

General Description

The AAT9060 30V 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.

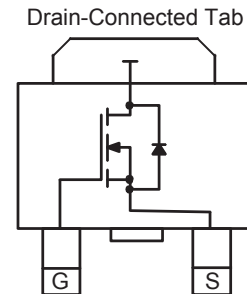
Features

- $V_{DS(MAX)} = 30V$
- $I_{D(MAX)}^1 = 39A @ T_C = 25^\circ C$
- $I_{APP(MAX)} = 12.5A$ in typical computer application
- LOW $R_{DS(ON)}$:
 - $16 m\Omega @ V_{GS} = 10V$
 - $27 m\Omega @ V_{GS} = 4.5V$

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	$T_C = 25^\circ C$	± 39	A
		$T_C = 70^\circ C$	± 31	
I_{DM}	Pulsed Drain Current ³	± 60		
I_S	Continuous Source Current (Source-Drain Diode) ¹	20		
P_D	Maximum Power Dissipation ¹	$T_C = 25^\circ C$	41	W
		$T_C = 70^\circ C$	26	
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	96	$^\circ C/W$
R_{TYP}	Typical Junction to ambient on PC board ²	24	$^\circ C/W$
$R_{\theta JC}$	Maximum Junction-to-Case	3	$^\circ C/W$

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 =25A		13	16	mΩ
		V _{GS} =4.5V, I _D =19A		21	27	
I _{D(ON)}	On-State Drain Current ³	V _{GS} =10V, V _{DS} =5V (Pulsed)	60			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 ⁴			25	
g _{fs}	Forward Transconductance ³	V _{DS} =5V, I _D =9A		20		S
Dynamic Characteristics ⁴						
Q _G	Total Gate Charge	V _{DS} =15V, R _D =1.3Ω, V _{GS} =5V		13	16	nC
Q _{GT}	Total Gate Charge	V _{DS} =15V, R _D =1.3Ω, V _{GS} =10V		25	32	
Q _{GS}	Gate-Source Charge	V _{DS} =15V, R _D =1.3Ω, V _{GS} =10V		4		
Q _{GD}	Gate-Drain Charge	V _{DS} =15V, R _D =1.3Ω, V _{GS} =10V		3.5		
t _{D(ON)}	Turn-ON Delay	V _{DD} =15V, R _D =1.3Ω, V _{GS} =10V, R _G =6Ω		12		ns
t _R	Turn-ON Rise Time	V _{DD} =15V, R _D =1.3Ω, V _{GS} =10V, R _G =6Ω		38		
t _{D(OFF)}	Turn-OFF Delay	V _{DD} =15V, R _D =1.3Ω, V _{GS} =10V, R _G =6Ω		21		
t _F	Turn-OFF Fall Time	V _{DD} =15V, R _D =1.3Ω, V _{GS} =10V, R _G =6Ω		32		
Source-Drain Diode Characteristics						
V _{SD}	Source-Drain Forward Voltage ³	V _{GS} =0, I _S =20A			2	V
I _S	Continuous Diode Current ¹				20	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 30A DC and 60A pulsed.

2. Mounted on typical computer main board.

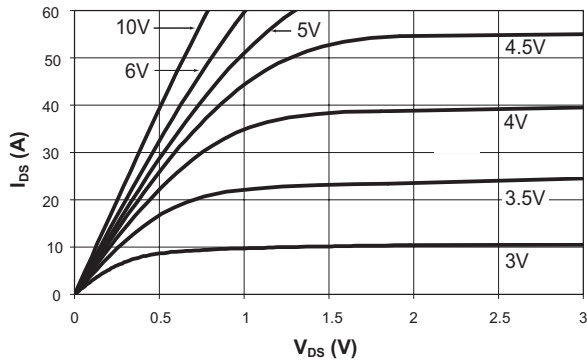
3. Pulse measurement 300 μs.

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

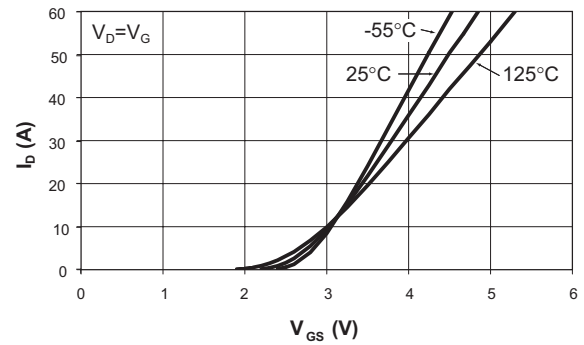
Typical Characteristics

($T_J = 25^\circ\text{C}$ unless otherwise noted)

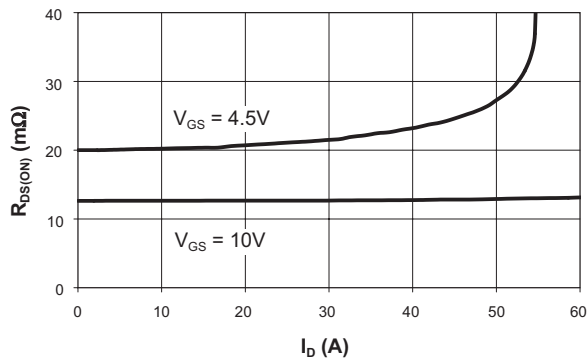
Output Characteristics



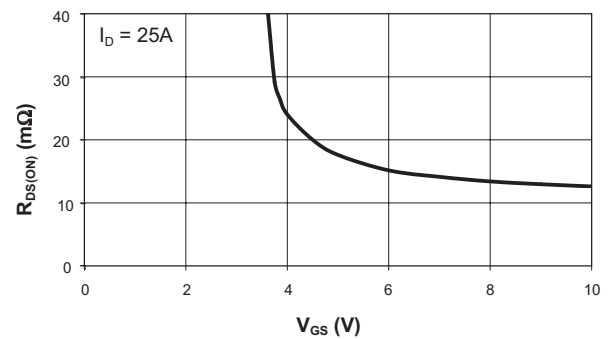
Transfer Characteristics



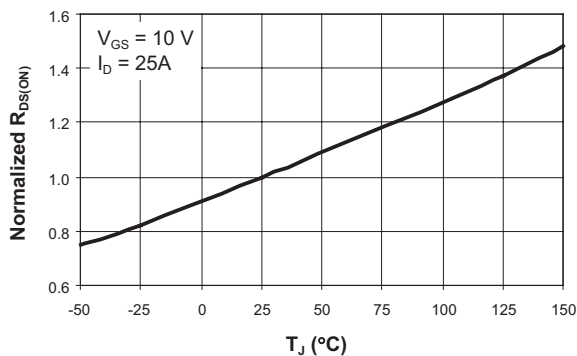
On-Resistance vs. Drain Current



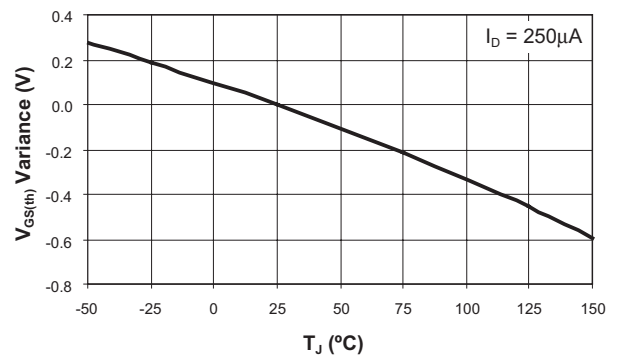
On-Resistance vs. Gate to Source Voltage



On-Resistance vs. Junction Temperature



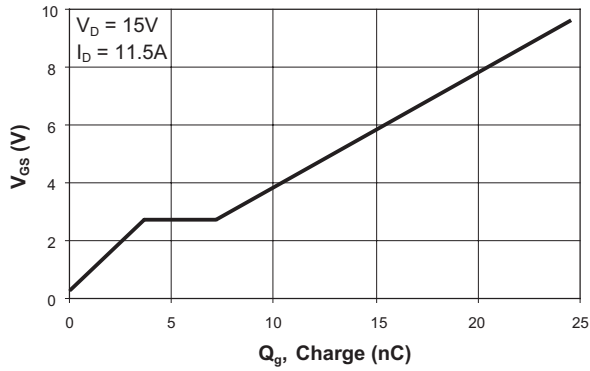
Threshold Voltage



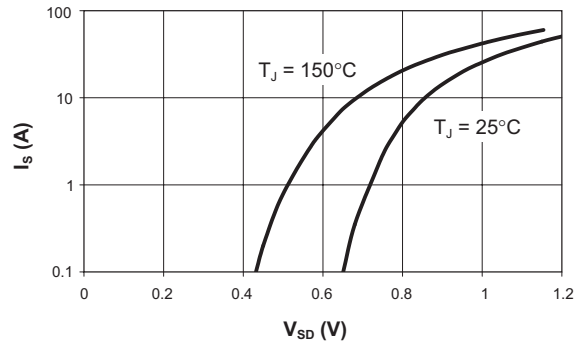
Typical Characteristics

($T_J = 25^\circ\text{C}$ unless otherwise noted)

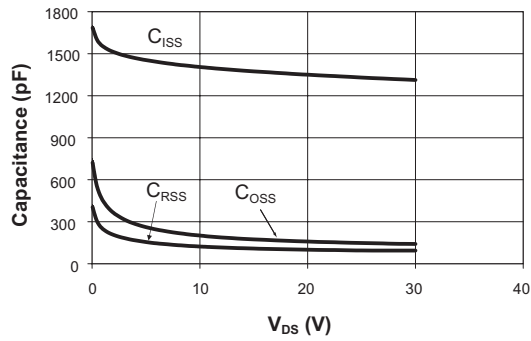
Gate Charge



Source-Drain Diode Forward Voltage



Capacitance



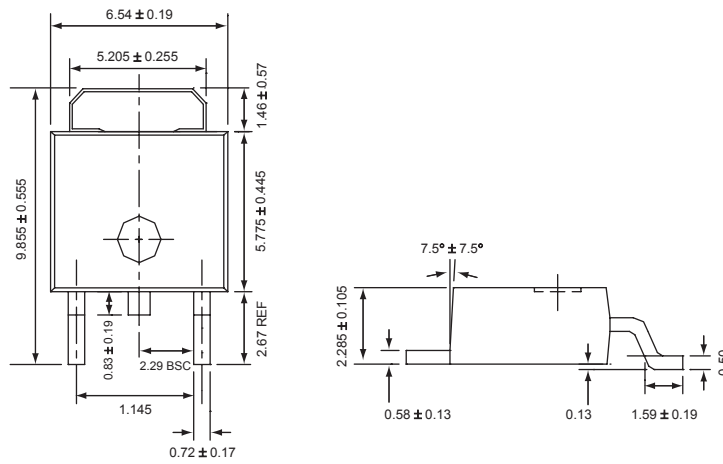
Ordering Information

Package	Marking	Part Number (Tape and Reel)
TO-252 (DPAK)	9060	AAT9060INY-T1

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

Package Information

TO-252 (DPAK)



All dimensions in millimeters.

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