

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.

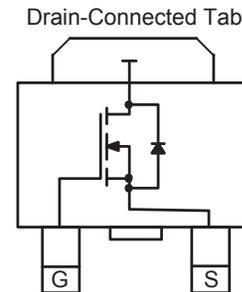
Features

- $V_{DS(MAX)} = 30V$
- $I_{D(MAX)}^1 = 39A @ T_C = 25^\circ C$
- $I_{APP(MAX)} = 12.5A$ 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

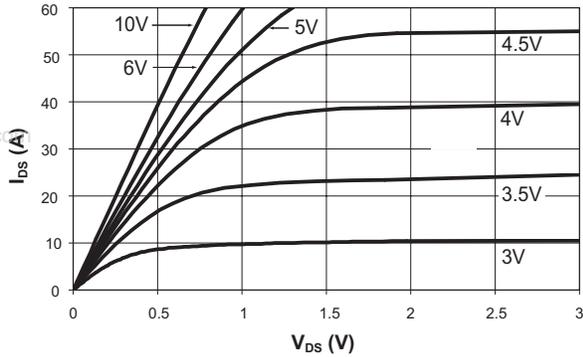
Notes:

- 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.
- Mounted on typical computer main board.
- Pulse measurement 300 μs.
- Guaranteed by design. Not subject to production testing.

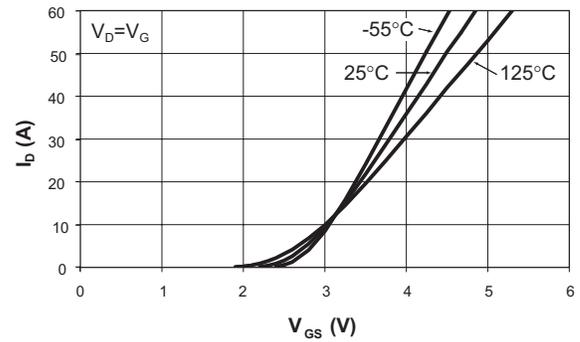
Typical Characteristics

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

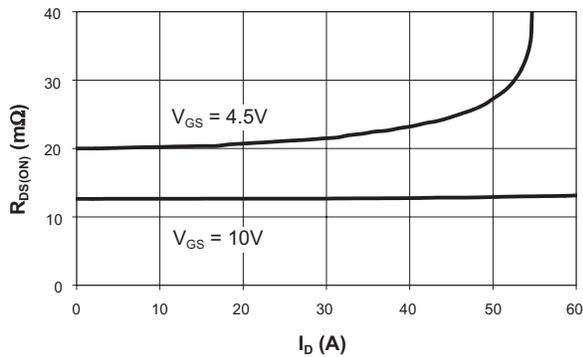
Output Characteristics



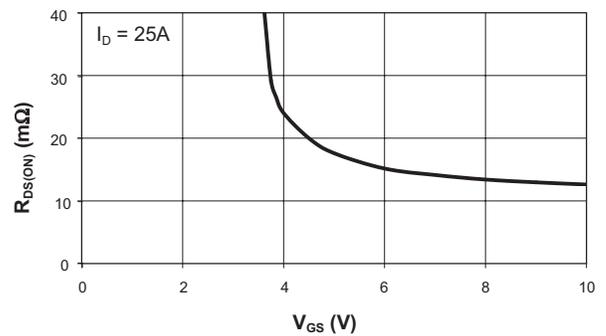
Transfer Characteristics



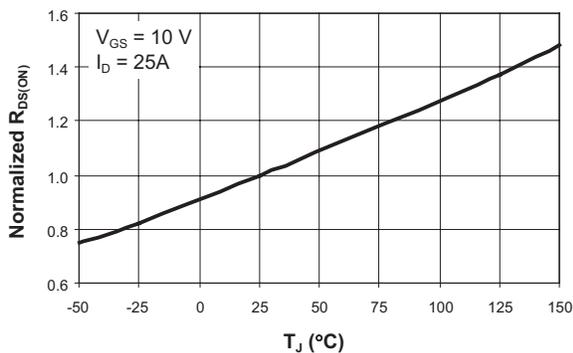
On-Resistance vs. Drain Current



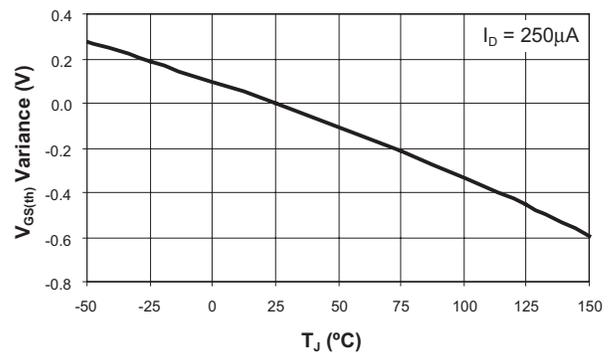
On-Resistance vs. Gate to Source Voltage



On-Resistance vs. Junction Temperature



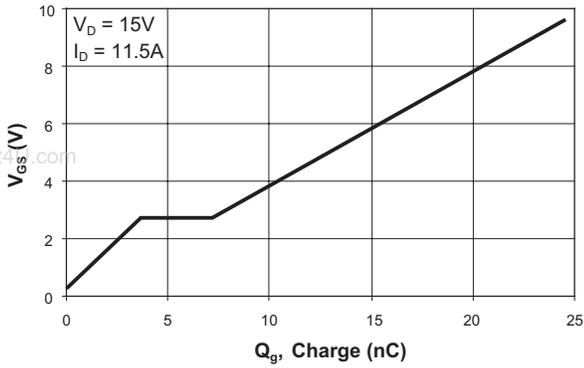
Threshold Voltage



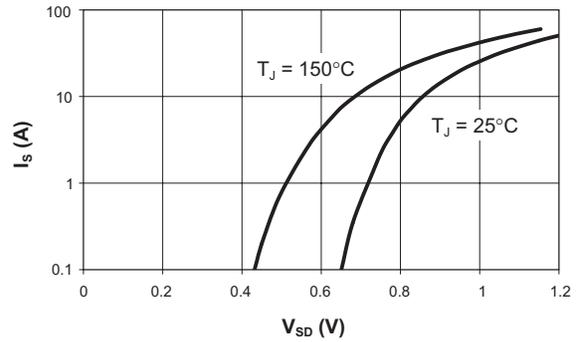
Typical Characteristics

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

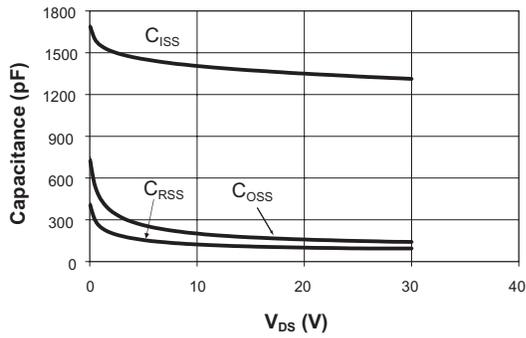
Gate Charge



Source-Drain Diode Forward Voltage



Capacitance



Ordering Information

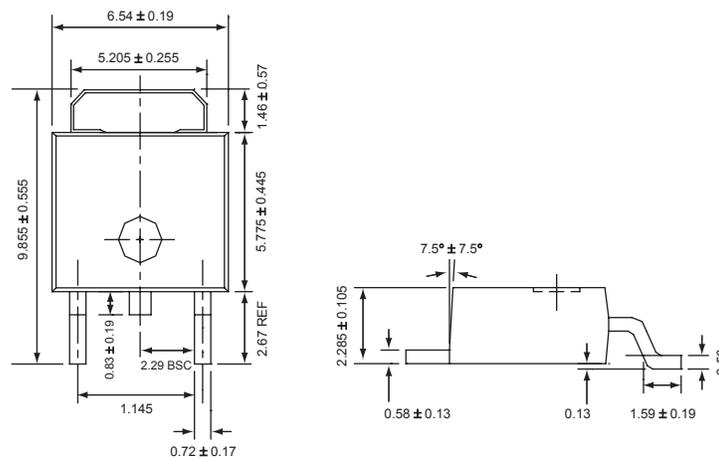
Package	Marking	Part Number (Tape and Reel)
TO-252 (DPAK)	9060	AAT9060INY-T1

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

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Package Information

TO-252 (DPAK)



All dimensions in millimeters.

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