Features

- VDS = - 2 0 V , I D = - 5 . 4 A
  $R_{DS(ON)}$ < 6 0 m Ω @ V_{GS}=-2.5V
  $R_{DS(ON)}$ < 4 5 m Ω @ V_{GS}=-4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

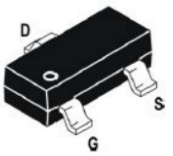
Product Summary

V_{DS}		-20	V
$R_{DS(on),typ}$	V_{GS}=-4.5V	45	mΩ
$R_{DS(on),typ}$	V_{GS}=-2.5V	60	mΩ
I_D		-5.4	A

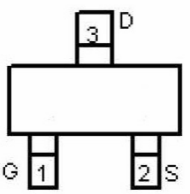
Application

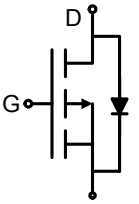
- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

top view



SOT-23





ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter			Limit	Unit
Drain-Source Voltage		V_{DS}	- 8	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 5.4	A
	T_C = 70 °C		- 4.3	
	T_A = 25 °C		- 4.1[a, b]	
	T_A = 70 °C		- 3.3[a, b]	
Pulsed Drain Current		I_{DM}	- 10	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 1.4	
	T_A = 25 °C		- 0.8[a, b]	
Maximum Power Dissipation	T_C = 25 °C	P_D	1.7	W
	T_C = 70 °C		1.1	
	T_A = 25 °C		0.96[a, b]	
	T_A = 70 °C		0.62[a, b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 50 to 150	°C
Soldering Recommendations (Peak Temperature)			260	

Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. t = 10 s.

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a, b]	t ≤ 10 s	R_{thJA}	100	130	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	60	75	

Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. Maximum under Steady State conditions is 175 °C/W.

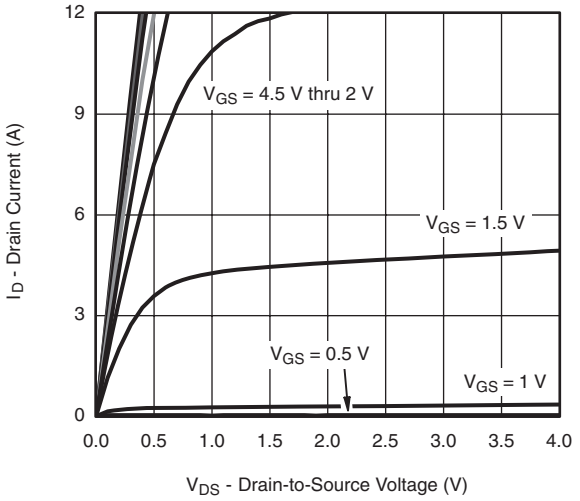
SPECIFICATIONS T_J = 25 °C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 20			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 55		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			2.1		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.45		- 0.8	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 8 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 8 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ - 5 V, V_{GS} = - 4.5 V	- 5			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 4.1 A		0.032	0.040	Ω
		V_{GS} = - 2.5 V, I_D = - 3.4 A		0.048	0.060	
		V_{GS} = - 1.8 V, I_D = - 2.0 A		0.070	0.088	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 4.1 A		8		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 4 V, V_{GS} = 0 V, f = 1 MHz		740		pF
Output Capacitance	C_{oss}			290		
Reverse Transfer Capacitance	C_{rss}			190		
Total Gate Charge	Q_g	V_{DS} = - 4 V, V_{GS} = - 4.5 V, I_D = - 4.1 A		7.8	15	nC
		V_{DS} = - 4 V, V_{GS} = - 2.5 V, I_D = - 4.1 A		4.5	9	
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			1.6		
Gate Resistance	R_g	f = 1 MHz	1.4	7	14	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 4 V, R_L = 1.2 Ω I_D ≅ - 3.3 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		13	20	ns
Rise Time	t_r			35	53	
Turn-Off DelayTime	$t_{d(off)}$			32	48	
Fall Time	t_f			10	20	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 4 V, R_L = 1.2 Ω I_D ≅ - 3.3 A, V_{GEN} = - 8 V, R_g = 1 Ω		5	10	
Rise Time	t_r			11	17	
Turn-Off DelayTime	$t_{d(off)}$			22	33	
Fall Time	t_f			16	24	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 1.4	A
Pulse Diode Forward Current[a]	I_{SM}				- 10	
Body Diode Voltage	V_{SD}	I_F = - 3.3 A		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 3.3 A, dI/dt = 100 A/µs, T_J = 25 °C		33	50	ns
Body Diode Reverse Recovery Charge	Q_{rr}			14	21	nC
Reverse Recovery Fall Time	t_a			14		ns
Reverse Recovery Rise Time	t_b			19		

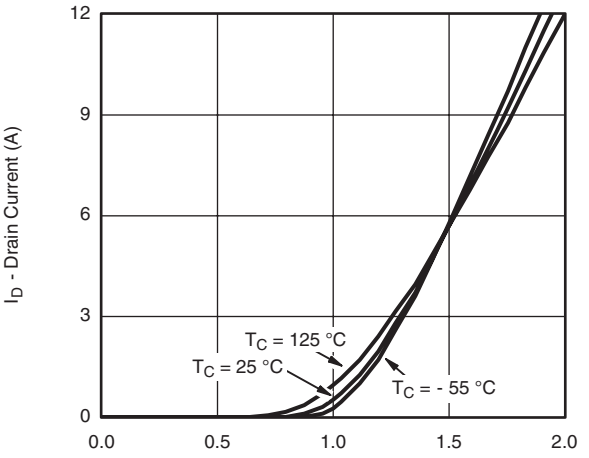
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

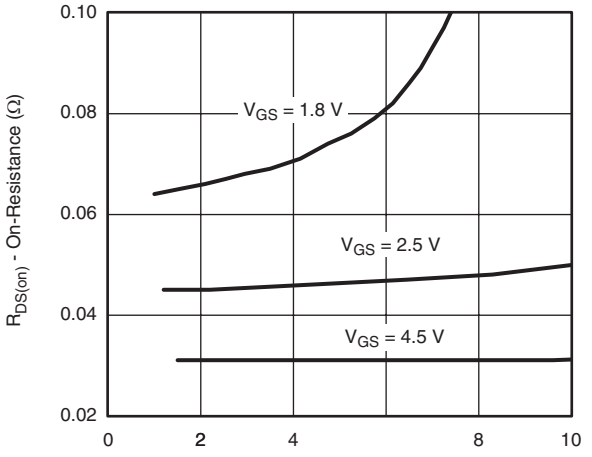
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



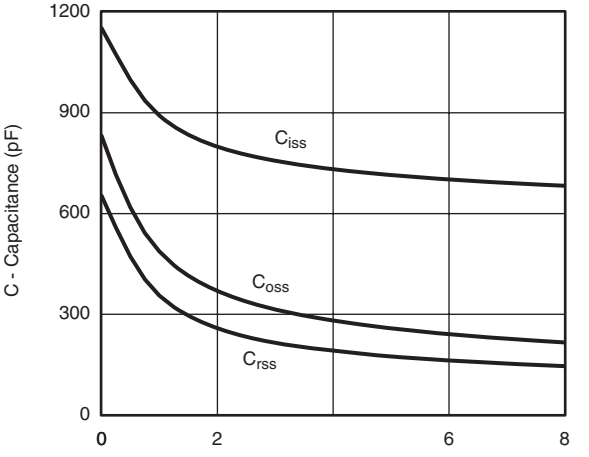
Output Characteristics



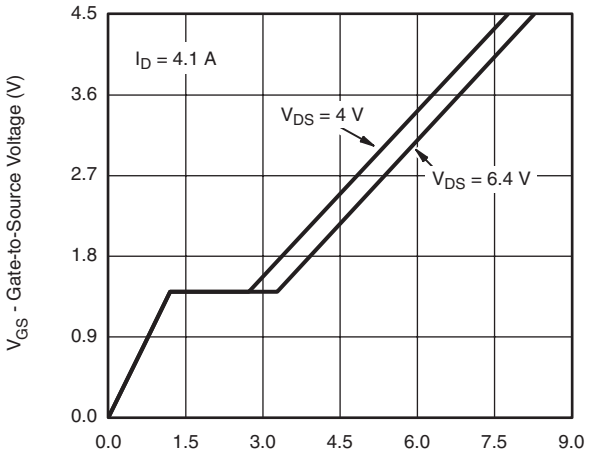
Transfer Characteristics



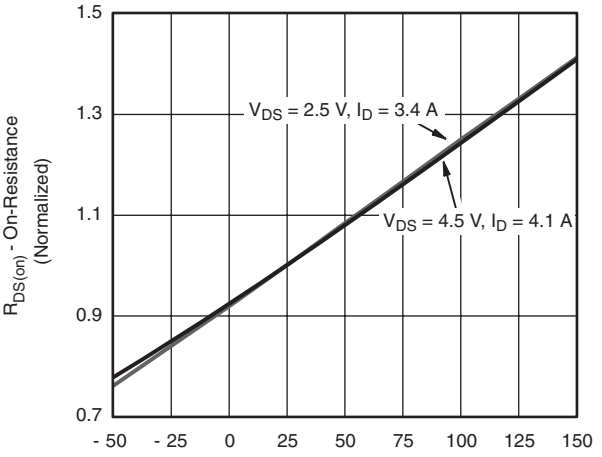
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

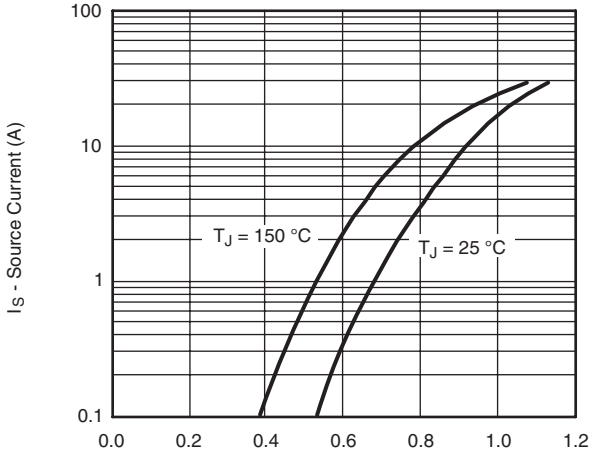


Gate Charge

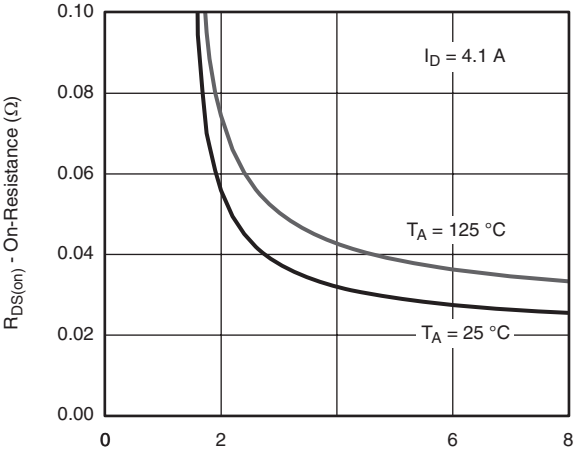


On-Resistance vs. Junction Temperature

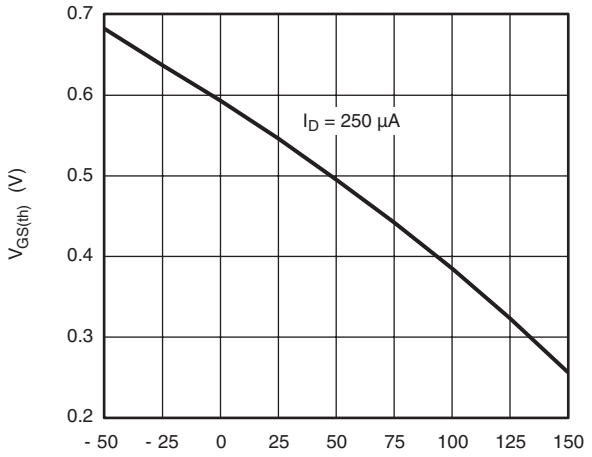
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



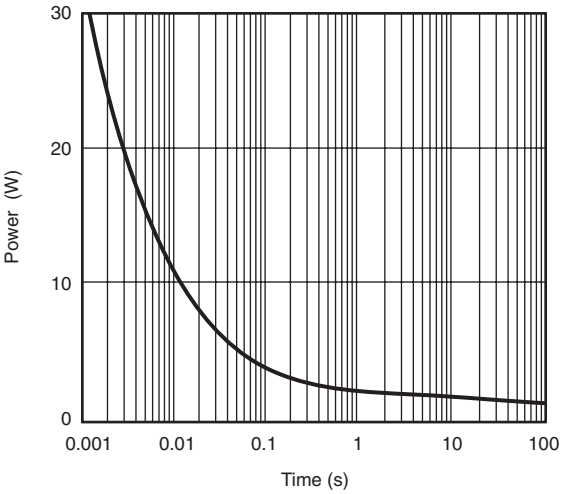
Source-Drain Diode Forward Voltage



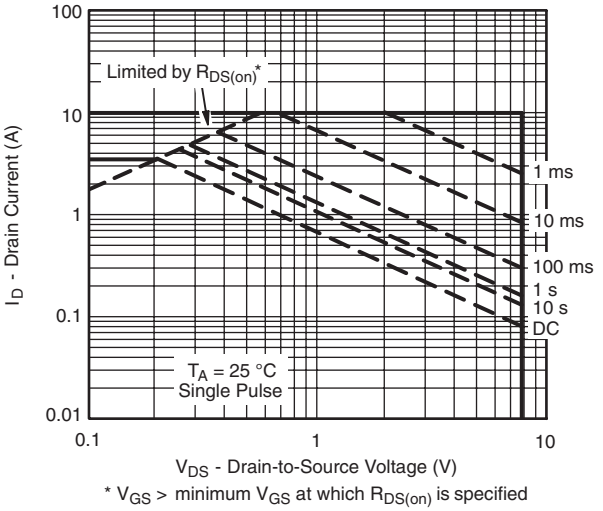
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



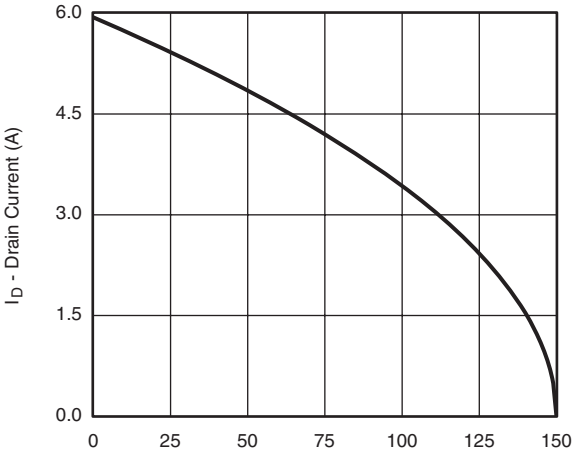
Single Pulse Power, Junction-to-Ambient



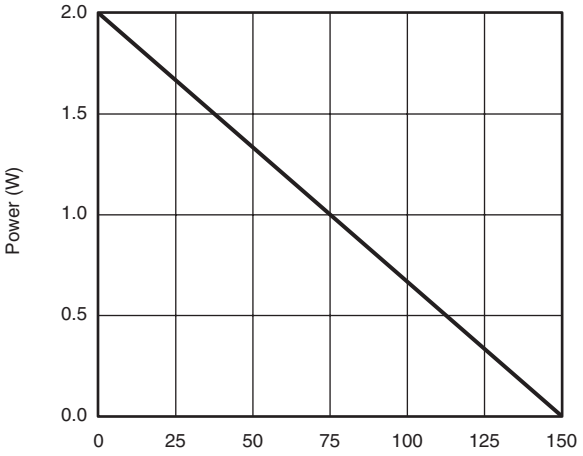
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

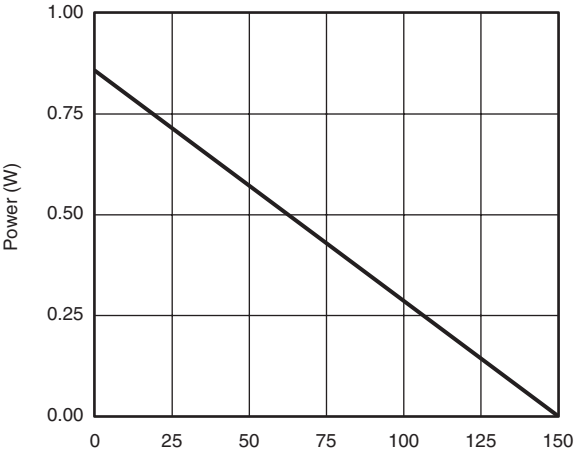
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating*



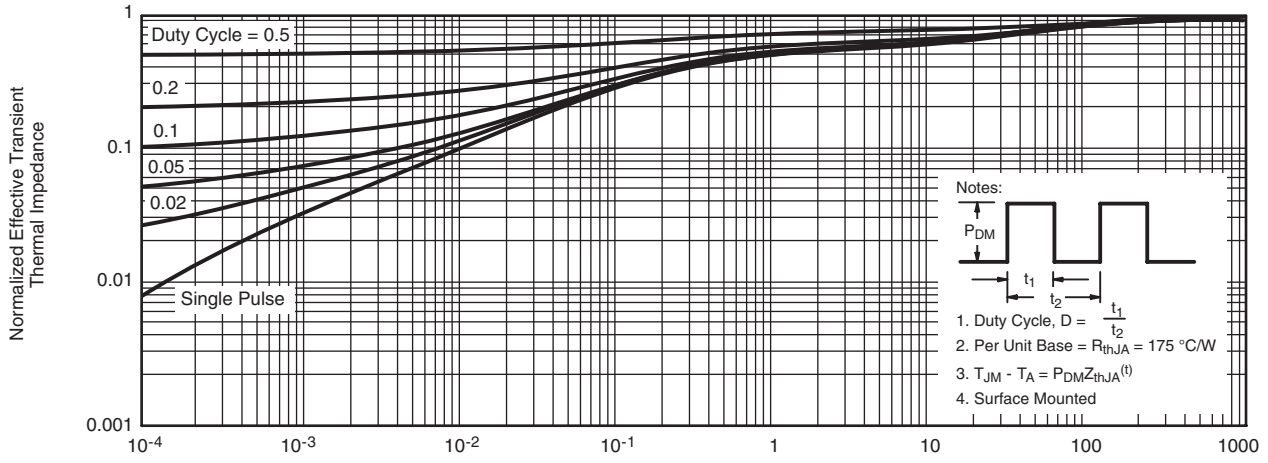
Power, Junction-to-Case



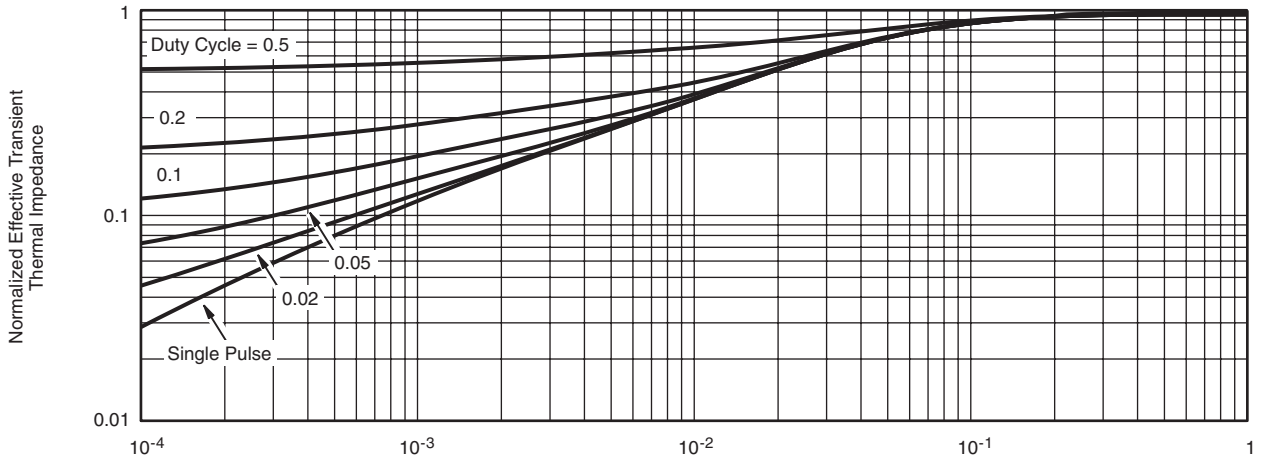
Power, Junction-to-Ambient

* The po er dissipation P_D is based on $T_{J(max)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
ASDM2305ZA	2305	SOT23	Tape&Reel	3000/Reel	-	-

PACKAGE	MARKING
SOT23	**2305**

Ordering Number		Package
Lead Free	Halogen Free	
ASDM2305-ZA-R	ASDM2305G-ZA-R	SOT23

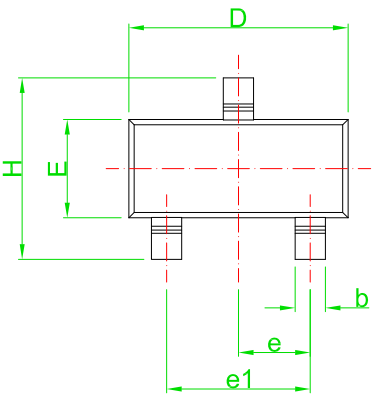
ASDM2305G-ZA-R

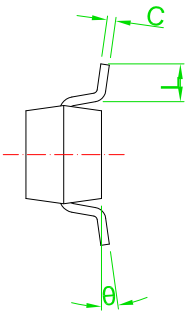
- 1 Packing Type
- 2 Package Type
- 3Green Package

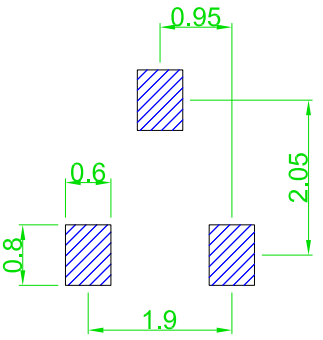
1 T:Tube,R:Tape Reel

2 ZA: SOT23

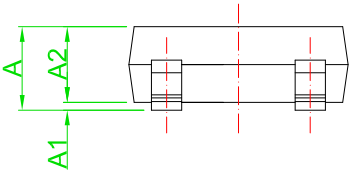
3 blank : Lead Free
G:Halogen Free and Lead Free



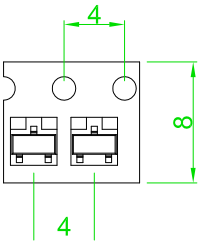




Recommended Land Pattern



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.55	0.012	0.022
C	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
e	0.95 TYP		0.037 TYP	
e1	1.80	2.00	0.071	0.079
H	2.25	2.55	0.089	0.100
L	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°



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