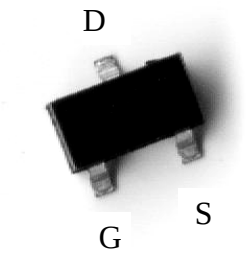
P-Channel Enhancement Mode MOSFET

Outline

SOT-23

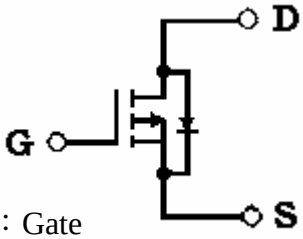


Features:

- Advanced trench process technology
- Super high density cell design for extremely low on resistance
- Reliable and rugged
- Compact and low profile SOT-23 package
- Pb-free lead plating and halogen-free package

Equivalent Circuit

K2305N3



G：Gate
S：Source
D：Drain

BV_{DSS}	**-20V**
I_D	**-4.3A**
R_{DSON}@V_{GS}=-4.5V, I_D=-4.2A	**52mΩ (typ.)**
R_{DSON}@V_{GS}=-2.5V, I_D=-2A	**66mΩ (typ.)**
R_{DSON}@V_{GS}=-1.8V, I_D=-1A	**79mΩ (typ.)**

Ordering Information

Device	Package	Shipping
K2305N3	SOT-23 (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	V
Continuous Drain Current @T_A=25°C, V_{GS}=-4.5V (Note 1)	I_D	-4.3	A
Continuous Drain Current @T_A=70°C, V_{GS}=-4.5V (Note 1)	I_D	-3.4	A
Pulsed Drain Current (Note 2)	I_{DM}	-20	A
Maximum Power Dissipation (Note 1)	P_D	1.38	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Note : 1. Surface mounted on 1 in²copper pad of FR-4 board, t ≤5s; 270°C/W when mounted on minimum copper pad.
2. Pulse width limited by maximum junction temperature.

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max (Note)	$R_{\theta JA}$	90	°C/W
Thermal Resistance, Junction-to-Case, max	$R_{\theta JC}$	75	°C/W

Note : Surface mounted on 1 in²copper pad of FR-4 board, t≤5s ; 270°C/W when mounted on minimum copper pad.

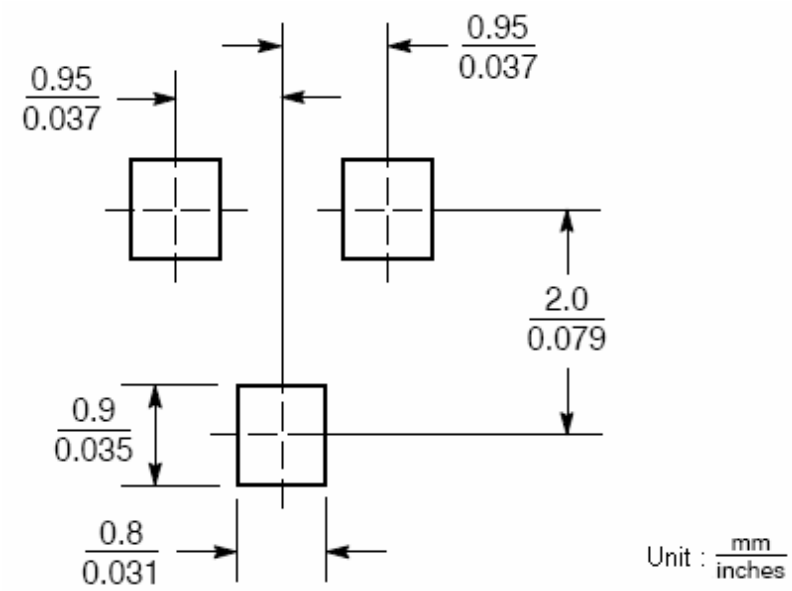
Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-20	-	-	V	V_{GS}=0, I_D=-250μA
$\Delta BV_{DSS}/\Delta Tj$	-	-0.02	-	V/°C	Reference to 25°C, I_D=-1mA
$V_{GS(th)}$	-0.5	-0.65	-	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±12V, V_{DS}=0
I_{DSS}	-	-	-1	μA	V_{DS}=-20V, V_{GS}=0
	-	-	-10		V_{DS}=-16V, V_{GS}=0, Tj=70°C
*$R_{DS(ON)}$	-	44	53	mΩ	I_D=-4.5A, V_{GS}=-10V
	-	52	65		I_D=-4.2A, V_{GS}=-4.5V
	-	66	85		I_D=-2.0A, V_{GS}=-2.5V
	-	79	120		I_D=-1.0A, V_{GS}=-1.8V
*G_{FS}	-	8.3	-	S	V_{DS}=-5V, I_D=-2.8A
Dynamic					
Ciss	-	1101	-	pF	V_{DS}=-15V, V_{GS}=0, f=1MHz
Coss	-	69	-		
Crss	-	60	-		
*$t_{d(ON)}$	-	7	-	ns	V_{DS}=-15V, I_D=-4.3A, V_{GS}=-10V, R_D=3.6Ω, R_G=6Ω
*t_r	-	5	-		
*$t_{d(OFF)}$	-	38	-		
*t_f	-	9	-		

*Qg	-	10.6	-	nC	V_{DS}=-16V, I_D=-4.3A, V_{GS}=-4.5V,
*Qgs	-	2	-		
*Qgd	-	2.8	-		
Source-Drain Diode					
*V_{SD}	-	-0.78	-1.2	V	V_{GS}=0V, I_{SD}=-1.2A
*trr	-	28	-	ns	I_S=-4.3A, V_{GS}=0V, dI/dt=100A/μs
*Qrr	-	22	-	nC	

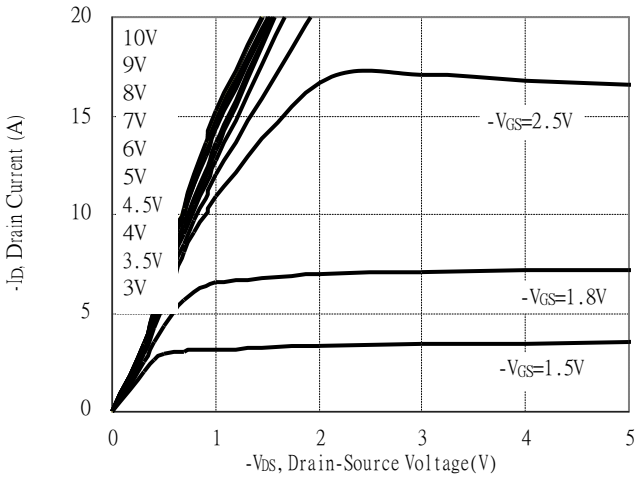
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

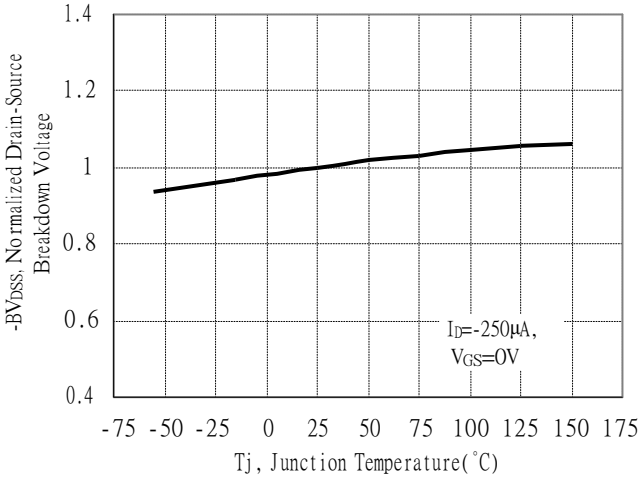


Typical Characteristics

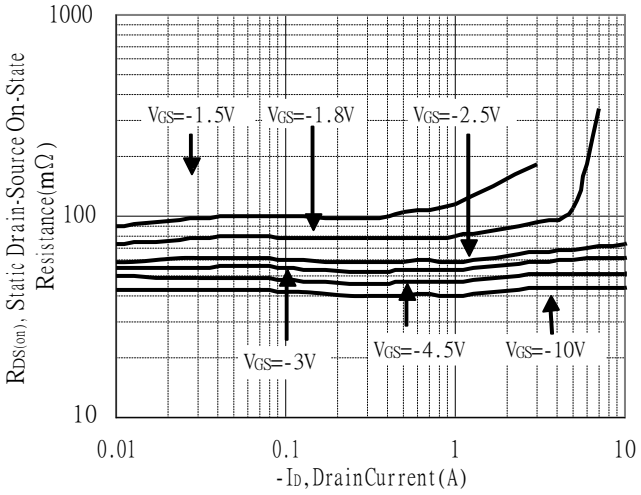
Typical Output Characteristics



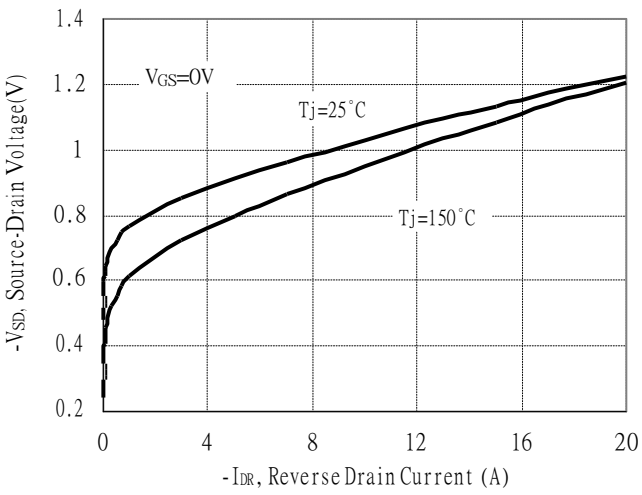
Brekdown Voltage vs Ambient Temperature



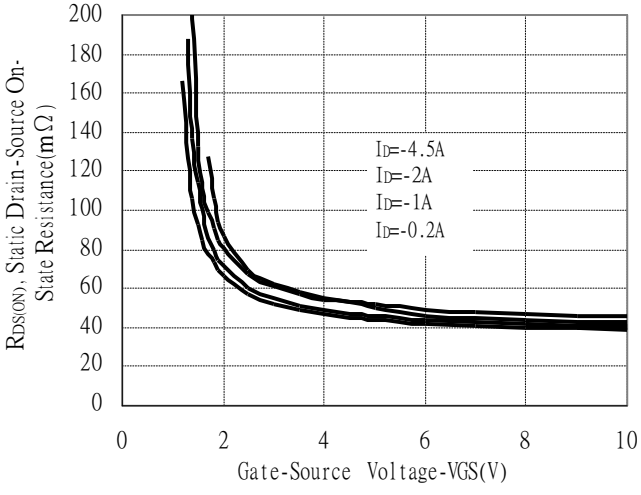
Static Drain-Source On-State resistance vs Drain Current



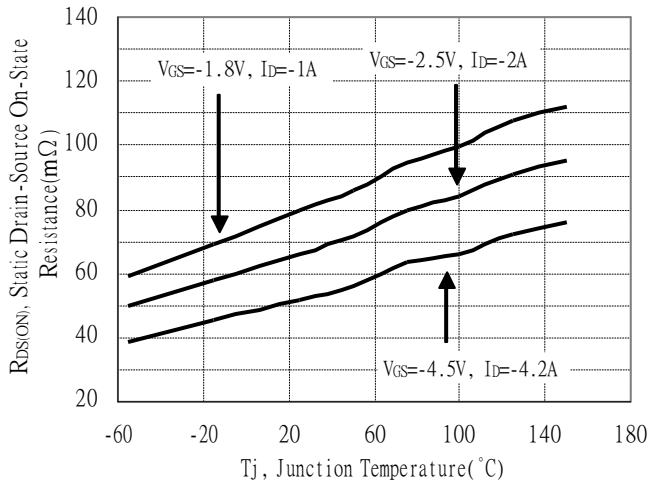
Reverse Drain Current vs Source-Drain Voltage



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

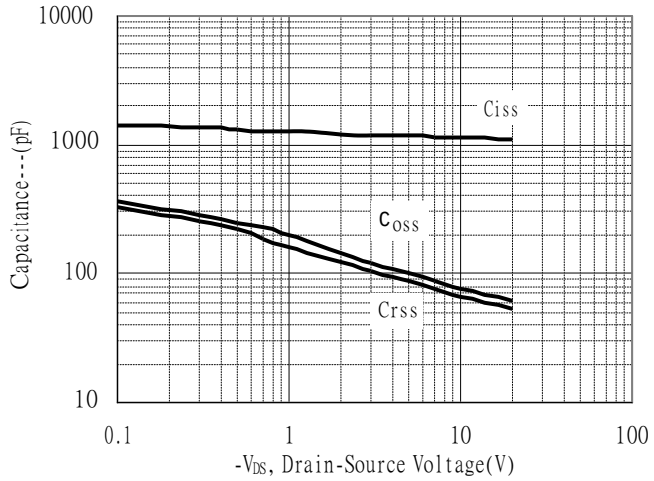


Drain-Source On-State Resistance vs Junction Tempearture

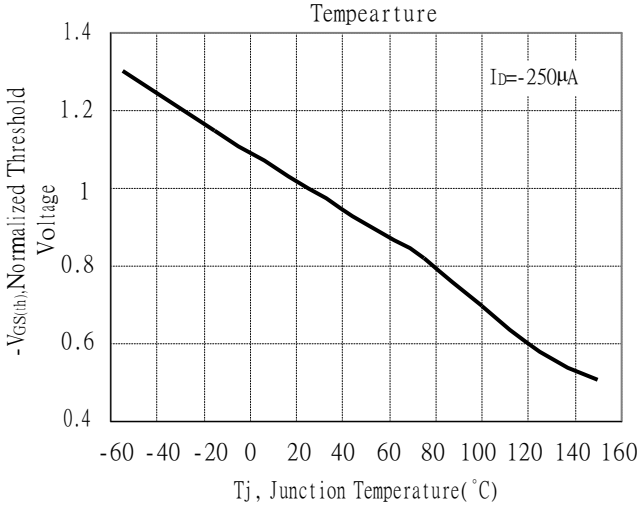


Typical Characteristics(Cont.)

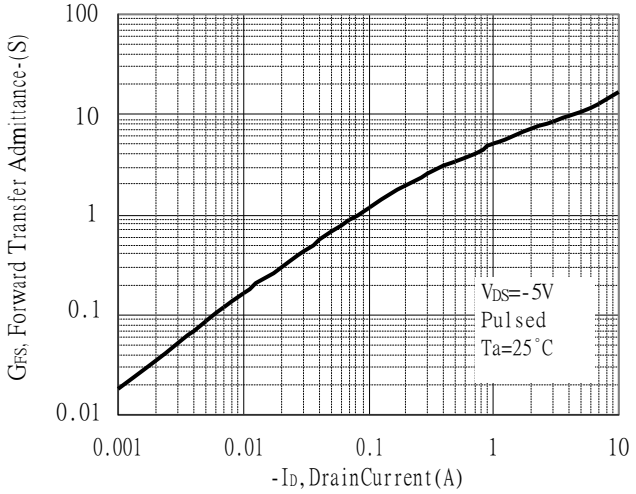
Capacitance vs Drain-to-Source Voltage



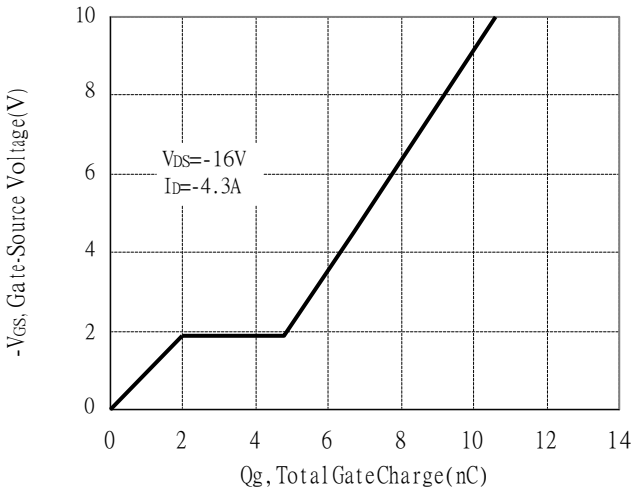
Normalized Threshold Voltage vs Junction Tempearture



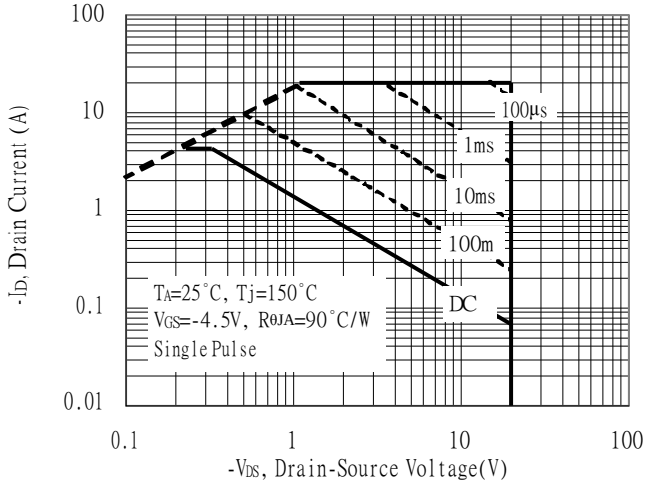
Forward Transfer Admittance vs Drain Current



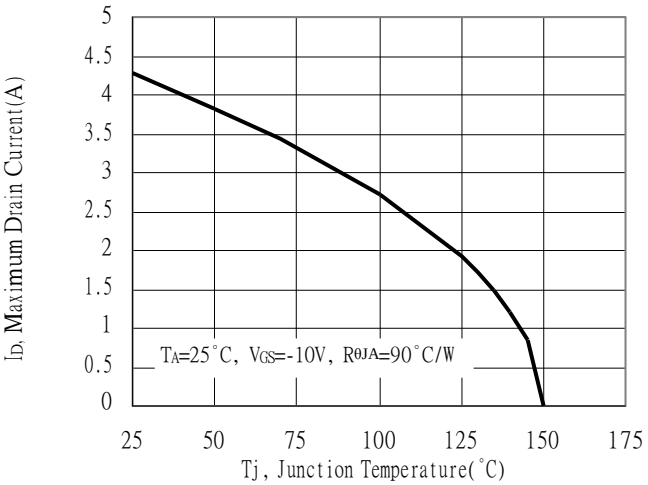
Gate Charge Characteristics



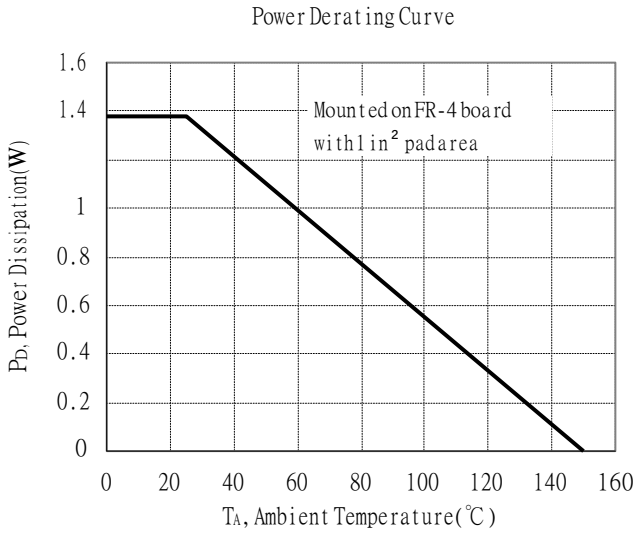
Maximum Safe Operating Area

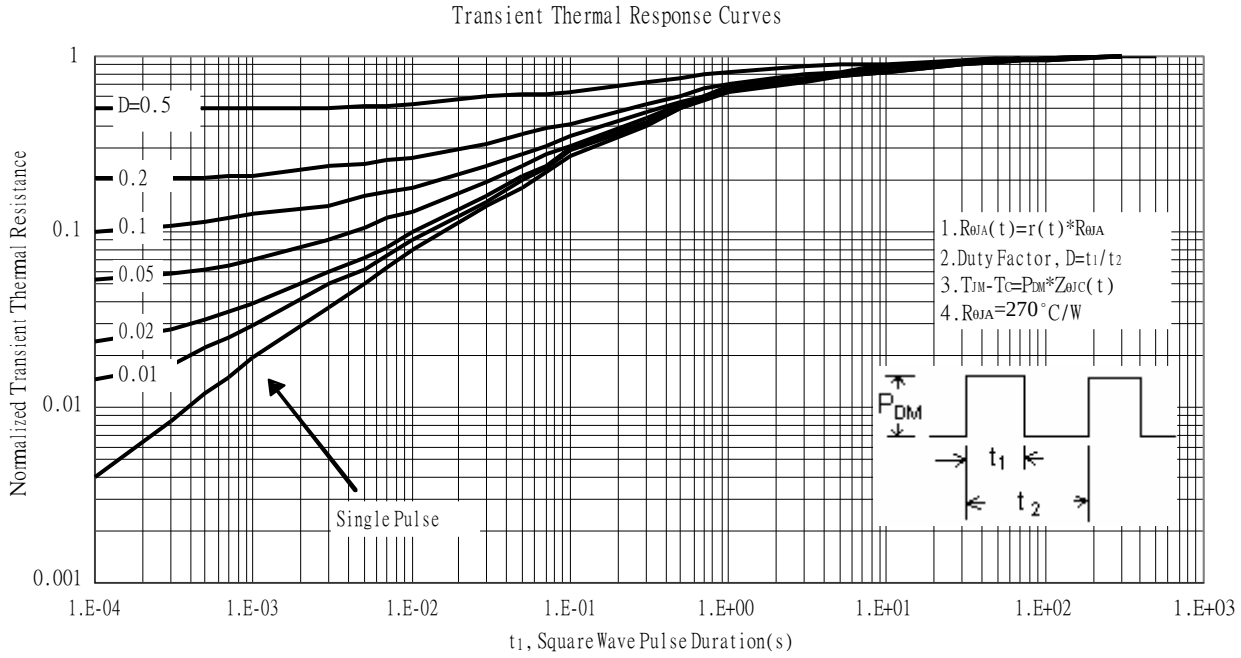


Maximum Drain Current vs JunctionTemperature

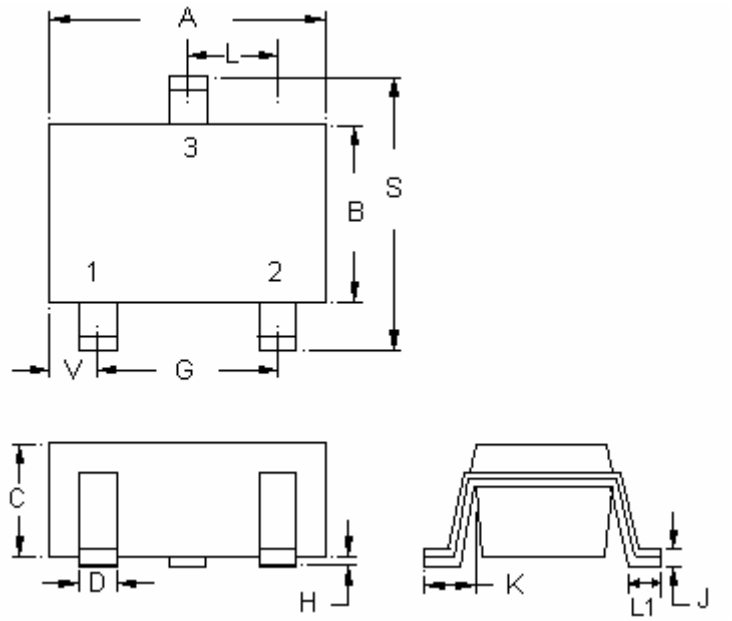


Typical Characteristics(Cont.)

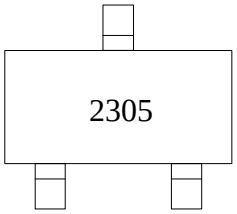




SOT-23 Dimension



Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package
Code: N3

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

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0669	1.20	1.70	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50