ANALOGIC™ TECH

AAT7361

20V P-Channel Power MOSFET

Preliminary Information

General Description

The AAT7361 is a low threshold dual 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 larger footprint has been squeezed into the footprint of a TSOP6 package.

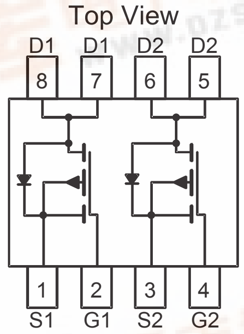
Features

- $V_{DS(MAX)}$ = -20V
- $I_{D(MAX)}$ [1] = -3.0A @ 25°C
- Low $R_{DS(ON)}$:
  - 100 mΩ @ V_{GS} = -4.5V
  - 175 mΩ @ V_{GS} = -2.5V

Applications

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

Dual TSOPJW-8 Package



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Description		Value	Units
V_{DS}	Drain-Source Voltage		-20	V
V_{GS}	Gate-Source Voltage		±12	
I_D	Continuous Drain Current @ T_J=150°C [1]	T_A = 25°C	±3.0	A
		T_A = 70°C	±2.4	
I_{DM}	Pulsed Drain Current [2]		±9	
I_S	Continuous Source Current (Source-Drain Diode) [1]		-1.0	
P_D	Maximum Power Dissipation [1]	T_A = 25°C	1.4	W
		T_A = 70°C	0.9	
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Description	Typ	Max	Units
$R_{\theta JA}$	Junction-to-Ambient steady state, one FET on [1]	124	155	°C/W
$R_{\theta JA2}$	Junction-to-Ambient t<5 seconds [1]	74	90	°C/W
$R_{\theta JF}$	Junction-to-Foot [1]	66	80	°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	-20			V
$R_{DS(ON)}$	Drain-Source ON-Resistance [2]	V_{GS}=-4.5V, I_D=-3.0A		80	100	mΩ
		V_{GS}=-2.5V, I_D=-2.3A		140	175	
$I_{D(ON)}$	On-State Drain Current [2]	V_{GS}=-4.5V, V_{DS}=-5V (Pulsed)	-9			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}=-20V			-1	μA
		V_{GS}=0V, V_{DS}=-16V, T_J=70°C [3]			-5	
g_{fs}	Forward Transconductance [2]	V_{DS}=-5V, I_D=-3.0A		5		S
Dynamic Characteristics [3]						
Q_G	Total Gate Charge	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V		6		nC
Q_{GS}	Gate-Source Charge	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V		1.3		
Q_{GD}	Gate-Drain Charge	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V		1.7		
$t_{D(ON)}$	Turn-ON Delay	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V, R_G=6Ω		7		ns
t_R	Turn-ON Rise Time	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V, R_G=6Ω		13		
$t_{D(OFF)}$	Turn-OFF Delay	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V, R_G=6Ω		15		
t_F	Turn-OFF Fall Time	V_{DS}=-10V, R_D=3.3Ω, V_{GS}=-4.5V, R_G=6Ω		20		
Source-Drain Diode Characteristics						
V_{SD}	Source-Drain Forward Voltage [2]	V_{GS}=0, I_S=-3.0A			-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 most 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 $R_{\theta CA}$ is determined by the PCB design. Actual maximum continuous current is limited by the application's design.

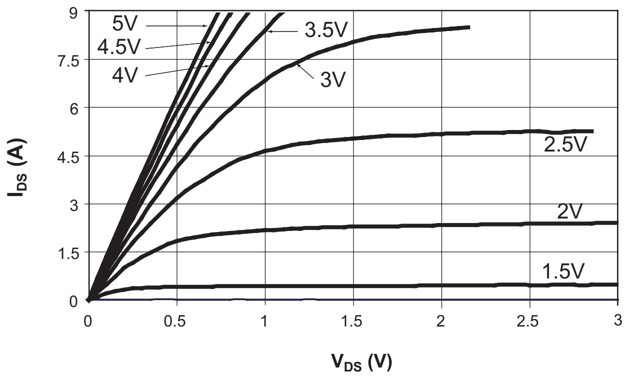
Note 2: Pulse test: Pulse Width = 300 μs

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

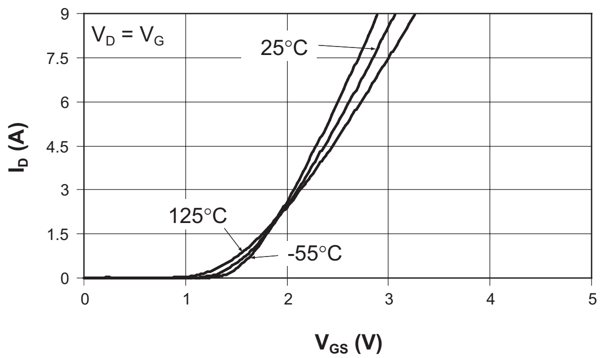
Typical Characteristics

(T_J = 25ºC unless otherwise noted)

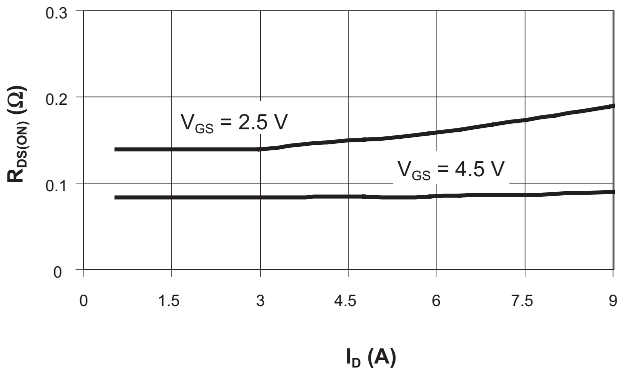
Output Characteristics



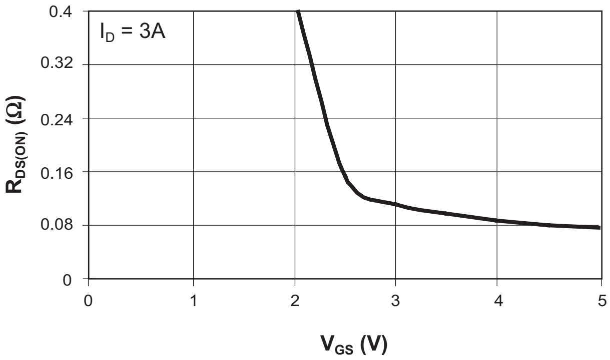
Transfer Characteristics



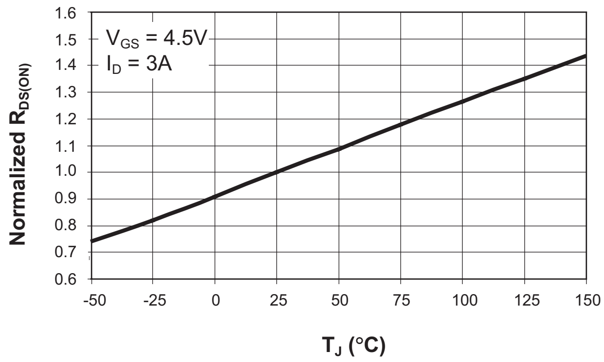
On-Resistance vs. Drain Current



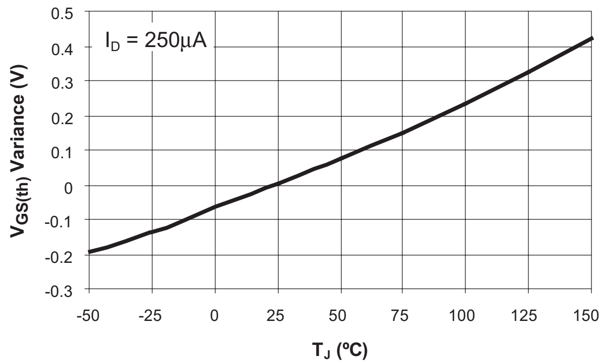
On-Resistance vs. Gate to Source Voltage



On-Resistance vs. Junction Temperature



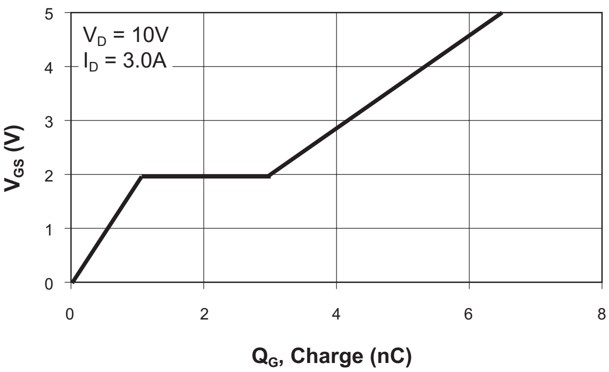
Threshold Voltage



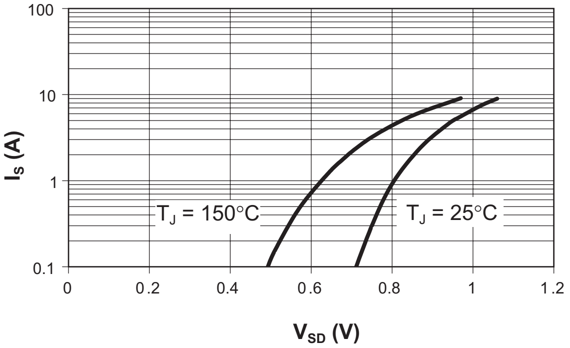
Typical Characteristics

(T_J = 25ºC unless otherwise noted)

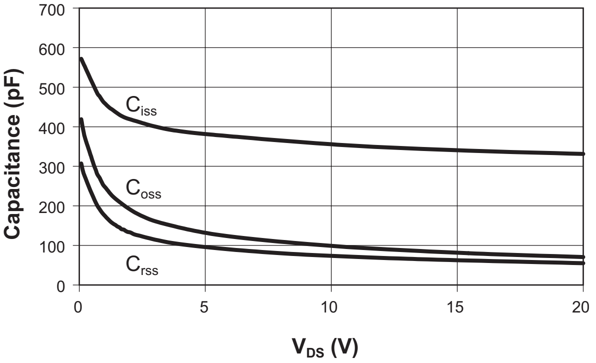
Gate Charge



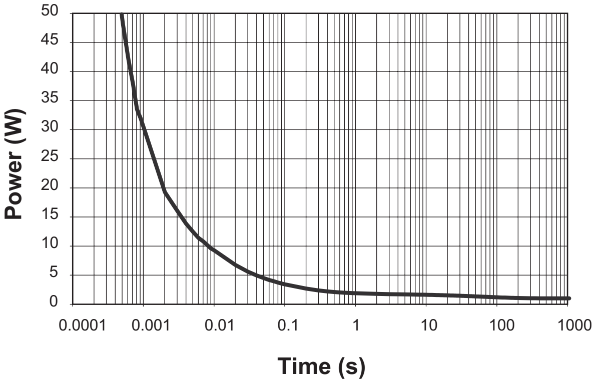
Source-Drain Diode Forward Voltage



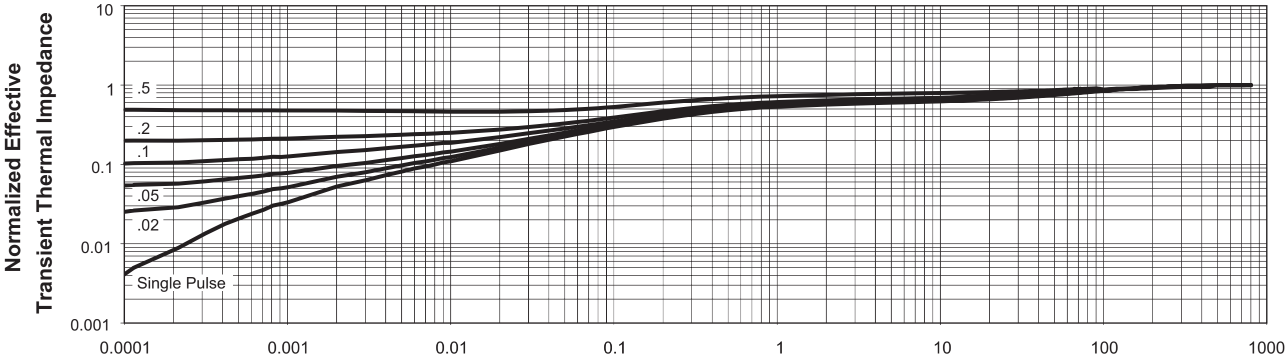
Capacitance



Single Pulse Power, Junction To Ambient



Transient Thermal Response, Junction to Ambient



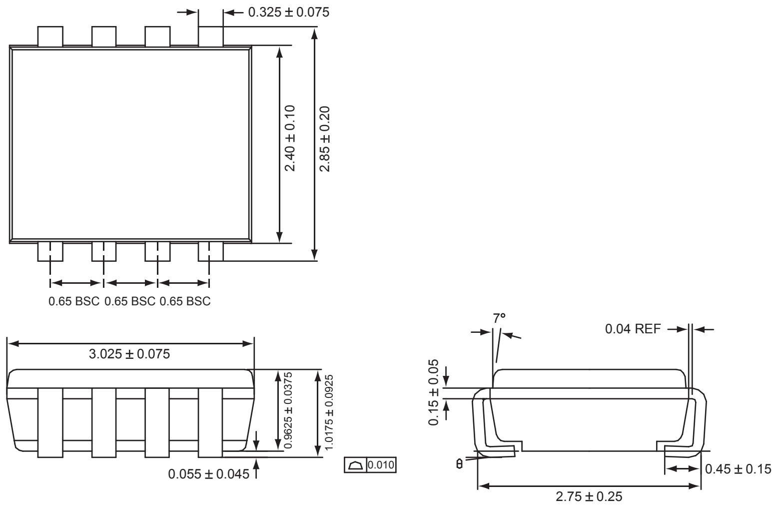
Ordering Information

Package	Marking[1]	Part Number (Tape and Reel)
TSOPJW-8	JYXYY	AAT7361ITS-T1

Note 1: XYY = assembly and date code.

Package Information

TSOPJW-8



All dimensions in millimeters.

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