

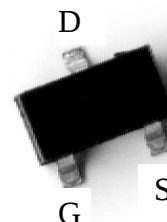
20V N-CHANNEL Enhancement Mode MOSFET

Features:

- Simple drive requirement
- Small package outline
- Capable of 2.5V gate drive
- Pb-free lead plating and halogen-free package

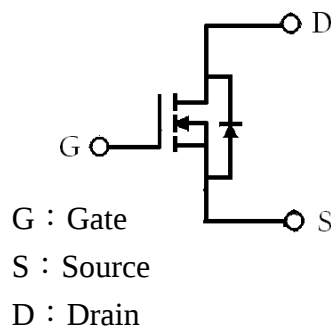
Outline

SOT-323



Symbol

KW2302S3



Ordering Information

Device	Package	Shipping
KW2302S3	SOT-323 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	
Continuous Drain Current @V _{GS} =4.5V, T _A =25°C (Note 3)	I _D	2.9	A
Continuous Drain Current @V _{GS} =4.5V, T _A =70°C (Note 3)		2.3	
Continuous Drain Current @V _{GS} =4.5V, T _A =25°C (Note 4)		2.3	
Continuous Drain Current @V _{GS} =4.5V, T _A =70°C (Note 4)		1.8	
Pulsed Drain Current (Notes 1, 2)	I _{DM}	30	
Maximum Power Dissipation@ T _A =25°C	P _D	0.7 (Note 3)	W
		0.43 (Note 4)	
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max (Note 3)	R _{θJA}	178	°C/W
Thermal Resistance, Junction-to-Ambient, max (Note 4)		290	
Thermal Resistance, Junction-to-Case, max	R _{θJC}	90	

- Note : 1. Pulse width limited by maximum junction temperature.
 2. Pulse width ≤ 300μs, duty cycle ≤ 2%.
 3. Surface mounted on 1 in² copper pad of FR-4 board, 2 oz. copper.
 4. Surface mounted on minimum copper pad, 2 oz. copper.

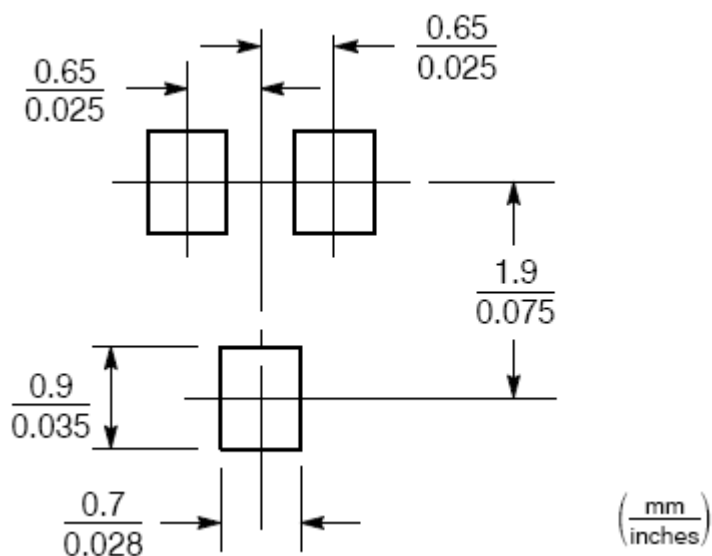
Electrical Characteristics (T_j=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	20	-	-	V	V _{GS} =0V, I _D =250μA
ΔBV _{DSS} /ΔT _j	-	0.02	-	V/°C	Reference to 25°C, I _D =250μA
V _{GS(th)}	0.5	-	1.2	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±12V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =20V, V _{GS} =0V
	-	-	10		V _{DS} =20V, V _{GS} =0V (T _j =70°C)
*R _{DS(ON)}	-	55	66	mΩ	I _D =2A, V _{GS} =4.5V
	-	65	85		I _D =2A, V _{GS} =2.5V
*G _{FS}	-	4	-	S	V _{DS} =5V, I _D =2A
Dynamic					
C _{iss}	-	440	-	pF	V _{DS} =10V, V _{GS} =0V, f=1MHz
C _{oss}	-	61	-		
C _{rss}	-	59	-		

t _d (ON)	-	4.5	-	ns	V _{DS} =10V, I _D =2A, V _{GS} =5V R _G =6Ω, R _D =2.8Ω
t _r	-	7.4	-		
t _d (OFF)	-	19	-		
t _f	-	7.2	-		
Q _g	-	4.4	-	nC	V _{DS} =10V, I _D =2A, V _{GS} =4.5V
Q _{gs}	-	0.7	-		
Q _{gd}	-	1.7	-		
Source-Drain Diode					
*V _{SD}	-	0.8	1.2	V	V _{GS} =0V, I _S =1.6A
I _S	-	-	1	A	V _D =V _G =0V, V _S =1.2V
I _{SM}	-	-	10		

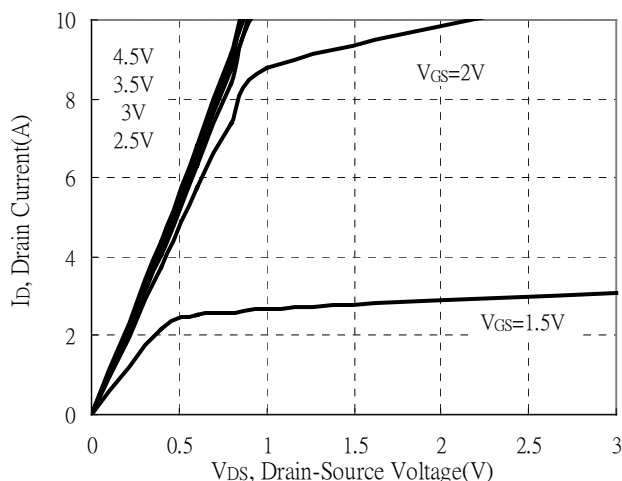
*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Recommended Soldering Footprint

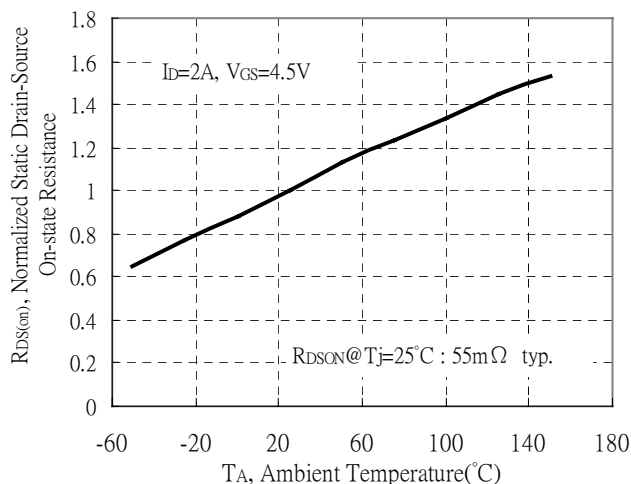


Typical Characteristics

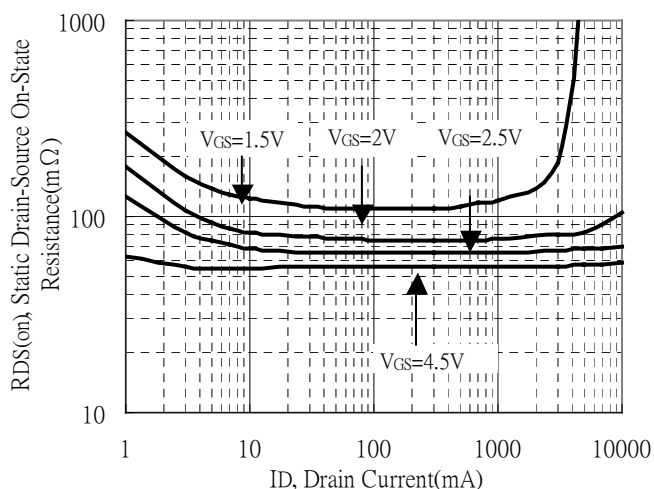
Typical Output Characteristics



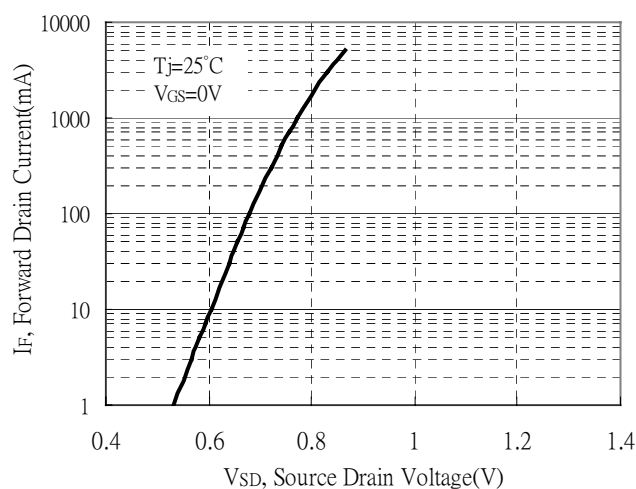
Static Drain-Source On-resistance vs Ambient Temperature



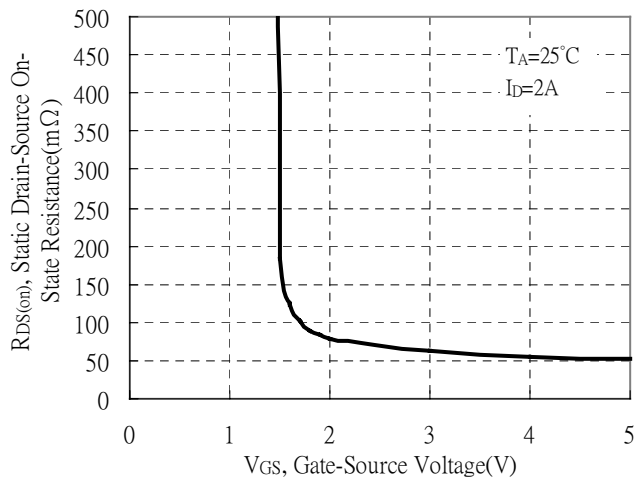
Static Drain-Source On-State resistance vs Drain Current



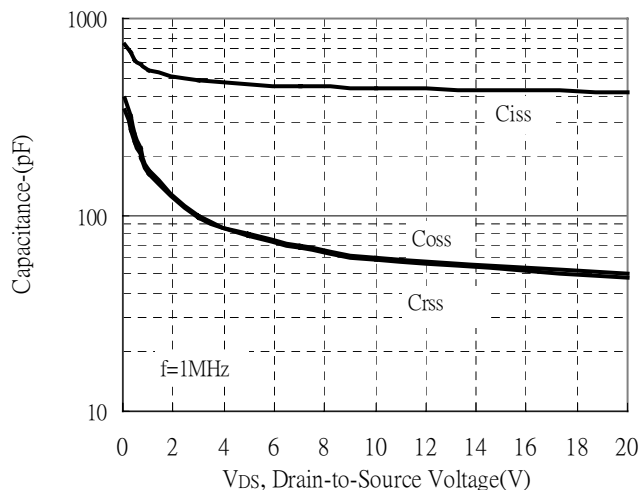
Forward Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

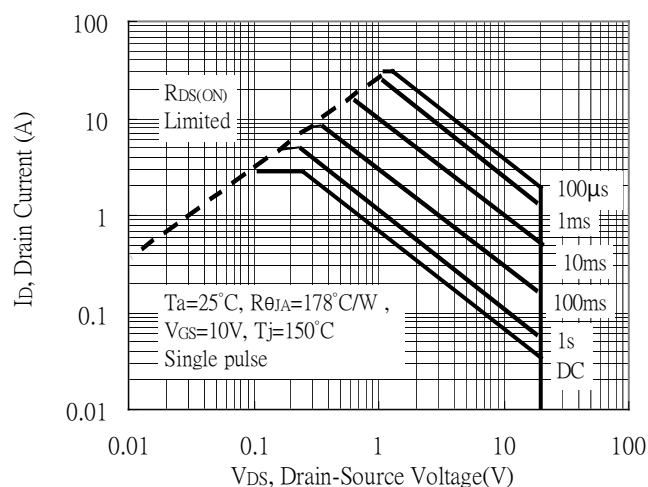


Capacitance vs Reverse Voltage

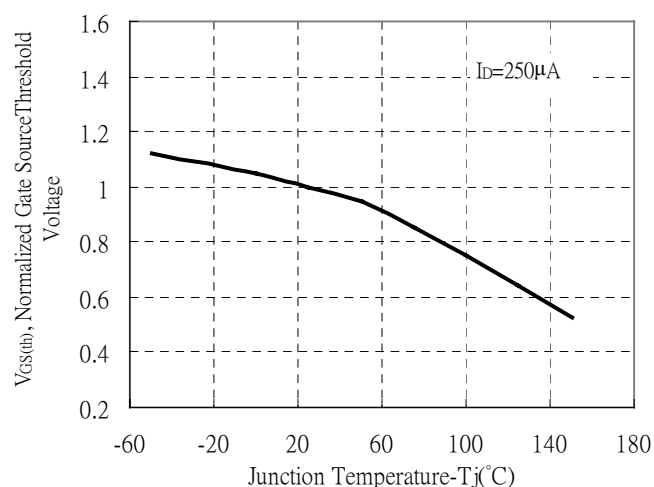


Typical Characteristics(Cont.)

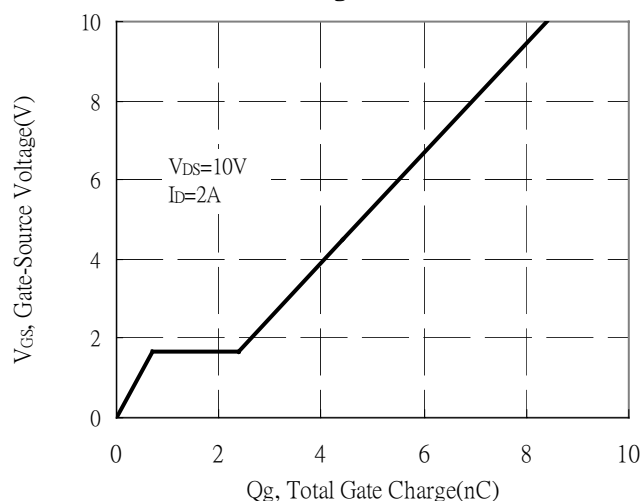
Maximum Safe Operating Area



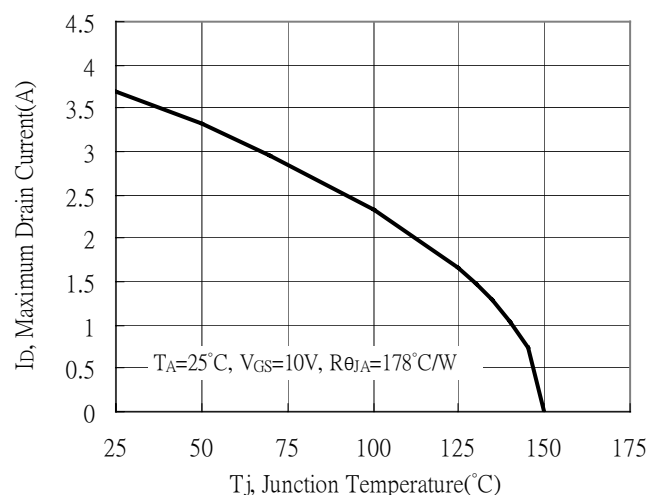
Gate Threshold Voltage vs Ambient Temperature



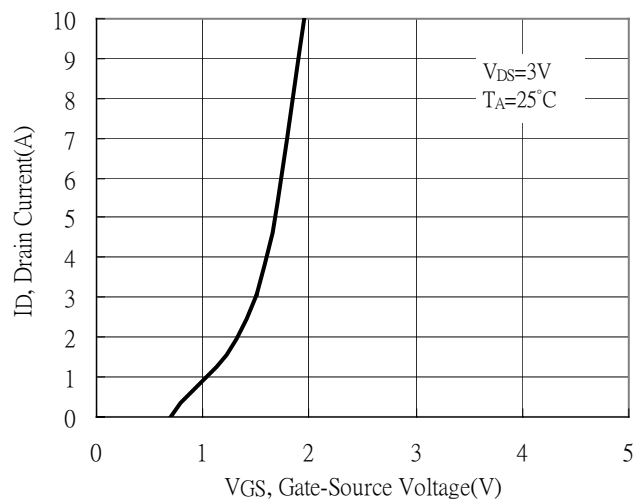
Gate Charge Characteristics



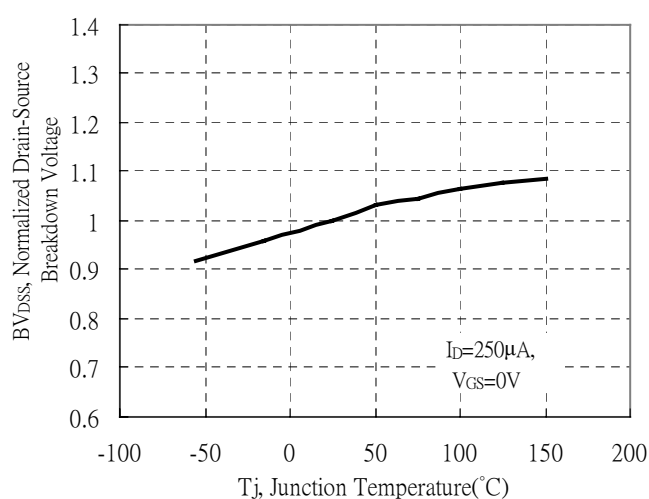
Maximum Drain Current vs Junction Temperature



Drain Current vs Gate-Source Voltage

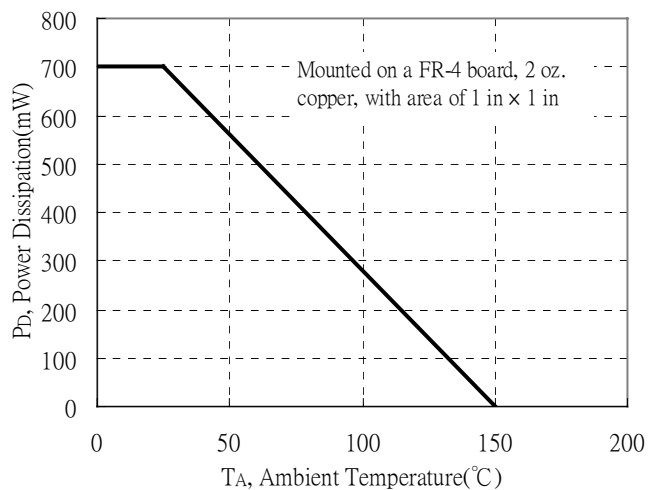


Breakdown Voltage vs Ambient Temperature

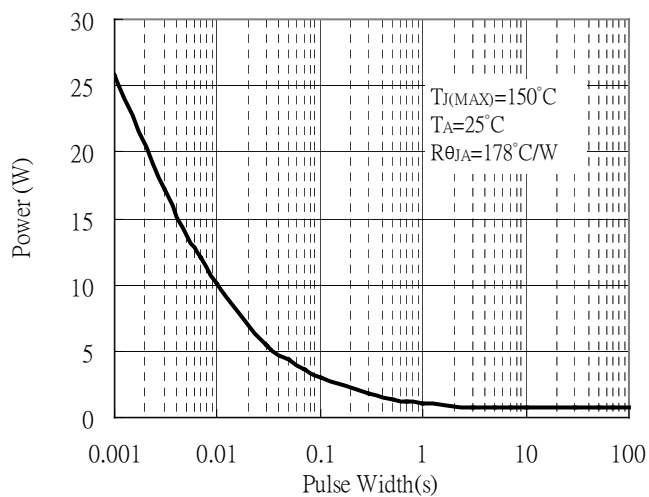


Typical Characteristics(Cont.)

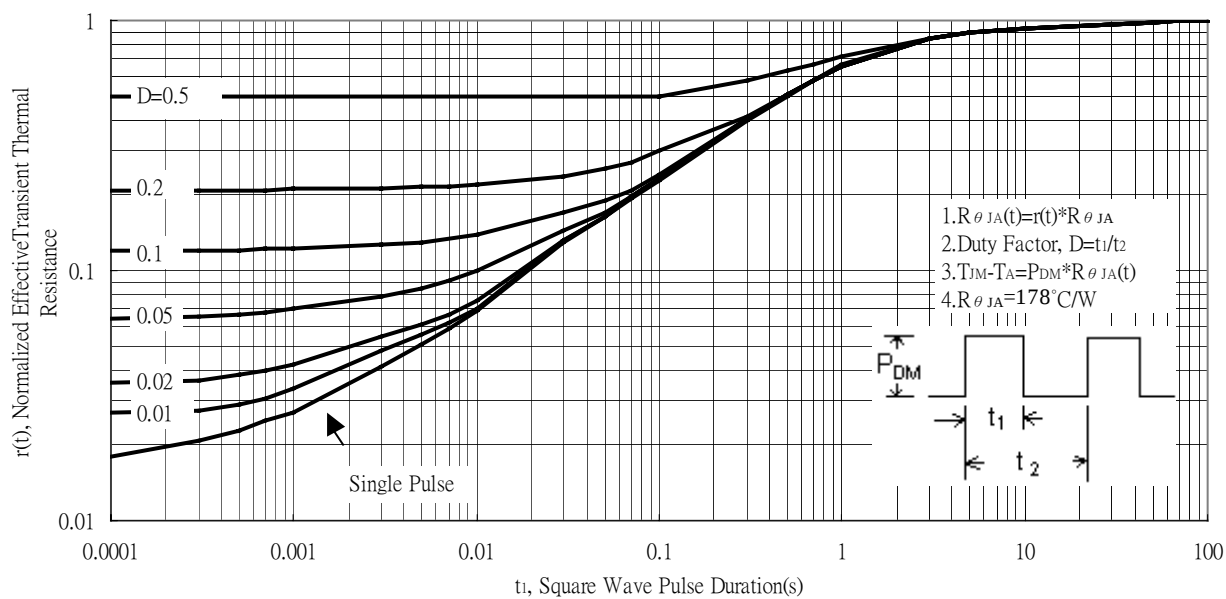
Power Derating Curve



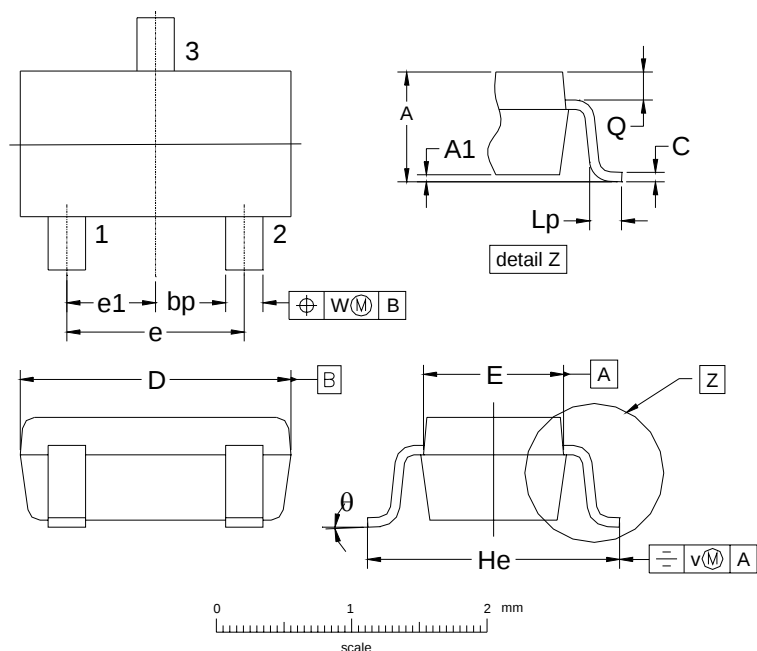
Single Pulse Power Rating, Junction to Ambient



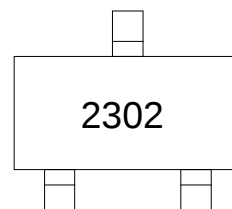
Transient Thermal Response Curves



SOT-323 Dimension



Marking:



3-Lead SOT-323 Plastic
 Surface Mounted Package
 Code: S3

Style: Pin 1.Gate 2.Source 3.Drain

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0315	0.0433	0.80	1.10	e1	0.0256	-	0.65	-
A1	0.0000	0.0039	0.00	0.10	He	0.0787	0.0886	2.00	2.25
bp	0.0118	0.0157	0.30	0.40	Lp	0.0059	0.0177	0.15	0.45
C	0.0039	0.0098	0.10	0.25	Q	0.0051	0.0091	0.13	0.23
D	0.0709	0.0866	1.80	2.20	v	0.0079	-	0.2	-
E	0.0453	0.0531	1.15	1.35	w	0.0079	-	0.2	-
e	0.0512	-	1.3	-	θ	-	-	10°	0°