DESCRIPTION

The AM2305 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

The AM2305 is available in SOT-23 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM2305E3R
		AM2305E3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

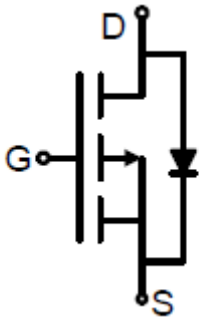
FEATURES

- V_{DS} = -20V,I_D = -4.1A
  $R_{DS(ON)}$ <75mΩ@ V_{GS}=-2.5V
  $R_{DS(ON)}$ < 52mΩ@ V_{GS}=-4.5V
- High Power and current handing capability
- Surface Mount Package
- Available in SOT-23 Package

APPLICATION

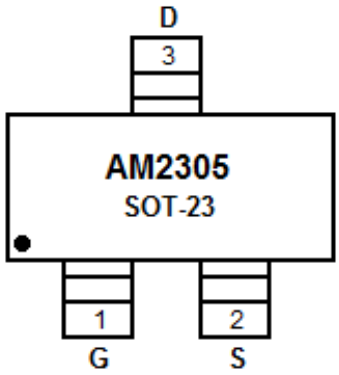
- PWM applications
- Load switch
- Power management

P CHANNEL MOSFET



Schematic diagram

PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	G	Gate
2	S	Source
3	D	Drain

ABSOLUTE MAXIMUM RATINGS

V_{DS}, Drain-Source Voltage	-20V
V_{GS}, Gate-Source Voltage	±8V
I_D, Drain Current-Continuous	-4.1A
I_{DM}, Drain Current-Pulsed[NOTE1]	-15A
P_D, Maximum Power Dissipation	1.7W
T_J, T_{STG}, Operating Junction and Storage Temperature Range	-55°C ~150°C

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: Repetitive Rating: Pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTICS

Parameter	Symbol	Limit	Units
Thermal Resistance,Junction-to-Ambient[NOTE2]	$R_{\theta JA}$	74	°C/W

NOTE2: Surface Mounted on FR4 Board, t ≤ 10 sec.

ELECTRICAL CHARACTERISTICS

T_A=25℃, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V,I_D=-250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V	-	-	±100	nA
On Characteristics NOTE 3						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.45	-0.7	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V,I_D=-4.1A	-	45	52	mΩ
		V_{GS}=-2.5V,I_D=-3.0A	-	60	75	
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-3.5A	-	8.5	-	S
Dynamic Characteristics NOTE 4						
Input Capacitance	C_{lss}	V_{DS}=-4V,V_{GS}=0V, F=1.0MHz	-	740	-	pF
Output Capacitance	C_{oss}		-	290	-	
Reverse Transfer Capacitance	C_{rss}		-	190	-	
Switching Characteristics NOTE 4						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-4V, I_D=-3.3A R_L=1.2Ω, V_{GEN}=-4.5V R_G=1Ω	-	12	-	ns
Turn-on Rise Time	t_r		-	35	-	
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	
Turn-Off Fall Time	t_f		-	10	-	
Total Gate Charge	Q_g	V_{DS}=-4V,I_D=-4.1A, V_{GS}=-4.5V	-	7.8	-	nC
Gate-Source Charge	Q_{gs}		-	1.2	-	
Gate-Drain Charge	Q_{gd}		-	1.6	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage NOTE3	V_{SD}	V_{GS}=0V, I_S=-1.6A	-	-	-1.2	V
Diode Forward Current NOTE2	I_S		-	-	1.6	A

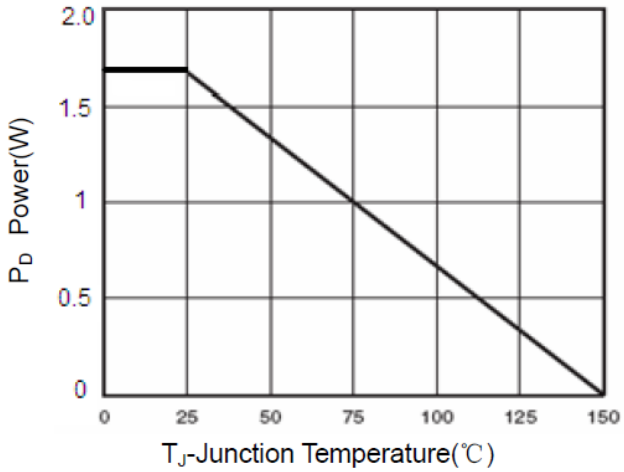
NOTE2: Surface Mounted on FR4 Board, t ≤ 10 sec.

NOTE3: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

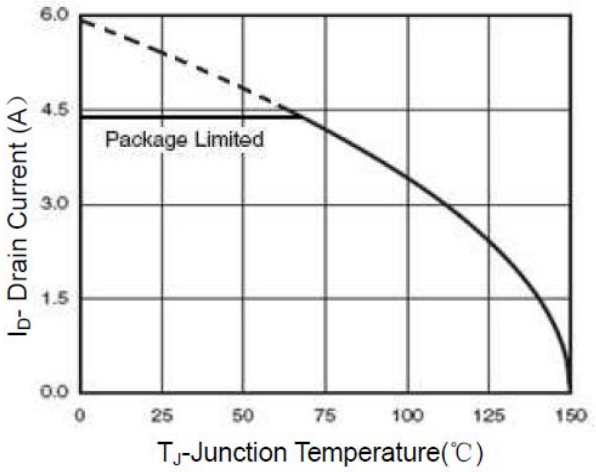
NOTE4: Guaranteed by design, not subject to production

TYPICAL PERFORMANCE CHARACTERISTICS

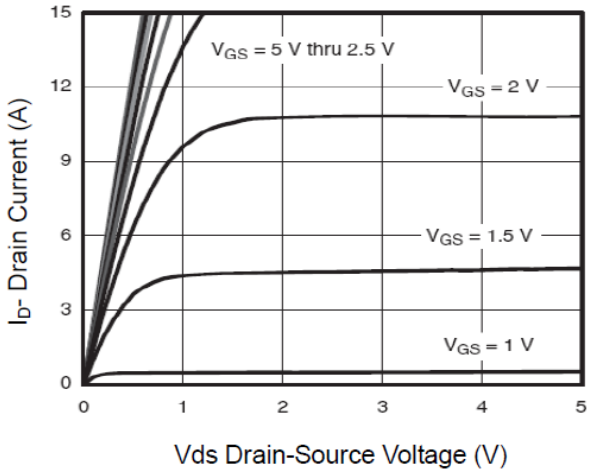
1. Power Dissipation



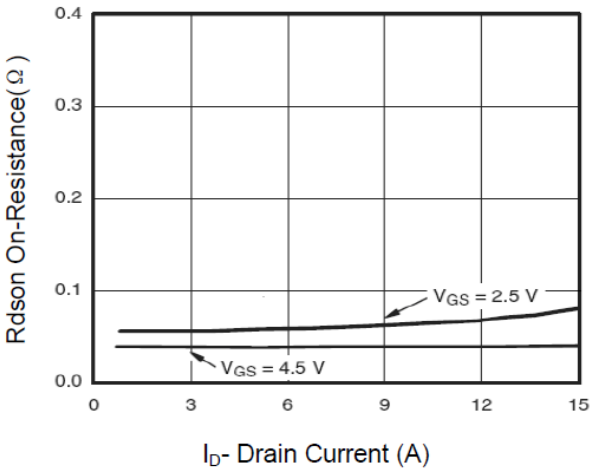
2. Drain Current



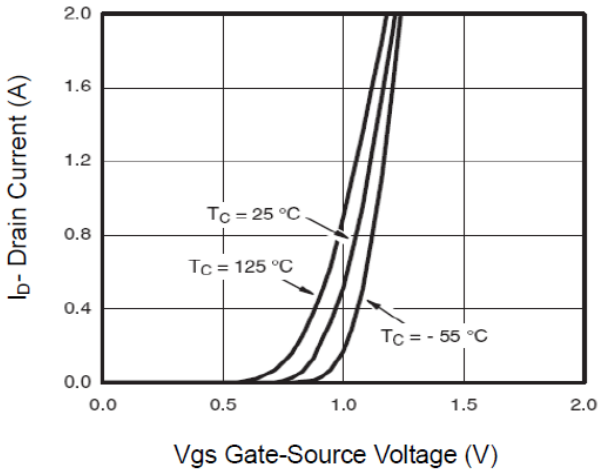
3. Output CHARACTERISTICS



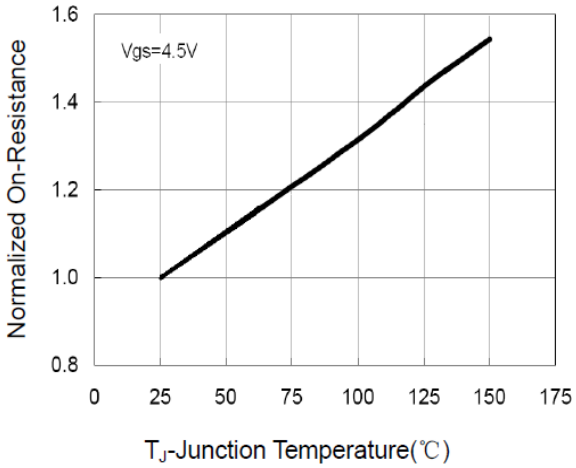
4. Drain-Source On-Resistance



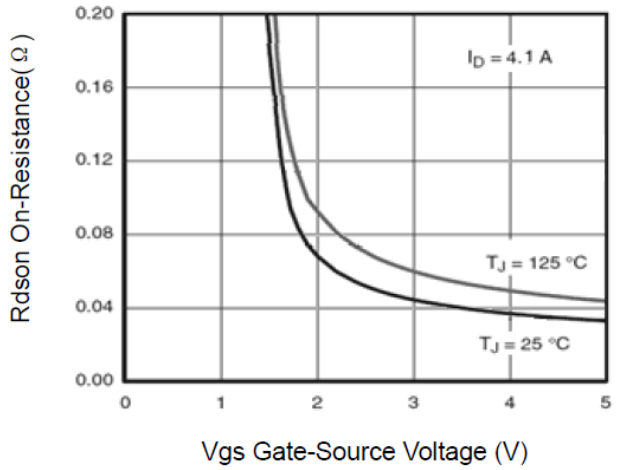
5. Transfer Characteristics



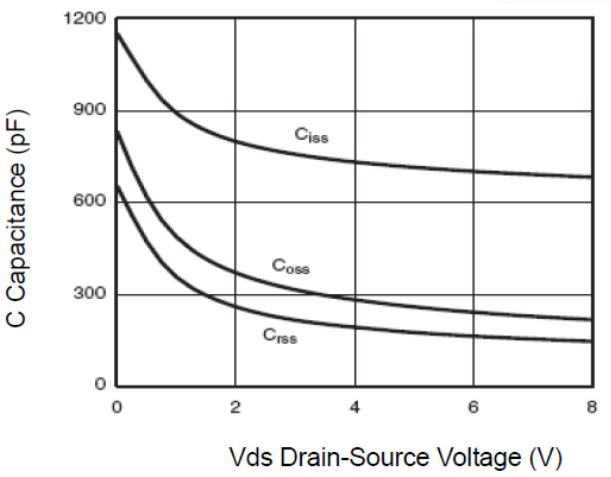
6. Drain-Source On-Resistance



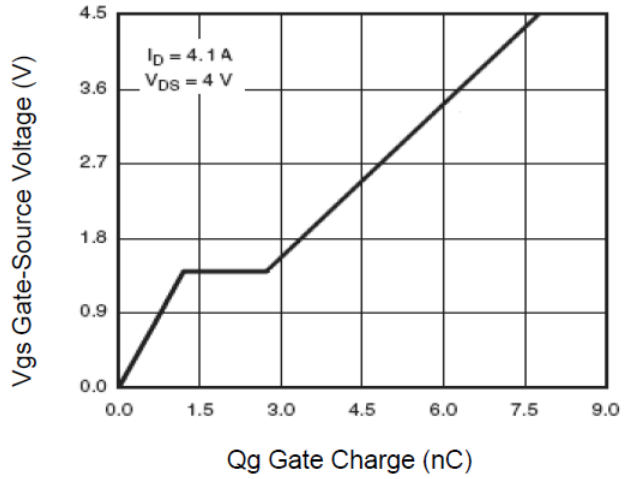
7. Rdson vs. Vgs



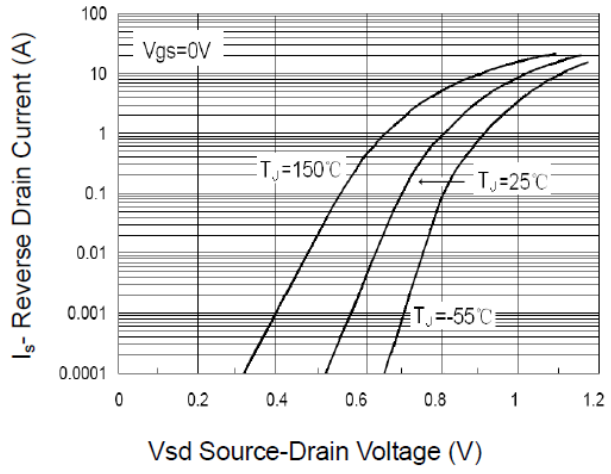
8. Capacitance vs. Vds



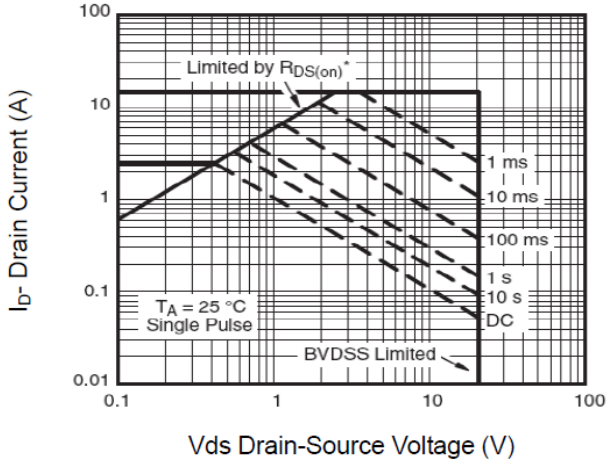
9. Gate Charge



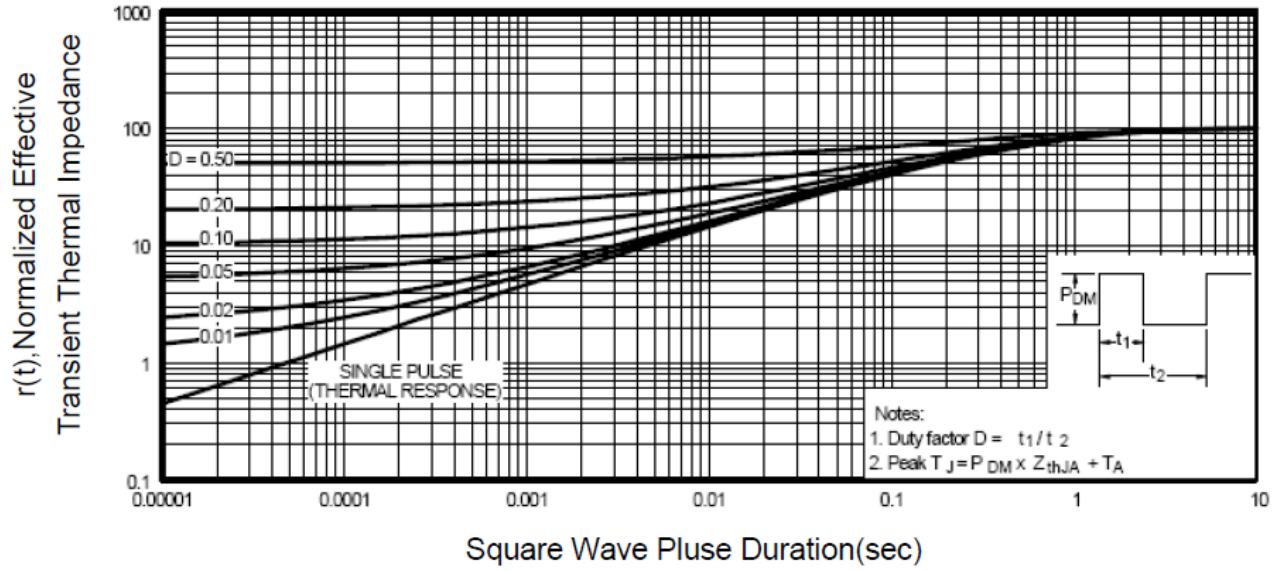
10. Source- Drain Diode Forward



11. Safe Operation Area

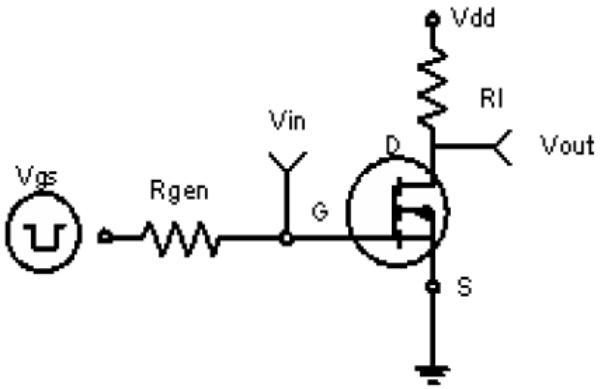


12. Normalized Maximum Transient Thermal Impedance

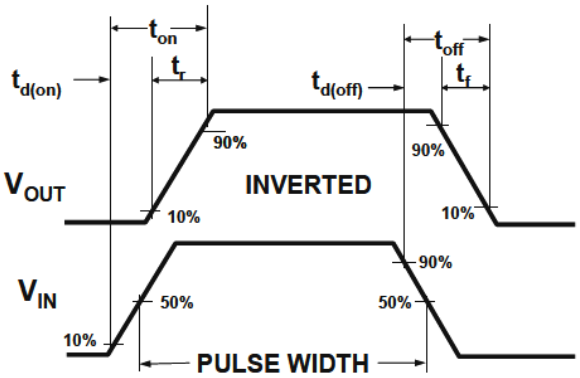


DETAILED INFORMATION

1. Switching Test Circuit

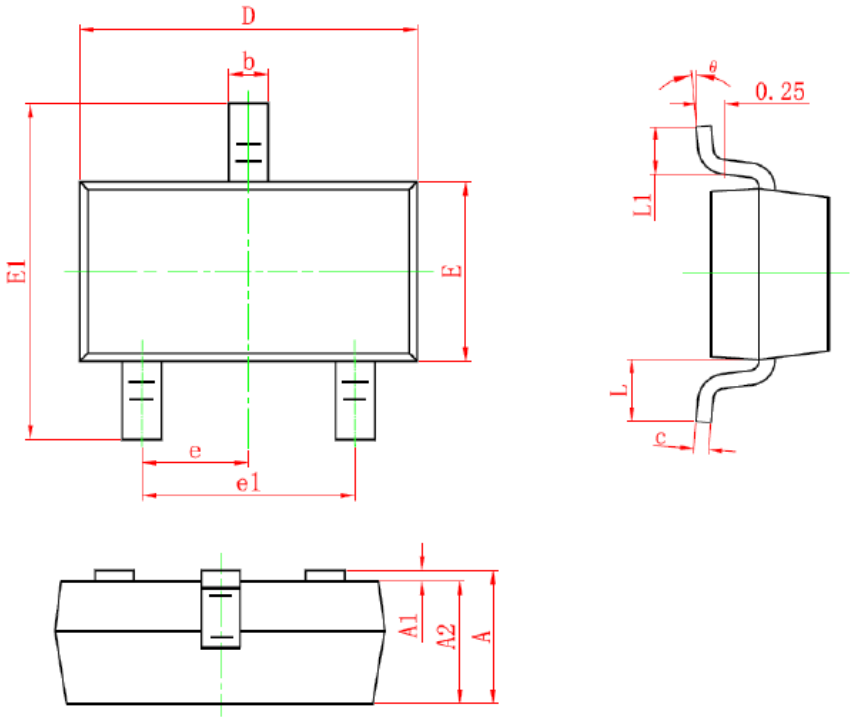


2. Switching Waveforms



PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



SYMBOL	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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