

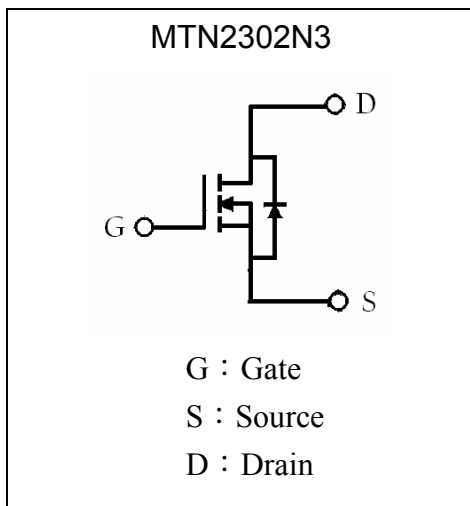
20V N-CHANNEL Enhancement Mode MOSFET

MTN2302N3

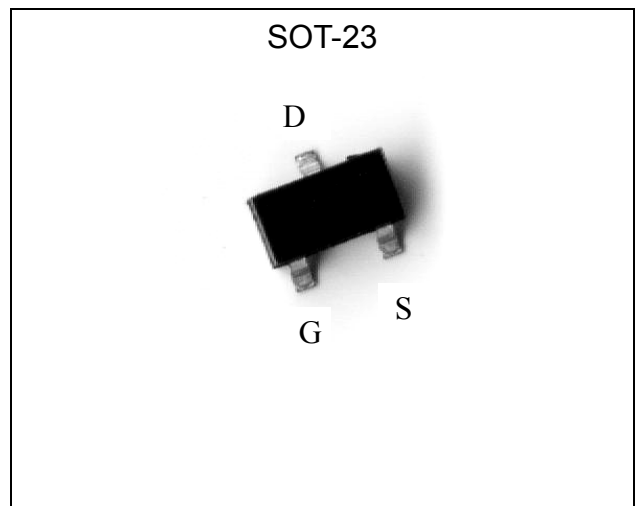
Features

- $V_{DS}=20V$
 $R_{DS(ON)}=65m\Omega @ V_{GS}=4.5V, I_{DS}=3.6A$
 $R_{DS(ON)}=95m\Omega @ V_{GS}=2.5V, I_{DS}=3.1A$
- Advanced trench process technology
- High density cell design for ultra low on resistance
- Excellent thermal and electrical capabilities
- Compact and low profile SOT-23 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}	± 8	V
Continuous Drain Current		I_D	2.4	A
Pulsed Drain Current		I_{DM}	10	A
Maximum Power Dissipation	Ta=25°C	P_D	1.25	W
	Ta=75°C		0.8	
Operating Junction Temperature		T_j	-55~+150	°C
Storage Temperature		T_{stg}	-55~+150	°C



Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient(PCB mounted)	$R_{th,ja}$	100	°C/W
Lead Temperature, for 5 second Soldering(1/8" from case)	T_L	260	°C

Note : Surface mounted on FR-4 board, $t \leq 5\text{sec}$.

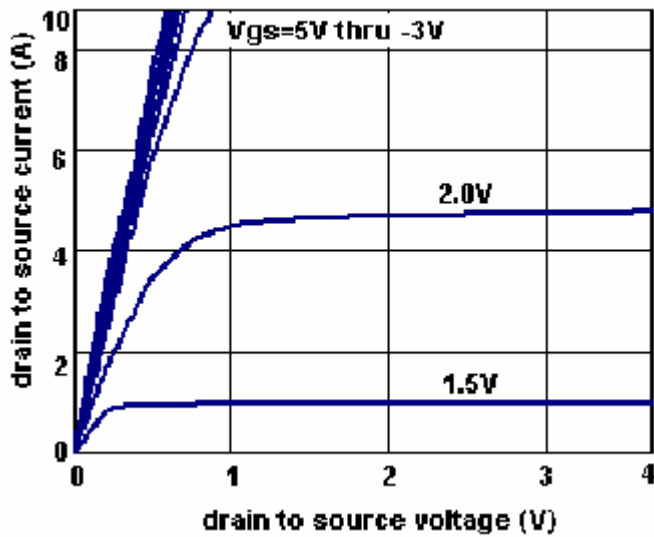
Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	20	-	-	V	V _{GS} =0, I _D =250μA
V _{GS(th)}	0.45	-	-	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS/F}	-	-	100	nA	V _{GS} =+8V, V _{DS} =0
I _{GSS/R}	-	-	-100	nA	V _{GS} =-8V, V _{DS} =0
I _{DSS}	-	-	1	μA	V _{DS} =20V, V _{GS} =0
*I _{D(ON)}	6	-	-	A	V _{DS} =5V, V _{GS} =4.5V
*R _{DS(ON)}	-	50	65	mΩ	I _D =3.6A, V _{GS} =4.5V
	-	75	95		I _D =3.1A, V _{GS} =2.5V
*G _{FS}	-	10	-	S	V _{DS} =5V, I _D =3.6A
Dynamic					
C _{iss}	-	450	-	pF	V _{DS} =10V, V _{GS} =0, f=1MHz
C _{oss}	-	70	-		
C _{rss}	-	43	-		
t _{d(ON)}	-	7	15	ns	V _{DD} =10V, I _D =1A, R _L =10Ω V _{GEN} =4.5V, R _G =6Ω
t _r	-	55	80		
t _{d(OFF)}	-	16	60		
t _f	-	10	25		
Q _g	-	5.2	10	nC	V _{DS} =10V, I _D =3.6A, V _{GS} =4.5V,
Q _{gs}	-	0.65	-		
Q _{gd}	-	1.5	-		
Source-Drain Diode					
I _{SD}	-	-	1.6	A	-
V _{SD}	-	0.75	1.2	V	V _{GS} =0V, I _{SD} =1A

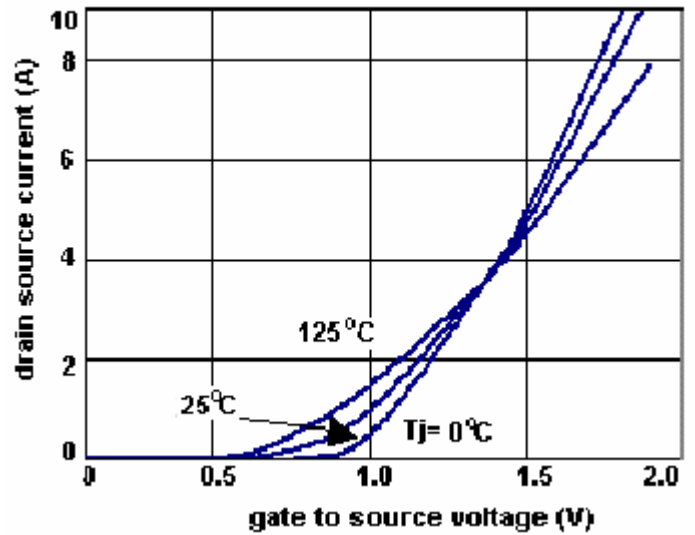
*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Characteristic Curves

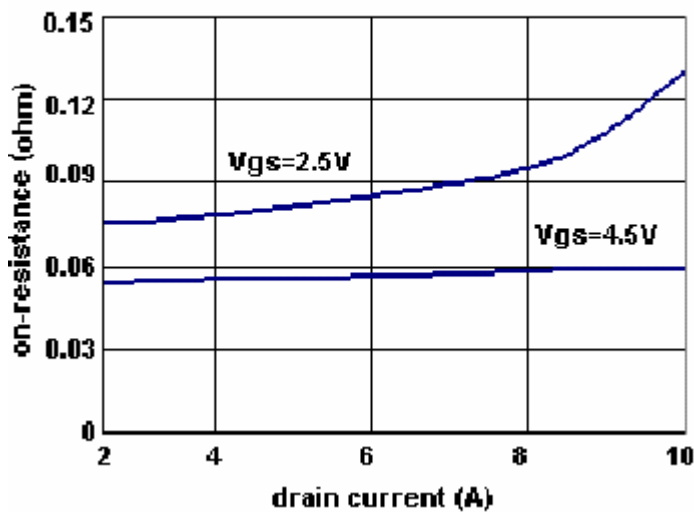
Output Characteristic



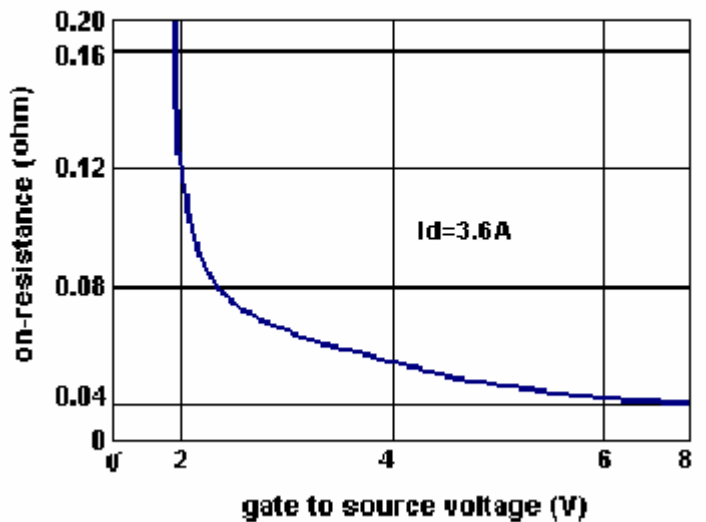
Transfer Characteristic



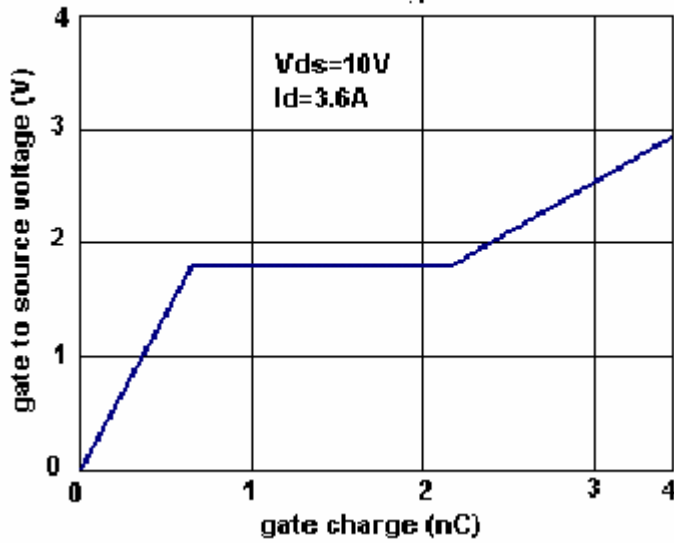
On Resistance vs Drain Current



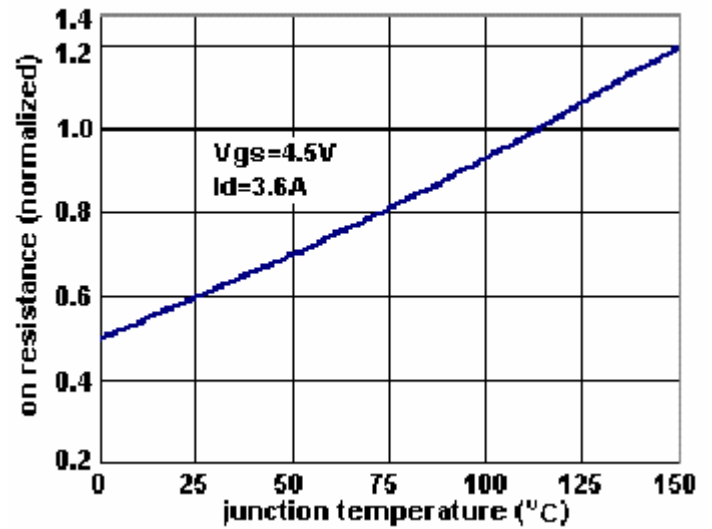
On Resistance vs Gate-Source



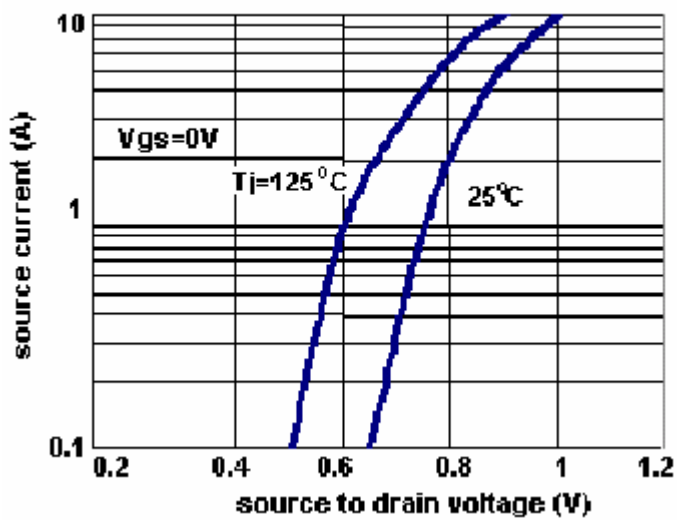
Gate Charge



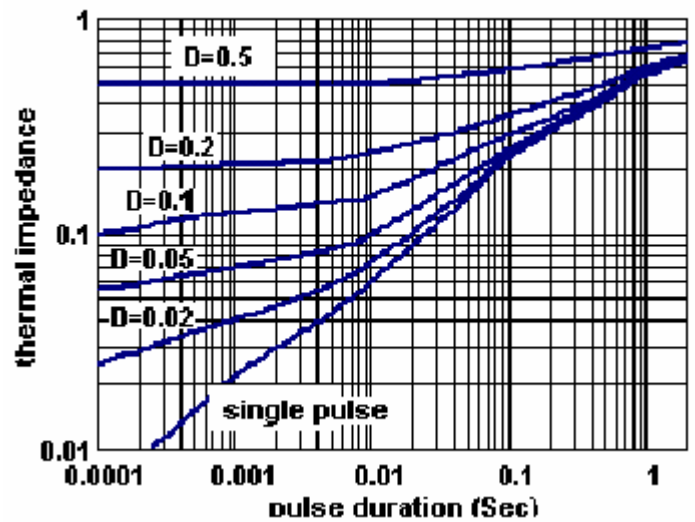
On Resistance vs Junction temp.



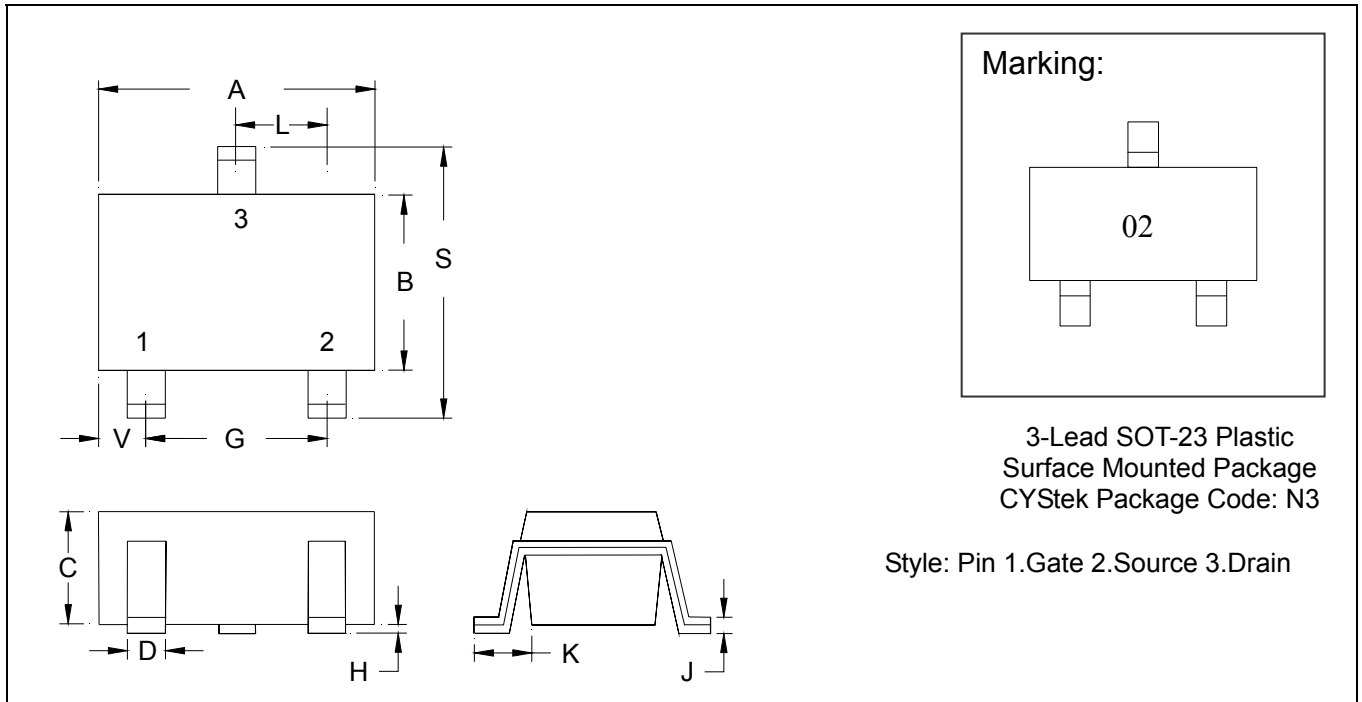
Source Drain Diode Forward Voltage



Transient Thermal Impedance



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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