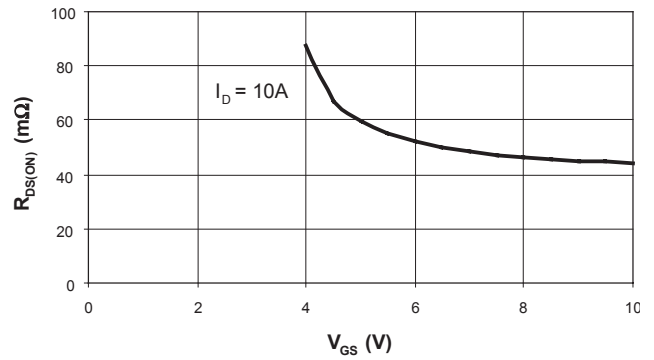
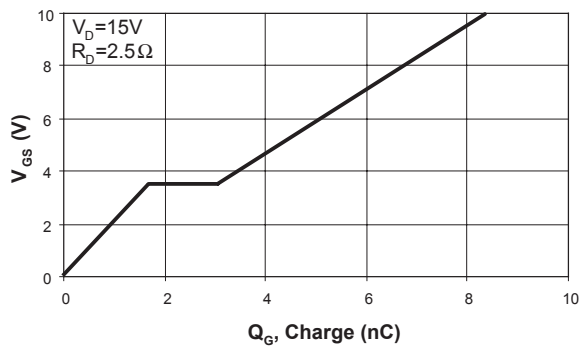
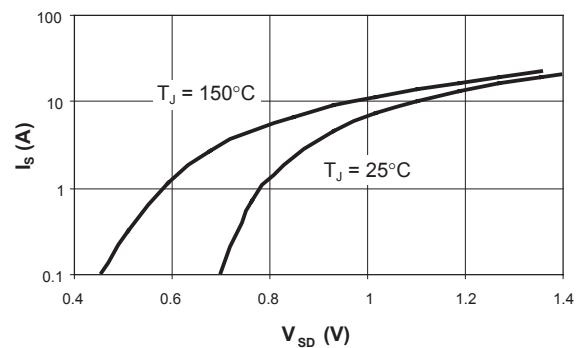
1. Based on thermal dissipation from junction to case. R<sub>θJC</sub> + R<sub>θCA</sub> = R<sub>θJA</sub> where the case thermal reference is defined as the solder mounting surface of the drain tab. R<sub>θJC</sub> is guaranteed by design, however R<sub>θCA</sub> is determined by the PCB design. Package 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**


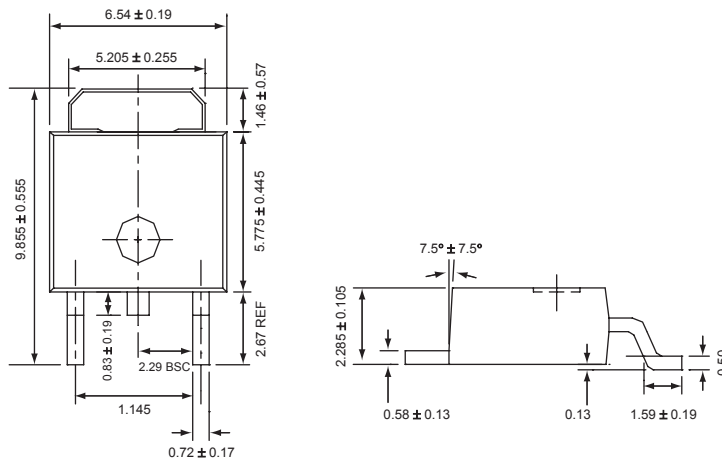
### Ordering Information

Package	Marking	Part Number (Tape and Reel)
TO-252 (DPAK)	9055	<b>AAT9055INY-T1</b>

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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