

General Description

The AAT9460 is a low threshold MOSFET designed for applications in DC-DC Converter, battery, cell phone, and PDA markets. Using AnalogicTech™'s ultra-high density proprietary TrenchDMOS™ technology, this product demonstrates high power handling and small size.

Features

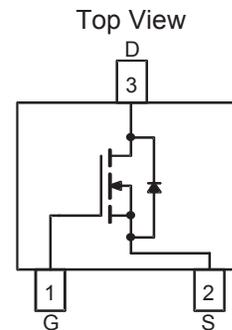
- $V_{DS(MAX)} = 30V$
- $I_{D(MAX)}^1 = 3.4A @ 25^{\circ}C$
- Low $R_{DS(ON)}$:
 - $58 m\Omega @ V_{GS} = 4.5V$
 - $84 m\Omega @ V_{GS} = 2.5V$

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Applications

- DC-DC Converters
- Battery Packs
- Cellular & Cordless Telephones
- Battery-powered portable equipment

SC59 Package



Preliminary Information

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Symbol	Description	Value	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	
I_D	Continuous Drain Current @ $T_J=150^{\circ}C$ ¹	$T_A = 25^{\circ}C$	± 3.4
		$T_A = 70^{\circ}C$	± 2.7
I_{DM}	Pulsed Drain Current ²	± 8.0	A
I_S	Continuous Source Current (Source-Drain Diode) ¹	1.0	
P_D	Maximum Power Dissipation ¹	$T_A = 25^{\circ}C$	1.1
		$T_A = 70^{\circ}C$	0.7
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^{\circ}C$

Thermal Characteristics

Symbol	Description	Value	Units
$R_{\theta JA}$	Typical Junction-to-Ambient steady state ¹	140	$^{\circ}C/W$
$R_{\theta JA2}$	Maximum Junction-to-Ambient $t < 5$ seconds ¹	115	
$R_{\theta JF}$	Typical Junction-to-Foot ¹	45	

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 ²	V _{GS} =-4.5V, I _D =3.4A		46	58	mΩ
		V _{GS} =-2.5V, I _D =2.8A		65	84	
I _{D(ON)}	On-State Drain Current ²	V _{GS} =4.5V, V _{DS} =5V (Pulsed)	8			A
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	0.6			V
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V			±100	nA
I _{DSS}	Drain Source Leakage Current	V _{GS} =0V, V _{DS} =30V			1	μA
		V _{GS} =0V, V _{DS} =24V, T _J =70°C ³			5	
g _{fs}	Forward Transconductance ²	V _{DS} =-5V, I _D =3.4A		9		S
Dynamic Characteristics ³						
Q _G	Total Gate Charge	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V		5		nC
Q _{GS}	Gate-Source Charge	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V		0.9		
Q _{GD}	Gate-Drain Charge	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V		1		
t _{D(ON)}	Turn-ON Delay	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V, R _G =6Ω		6		ns
t _R	Turn-ON Rise Time	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V, R _G =6Ω		3		
t _{D(OFF)}	Turn-OFF Delay	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V, R _G =6Ω		30		
t _F	Turn-OFF Fall Time	V _{DS} =15V, R _D =4.2Ω, V _{GS} =4.5V, R _G =6Ω		8		
Source-Drain Diode Characteristics						
V _{SD}	Source-Drain Forward Voltage ²	V _{GS} =0, I _S =3.4A			1.3	V
I _S	Continuous Diode Current ¹				1.0	A

Note 1: Based on thermal dissipation from junction to ambient while mounted on a 1" x 1" PCB with optimized layout. A 5 second pulse on a 1" x 1" PCB approximates testing a device mounted on a large multi-layer PCB as in many applications. $R_{\theta JF} + R_{\theta FA} = R_{\theta JA}$ where the foot thermal reference is defined as the normal solder mounting surface of the device's leads. $R_{\theta JF}$ is guaranteed by design; however, $R_{\theta FA}$ is determined by PCB design. Actual maximum continuous current is limited by the application's design.

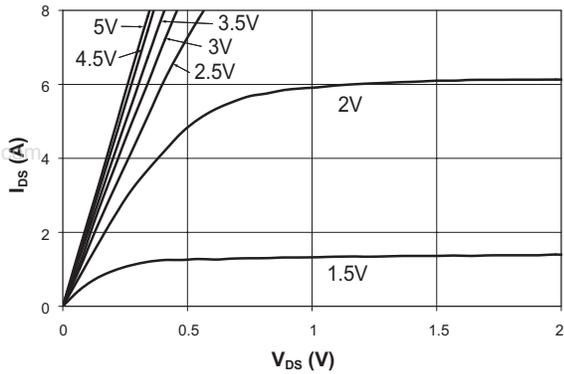
Note 2: Pulse test: Pulse width = 300 μs.

Note 3: Guaranteed by design. Not subject to production testing.

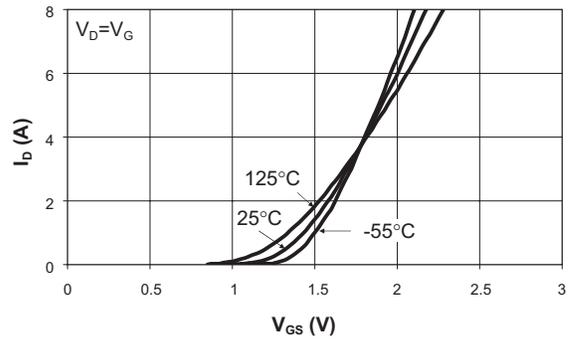
Typical Characteristics

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

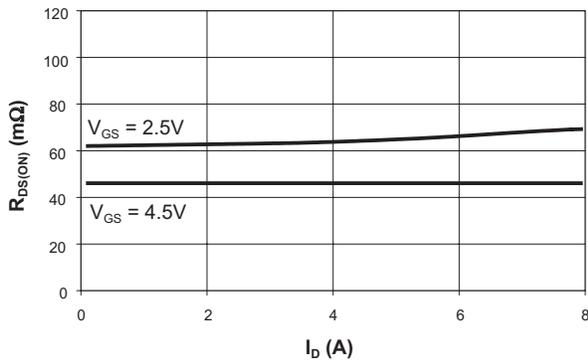
Output Characteristics



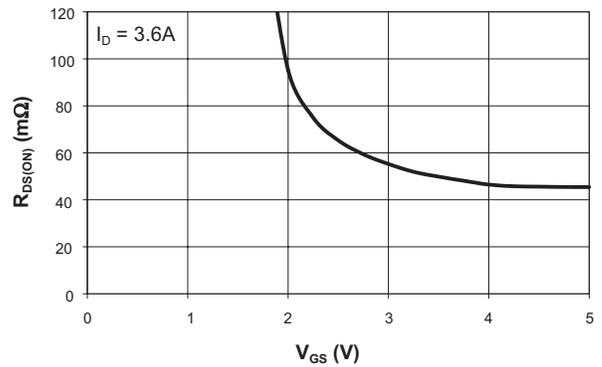
Transfer Characteristics



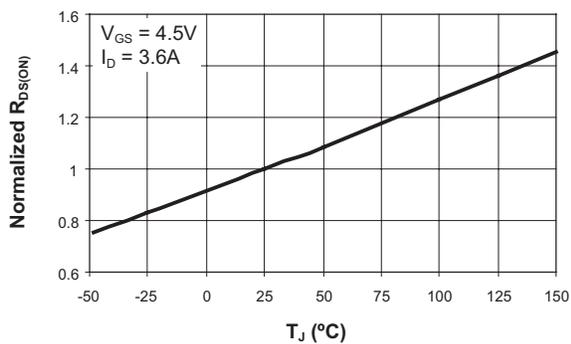
On-Resistance vs. Drain Current



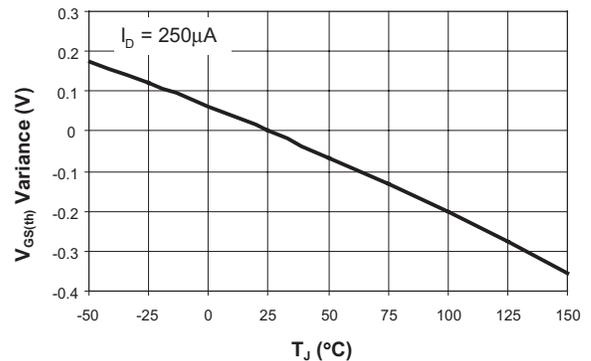
On-Resistance vs. Gate to Source Voltage



On-Resistance vs. Junction Temperature



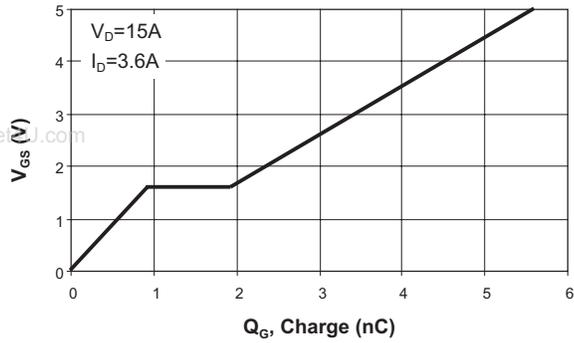
Threshold Voltage



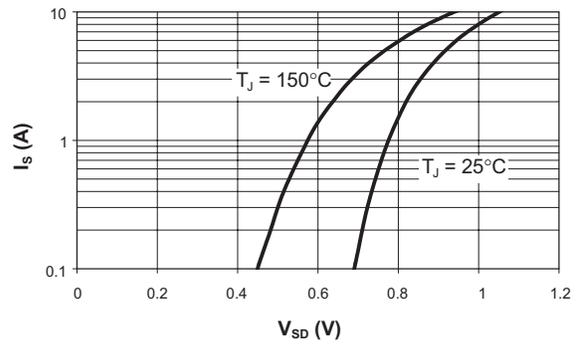
Typical Characteristics

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

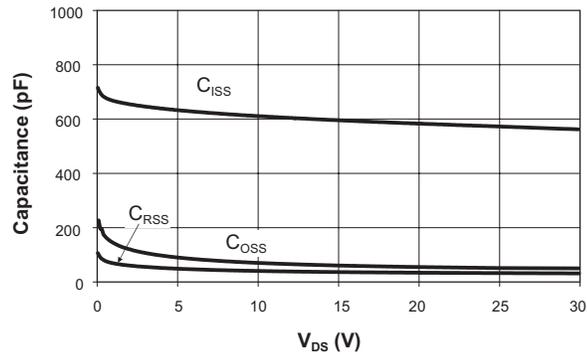
Gate Charge



Source-Drain Diode Forward Voltage



Capacitance

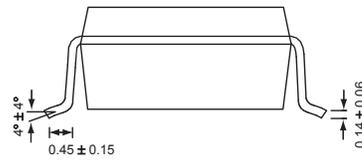
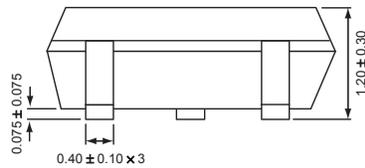
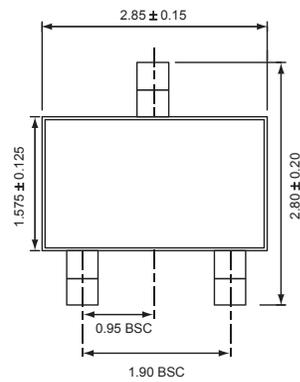


Ordering Information

Package	Marking	Part Number (Tape and Reel)
SC59	HA	AAT9460IGY-T1

Package Information

SC59



All dimensions in millimeters.

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