

General Description

The AAT9501 is a low threshold MOSFET designed for the battery, cell phone, and PDA markets. Using AnalogicTech™'s ultra high density MOSFET process and space saving small outline J-lead package, performance superior to that normally found in a TSOP-6 footprint has been squeezed into the footprint of a SC70 package.

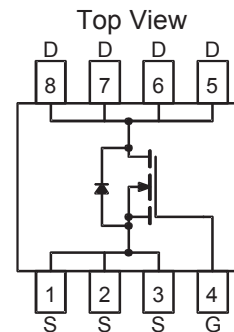
Features

- $V_{DS(MAX)} = 25V$
- $I_{D(MAX)}^1 = 6.5A @ 25^{\circ}C$
- Low $R_{DS(ON)}$:
 - $24 m\Omega @ V_{GS} = 4.5V$
 - $40 m\Omega @ V_{GS} = 2.5V$

Applications

- Battery packs
- Cellular & Cordless Telephones
- Battery-powered portable equipment

SC70JW-8 Package



Preliminary Information

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

Symbol	Description	Value	Units	
V_{DS}	Drain-Source Voltage	25	V	
V_{GS}	Gate-Source Voltage	± 12		
I_D	Continuous Drain Current @ $T_J=150^{\circ}C$ ¹	$T_A = 25^{\circ}C$	± 6.5	A
		$T_A = 70^{\circ}C$	± 5.2	
I_{DM}	Pulsed Drain Current	± 32		
I_S	Continuous Source Current (Source-Drain Diode) ¹	1.5		
P_D	Maximum Power Dissipation ¹	$T_A = 25^{\circ}C$	1.7	W
		$T_A = 70^{\circ}C$	1.0	
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^{\circ}C$	

Thermal Characteristics

Symbol	Description	Typ	Max	Units
$R_{\theta JA}$	Junction-to-Ambient steady state ¹	100	120	$^{\circ}C/W$
$R_{\theta JA2}$	Junction-to-Ambient, $t < 5$ sec. ¹	61	73.5	
$R_{\theta JF}$	Junction-to-Foot ¹	33	40	

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	25			V
R _{DS(ON)}	Drain-Source ON-Resistance ²	V _{GS} =4.5V, I _D =6.5A		19	24	mΩ
		V _{GS} =2.5V, I _D =5.0A		31	40	
I _{D(ON)}	On-State Drain Current ²	V _{GS} =4.5V, V _{DS} =5V (Pulsed)	32			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} =25V			1	μA
		V _{GS} =0V, V _{DS} =20V, T _J =70°C ³			5	
g _{fs}	Forward Transconductance ²	V _{DS} =5V, I _D =6.5A		17		S
Dynamic Characteristics ³						
Q _G	Total Gate Charge	V _{DS} =15V, R _D =2.7Ω, V _{GS} =4.5V		13	19	nC
Q _{GS}	Gate-Source Charge	V _{DS} =15V, R _D =2.7Ω, V _{GS} =4.5V		1.9		
Q _{GD}	Gate-Drain Charge	V _{DS} =15V, R _D =2.7Ω, V _{GS} =4.5V		2.9		
t _{D(ON)}	Turn-ON Delay	V _{DD} =15V, V _{GS} =4.5V, R _D =2.7Ω, R _G =6Ω		15		ns
t _R	Turn-ON Rise Time	V _{DD} =15V, V _{GS} =4.5V, R _D =2.7Ω, R _G =6Ω		18		
t _{D(OFF)}	Turn-OFF Delay	V _{DD} =15V, V _{GS} =4.5V, R _D =2.7Ω, R _G =6Ω		36		
t _F	Turn-OFF Fall Time	V _{DD} =15V, V _{GS} =4.5V, R _D =2.7Ω, R _G =6Ω		27		
Source-Drain Diode Characteristics						
V _{SD}	Source-Drain Forward Voltage ²	V _{GS} =0, I _S =6.5A			1.3	V
I _S	Continuous Diode Current ¹				1.5	A

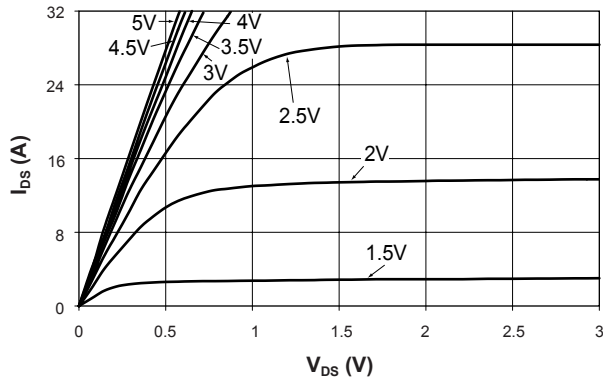
Notes:

- 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_{θJF} + R_{θFA} = R_{θJA} where the foot thermal reference is defined as the normal solder mounting surface of the device's leads. R_{θJF} is guaranteed by design, however R_{θCA} is determined by the PCB design. Actual maximum continuous current is limited by the application's design.
- Pulse test: Pulse Width = 300 μs
- Guaranteed by design. Not subjected to production testing.

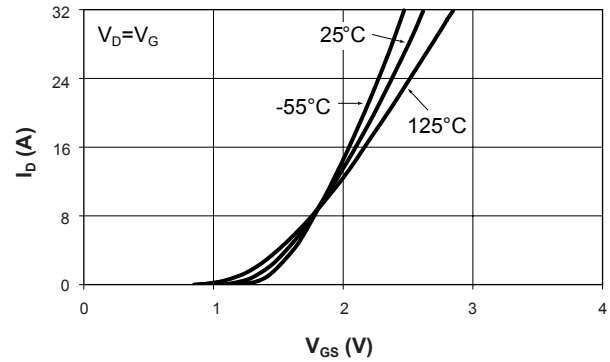
Typical Characteristics

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

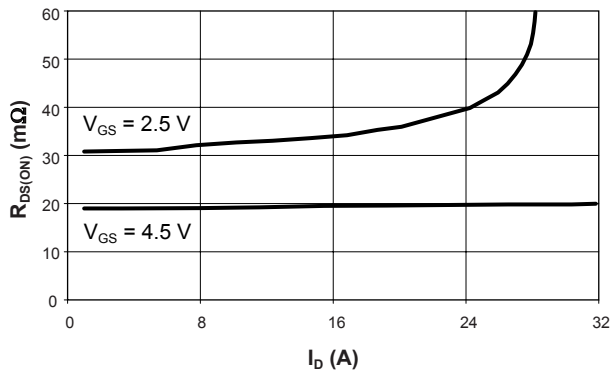
Output Characteristics



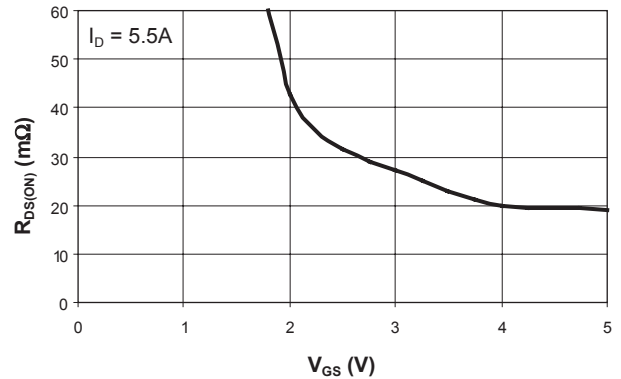
Transfer Characteristics



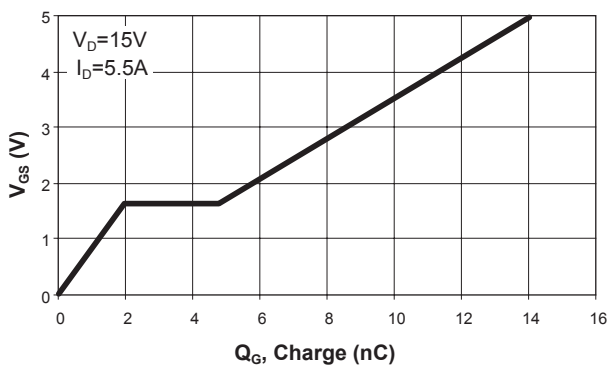
On-Resistance vs. Drain Current



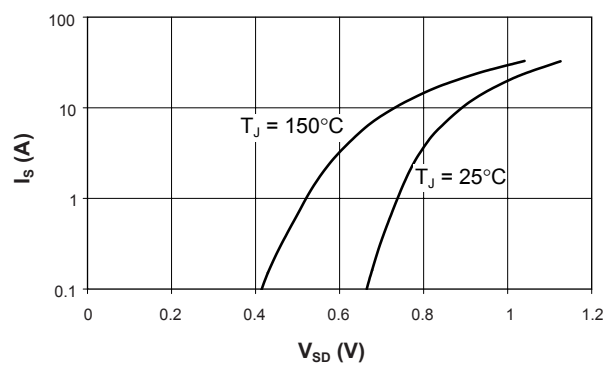
On-Resistance vs. Gate to Source Voltage



Gate Charge



Source-Drain Diode Forward Voltage



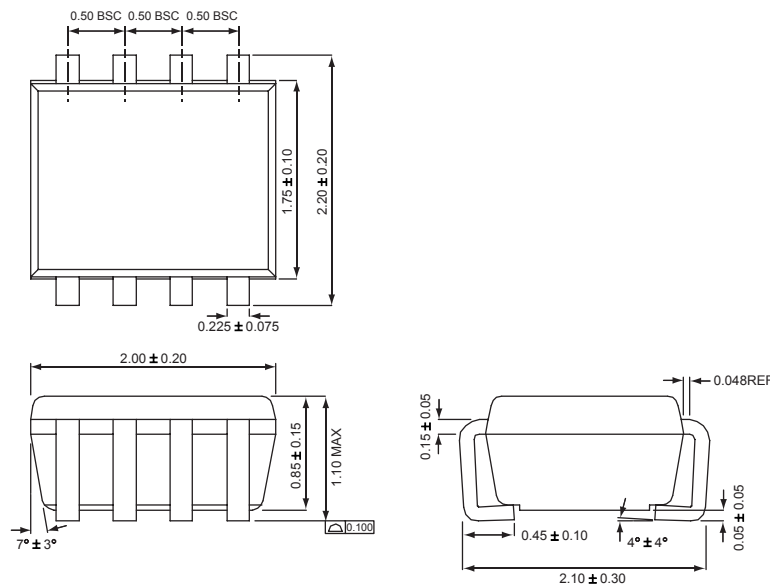
Ordering Information

Package	Marking ¹	Part Number (Tape and Reel)
SC70JW-8	FEXYY	AAT9501IJS-T1

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

Note 1: XYY = assembly and date code.

Package Information



All dimensions in millimeters.

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Advanced Analogic Technologies, Inc.
 830 E. Arques Avenue, Sunnyvale, CA 94085
 Phone (408) 737-4600
 Fax (408) 737-4611