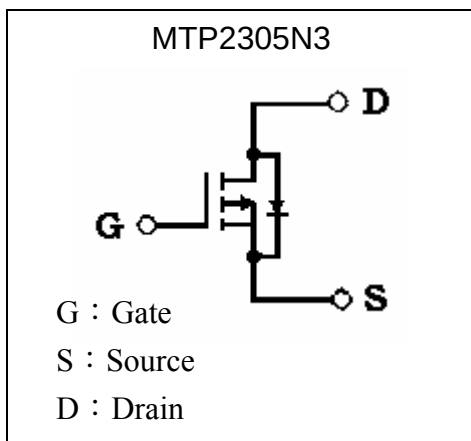
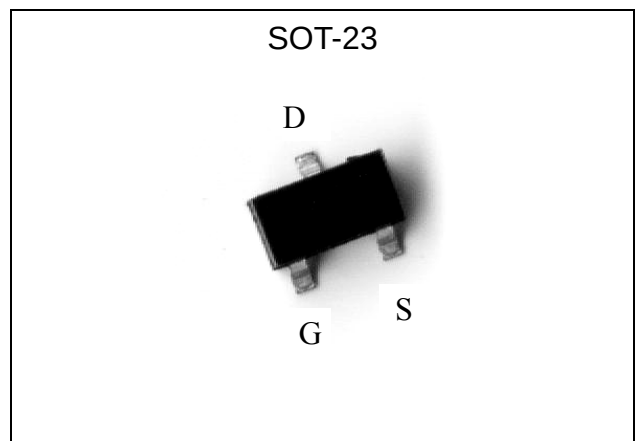


P-CHANNEL Enhancement Mode MOSFET

MTP2305N3

Features

- $V_{DS} = -20V$
 $R_{DS(ON)} = 65m\Omega @ V_{GS} = -4.5V, I_{DS} = -4.2A$
 $R_{DS(ON)} = 100m\Omega @ V_{GS} = -2.5V, I_{DS} = -2A$
- 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 package

Equivalent Circuit

Outline

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 @Ta=25°C (Note 1)	I_D	-4.2	A
Continuous Drain Current @Ta=70°C (Note 1)	I_D	-3.4	A
Pulsed Drain Current (Note 2)	I_{DM}	-10	A
Maximum Power Dissipation	P_D	1.38	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature	T_j, T_{stg}	-55~+150	°C

Note : 1. Surface mounted on 1 in² copper pad of FR-4 board, 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	$R_{th,ja}$	90	°C/W

Note : Surface mounted on 1 in² copper pad of FR-4 board, 270°C/W when mounted on minimum copper pad.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-20	-	-	V	V _{GS} =0, I _D =-250μA
ΔBV _{DSS} /ΔT _j	-	-0.1	-	V/°C	Reference to 25°C, I _D =-1mA
V _{GS(th)}	-0.5	-	-	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	μA	V _{DS} =-16V, V _{GS} =0, T _j =70°C
*R _{DS(ON)}	-	-	53	mΩ	I _D =-4.5A, V _{GS} =-10V
	-	-	65		I _D =-4.2A, V _{GS} =-4.5V
	-	-	100		I _D =-2.0A, V _{GS} =-2.5V
	-	-	250		I _D =-1.0A, V _{GS} =-1.8V
*G _{FS}	-	9	-	S	V _{DS} =-5V, I _D =-2.8A
Dynamic					
C _{iss}	-	740	-	pF	V _{DS} =-15V, V _{GS} =0, f=1MHz
C _{oss}	-	167	-		
C _{rss}	-	126	-		
*t _{d(ON)}	-	5.9	-	ns	V _{DS} =-15V, I _D =-4.2A, V _{GS} =-10V, R _D =3.6Ω, R _G =6Ω
*t _r	-	3.6	-		
*t _{d(OFF)}	-	32.4	-		
*t _f	-	2.6	-		
*Q _g	-	10.6	-	nC	V _{DS} =-16V, I _D =-4.2A, V _{GS} =-4.5V,
*Q _{gs}	-	2.32	-		
*Q _{gd}	-	3.68	-		
Source-Drain Diode					
*V _{SD}	-	-	-1.2	V	V _{GS} =0V, I _{SD} =-1.2A
*t _{rr}	-	27.7	-	ns	I _S =-4.2A, V _{GS} =0V, dI/dt=100A/μs
*Q _{rr}	-	22	-	nC	

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

Ordering Information

Device	Package	Shipping	Marking
MTP2305N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	2305

Characteristic Curves

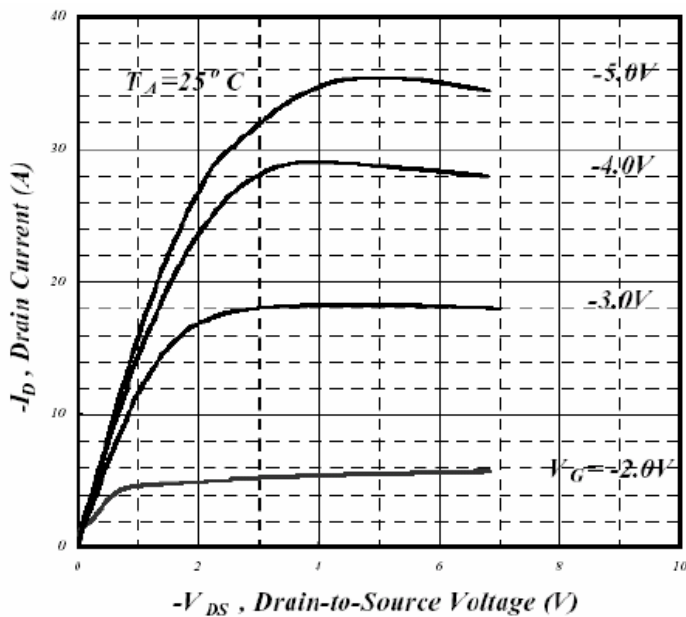


Fig 1. Typical Output Characteristics

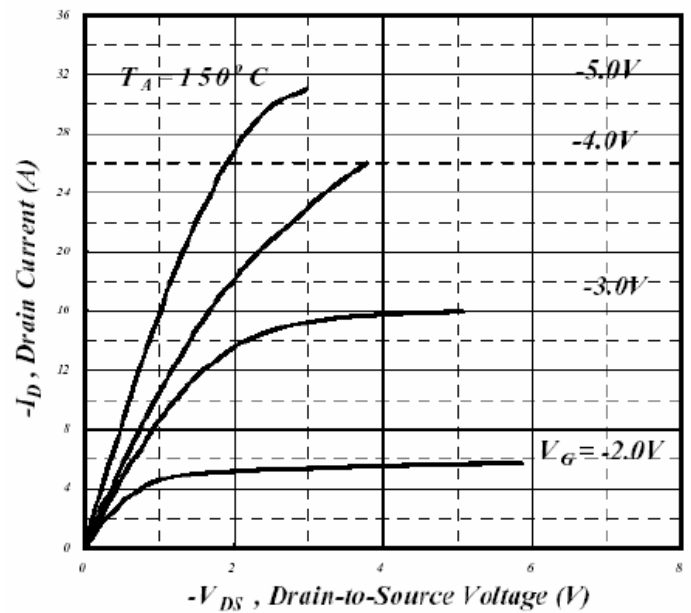


Fig 2. Typical Output Characteristics

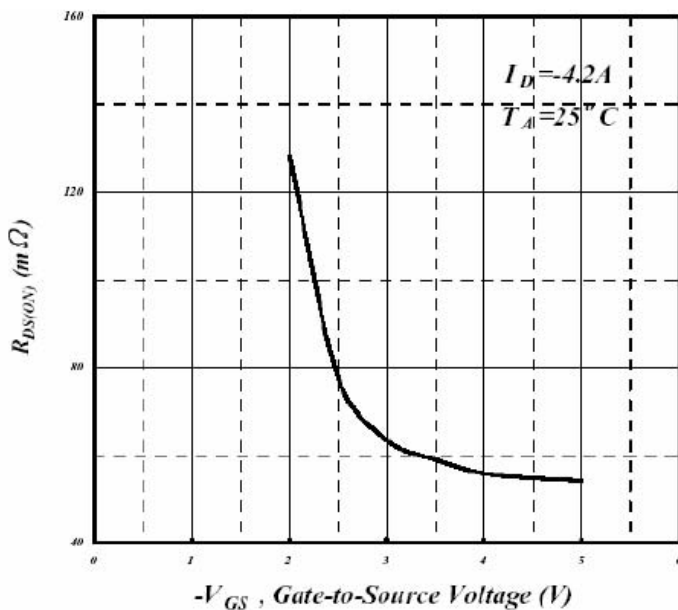


Fig 3. On-Resistance v.s. Gate Voltage

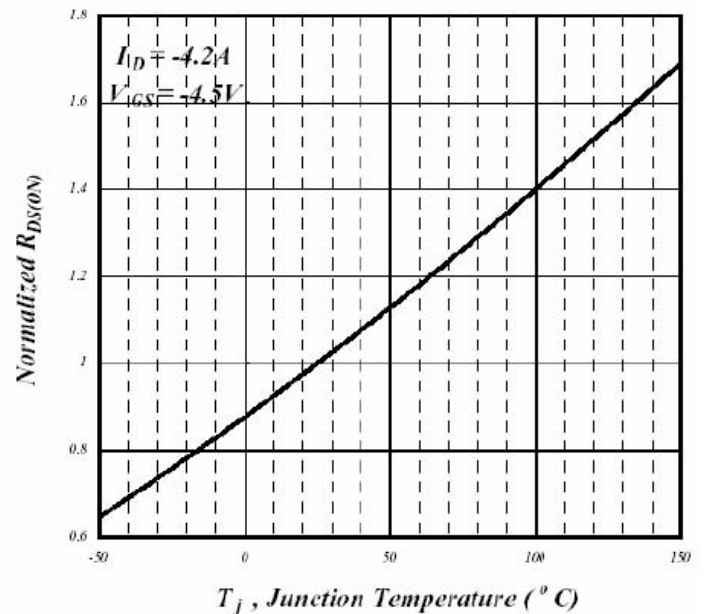


Fig 4. Normalized On-Resistance v.s. Junction Temperature

Characteristic Curves(Cont.)

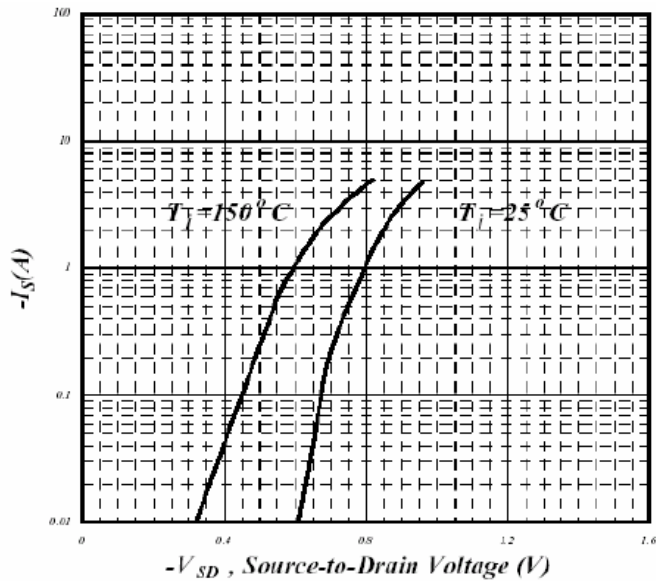


Fig 5. Forward Characteristic of Reverse Diode

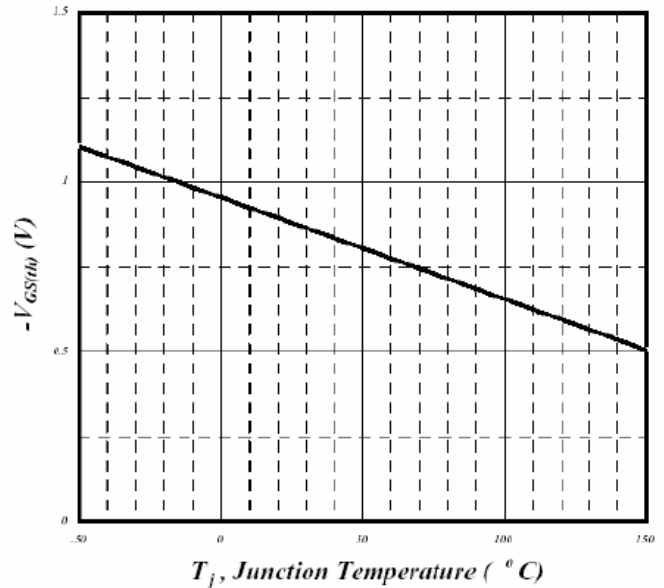


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

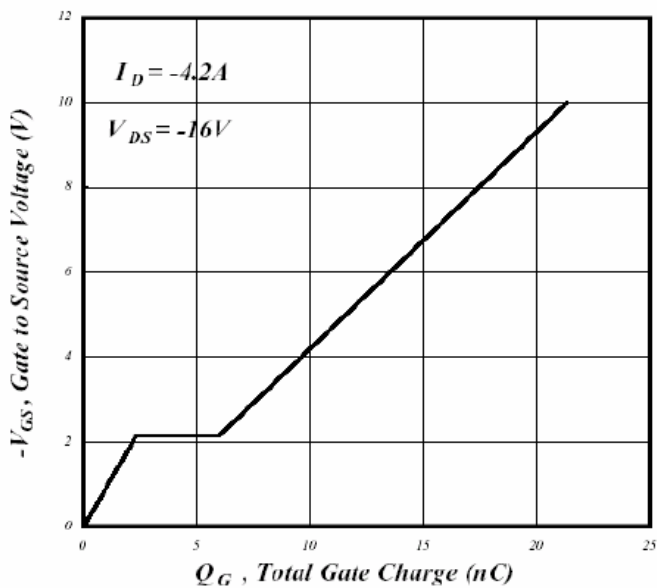


Fig 7. Gate Charge Characteristics

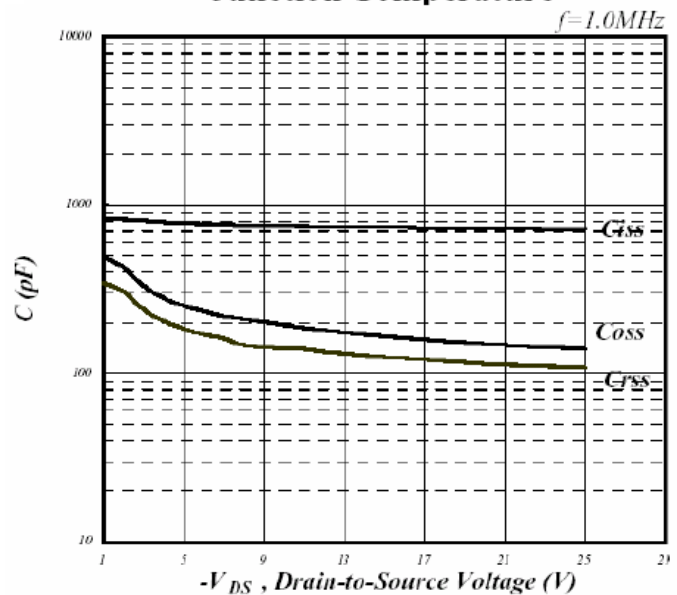


Fig 8. Typical Capacitance Characteristics

Characteristic Curves(Cont.)

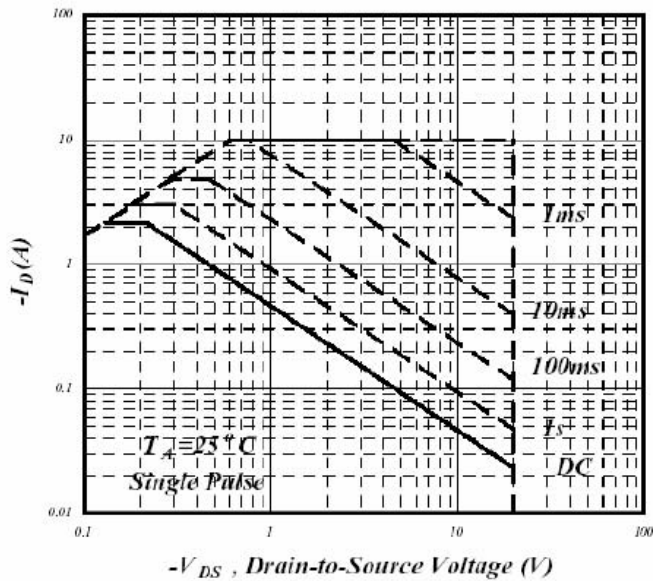


Fig 9. Maximum Safe Operating Area

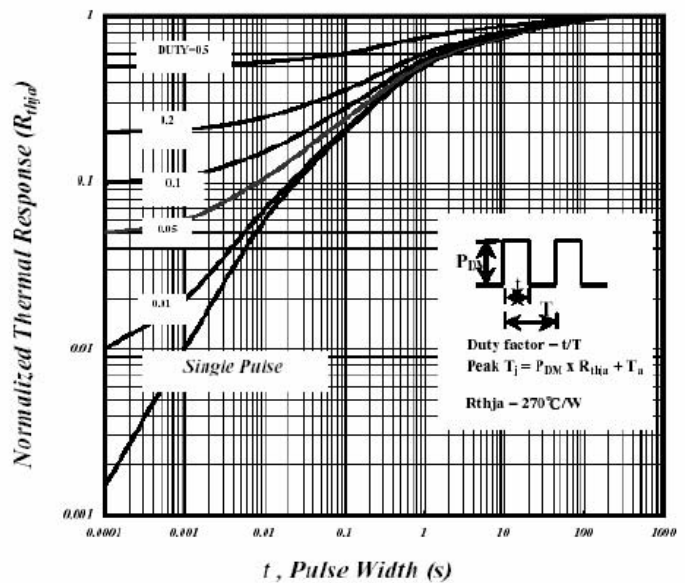


Fig 10. Effective Transient Thermal Impedance

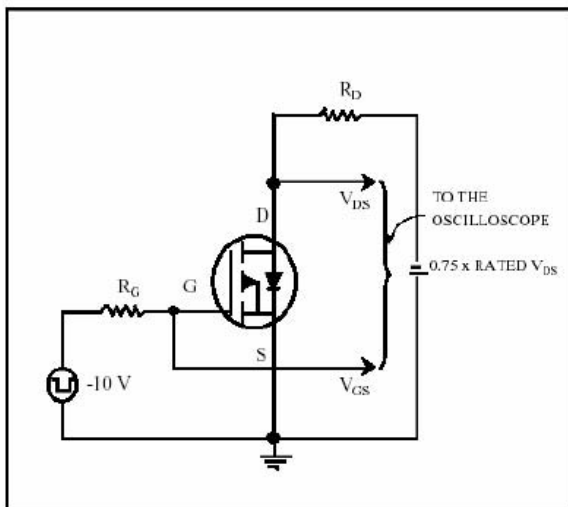


Fig 11. Switching Time Circuit

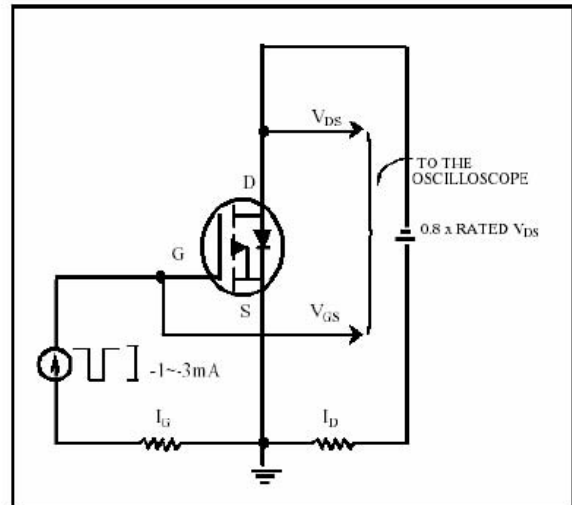
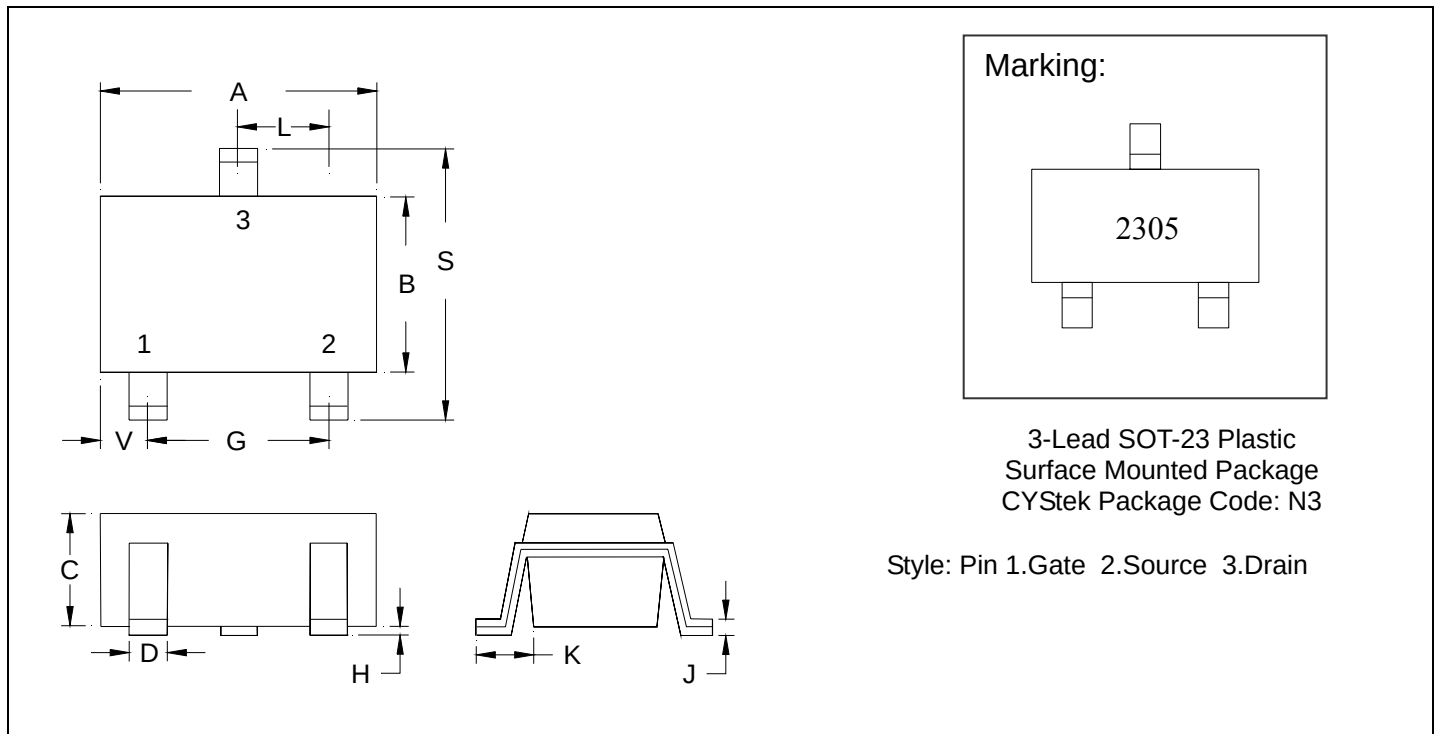


Fig 12. Gate Charge Circuit

SOT-23 Dimension



*: 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	0.0034	0.0070	0.085	0.177
B	0.0472	0.0630	1.20	1.60	K	0.0128	0.0266	0.32	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	0.1083	2.10	2.75
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	0.0040	0.013	0.10					

Notes: 1.Controlling dimension: millimeters.

2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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