

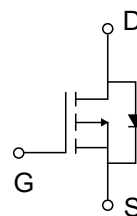
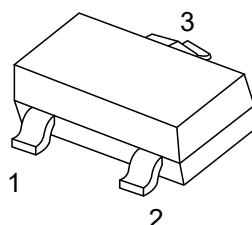
1.Features

- $V_{DS(V)} = -12V$
- $Q_g = 9nC$
- $R_{DS(ON)} < 35m\Omega (V_{GS} = -4.5V, I_D = -5.1A)$
- $R_{DS(ON)} < 45m\Omega (V_{GS} = -2.5V, I_D = -4.5A)$
- $R_{DS(ON)} < 59m\Omega (V_{GS} = -1.8V, I_D = -3.9A)$

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	S	SOURCE
3	D	DRAIN

SOT-23



4.Absolute Maximum Ratings $T_A = 25^\circ C$

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-12	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current ($T_J = 150^\circ C$)	$T_C = 25^\circ C$	I_D	-7.1	A
	$T_C = 70^\circ C$		-5.7	
	$T_A = 25^\circ C$		-5.1 ^{bc}	
	$T_A = 70^\circ C$		-4 ^{bc}	
Pulsed Drain Current		I_{DM}	-20	
Continuous Source-Drain Diode Current	$T_C = 25^\circ C$	I_S	-1	
	$T_A = 25^\circ C$		-0.63 ^{bc}	



Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	P_D	2.5	W
	$T_C=70^{\circ}\text{C}$		1.6	
	$T_A=25^{\circ}\text{C}$		$1.25^{b,c}$	
	$T_A=70^{\circ}\text{C}$		$0.8^{b,c}$	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

5. Thermal resistance rating

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^{b,d}	$t \leq 5\text{s}$	R_{thJA}	75	100	$^{\circ}\text{C/W}$
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	40	50	$^{\circ}\text{C/W}$

Notes:

- a. Based on $T_C=25^{\circ}\text{C}$.
- b. Surface Mounted on 1" x 1" FR4 board.
- c. $t=5\text{s}$.
- d. Maximum under Steady State conditions is 166°C/W .



6. $T_J=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS}=0\text{V}$, $I_D=-250\mu\text{A}$	-12			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D=-250\mu\text{A}$		-13		mV/ $^{\circ}\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			2.6		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-0.4		-1	V
Gate-Source Leakage	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 8\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-12\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$V_{DS}=-12\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^{\circ}\text{C}$			-10	
On-State Drain Current ^a	$I_{D(ON)}$	$V_{DS}\leq -5\text{V}$, $V_{GS}=-4.5\text{V}$	-20			A
Drain-Source On-State Resistance ^a	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}$, $I_D=-5.1\text{A}$		28.5	35	m Ω
		$V_{GS}=-2.5\text{V}$, $I_D=-4.5\text{A}$		36	45	
		$V_{DS}=-1.8\text{V}$, $I_D=-2\text{A}$		46	59	
Forward Transconductance ^a	g_{FS}	$V_{DS}=-5\text{V}$, $I_D=-5.3\text{A}$		18.5		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS}=-6\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		1225		pF
Output Capacitance	C_{oss}			315		
Reverse Transfer Capacitance	C_{rss}			260		
Total Gate Charge	Q_g	$V_{DS}=-6\text{V}$, $V_{GS}=-4.5\text{V}$, $I_D=-5.1\text{A}$		15	25	nC
		$V_{DS}=-6\text{V}$, $V_{GS}=-2.5\text{V}$ $I_D=-5.1\text{A}$		9	15	
Gate Source Charge	Q_{gs}			1.9		
Gate Drain Charge	Q_{gd}			3.8		
Gate Resistance	R_g	$f=1\text{MHz}$		4		Ω
Turn-On DelayTime	$t_{D(on)}$	$V_{DD}=-6\text{V}$, $R_L=6\Omega$ $I_D=-1\text{A}$, $V_{GEN}=-4.5\text{V}$ $R_g=1\Omega$		13	20	ns
Rise Time	t_r			35	60	
Turn-Off DelayTime	$t_{D(off)}$			45	70	
Fall Time	t_f			12	20	



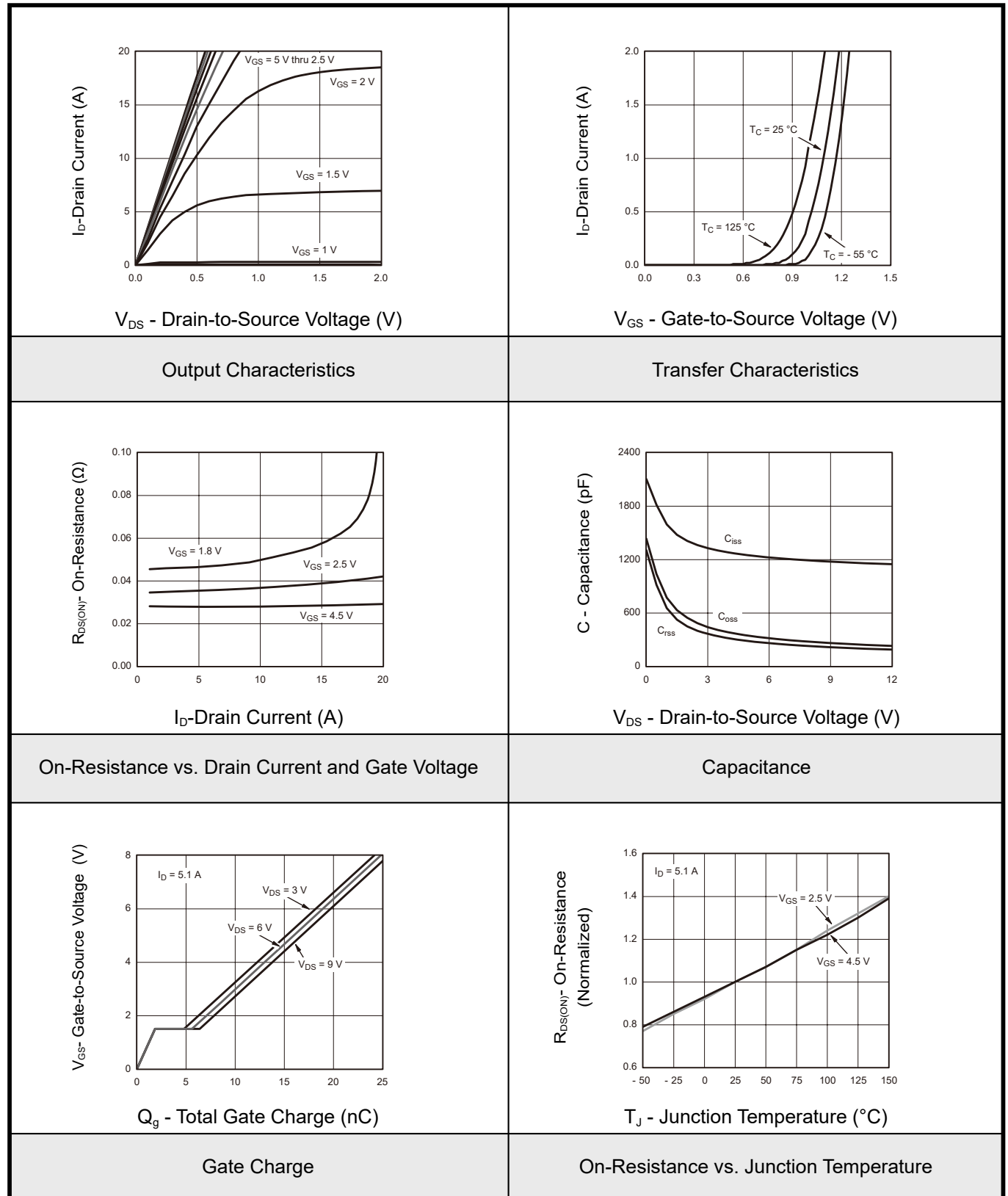
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C=25^{\circ}\text{C}$			-1	A
Pulse Diode Forward Current ^a	I_{SM}				-20	A
Body Diode Voltage	V_{SD}	$I_S=-1\text{A}$		-0.7	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-1\text{A}, dI/dt=100\text{A}/\mu\text{s}$ $T_J=25^{\circ}\text{C}$		32	50	ns
Body Diode Reverse Recovery Charge	Q_{rr}			20	40	nC
Reverse Recovery Fall Time	t_a			16		ns
Reverse Recovery Rise Time	t_b			16		ns

Notes:

- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\ \%$.
- b. Guaranteed by design, not subject to production testing.

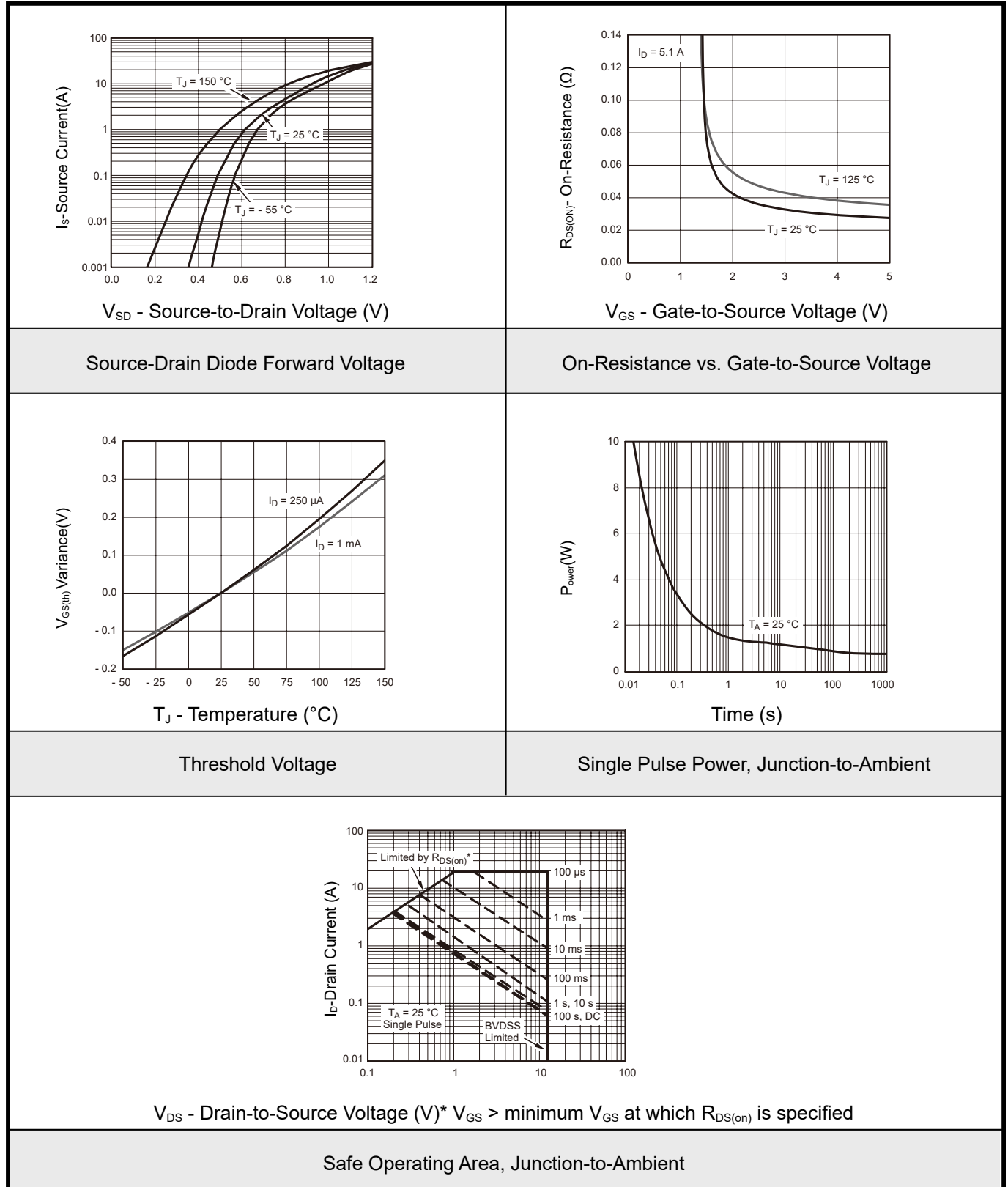


7.1 Typical Characteristics



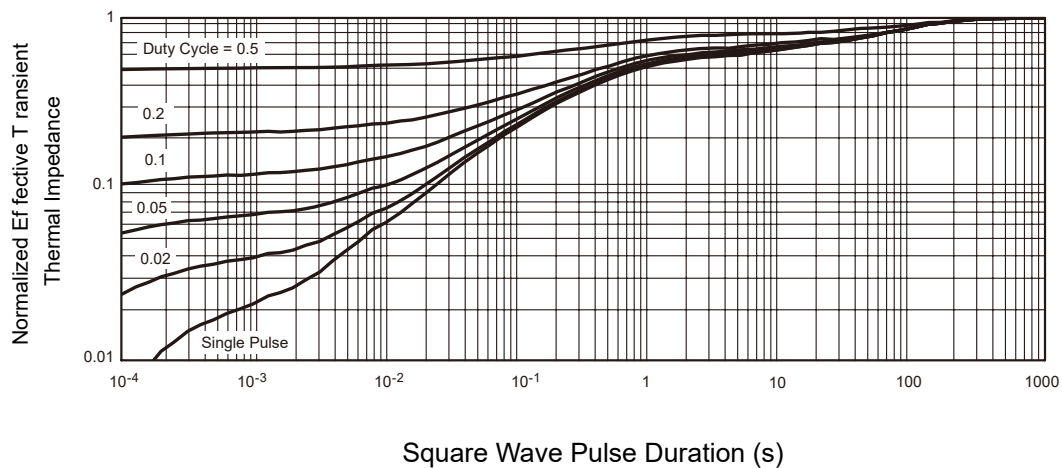


7.2 Typical Characteristics

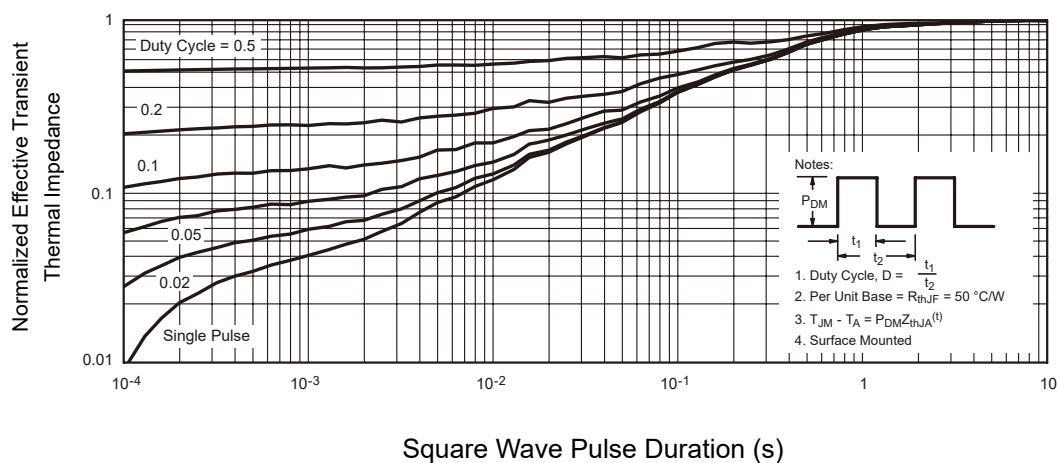




7.3 Typical Characteristics



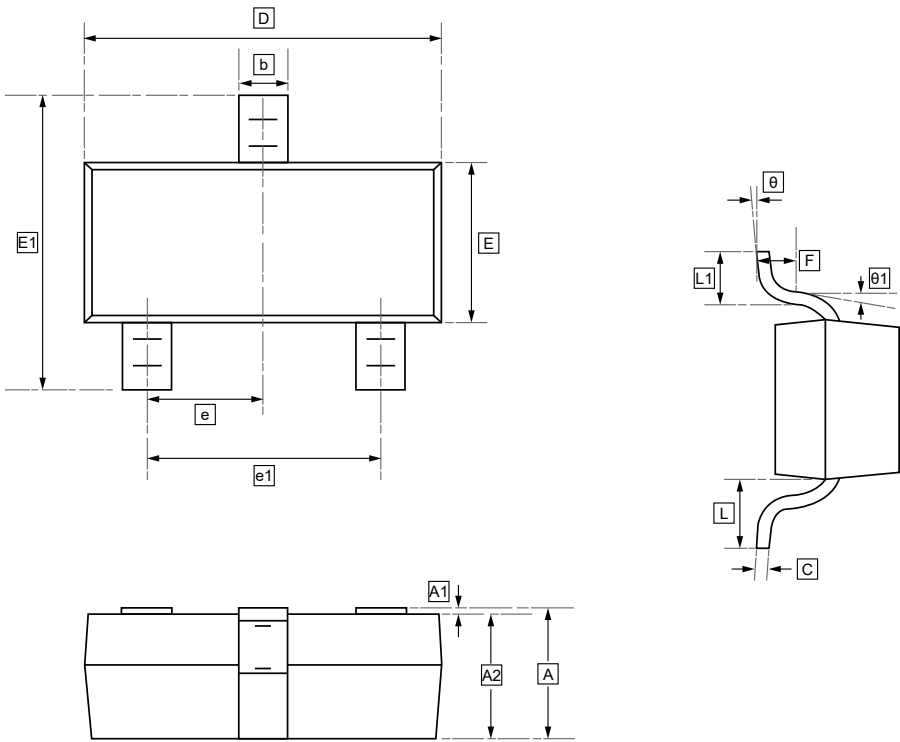
Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot



8.SOT-23 Package Outline Dimensions



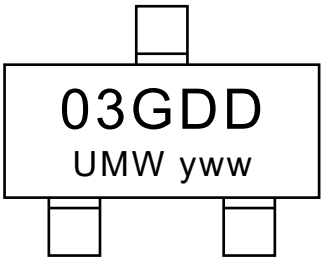
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°



9.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW SI2333CDS	SOT-23	3000	Tape and reel



10.Disclaimer

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