20V N-CHANNEL Enhancement Mode MOSFET

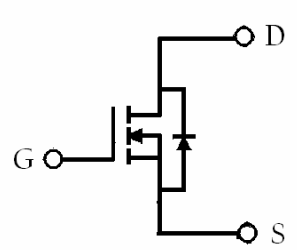
MTN2302N3

Features

- V_{DS}=20V
  $R_{DS(ON)}$=65mΩ@V_{GS}=4.5V, I_{DS}=3.6A
  $R_{DS(ON)}$=95mΩ@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

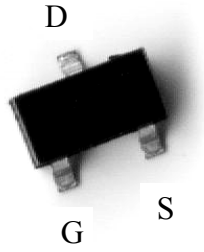
MTN2302N3



G：Gate
S：Source
D：Drain

Outline

SOT-23



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℃	P_D	1.25	W
	Ta=75℃		0.8	
Operating Junction Temperature		Tj	-55~+150	°C
Storage Temperature		Tstg	-55~+150	°C

Thermal Performance

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

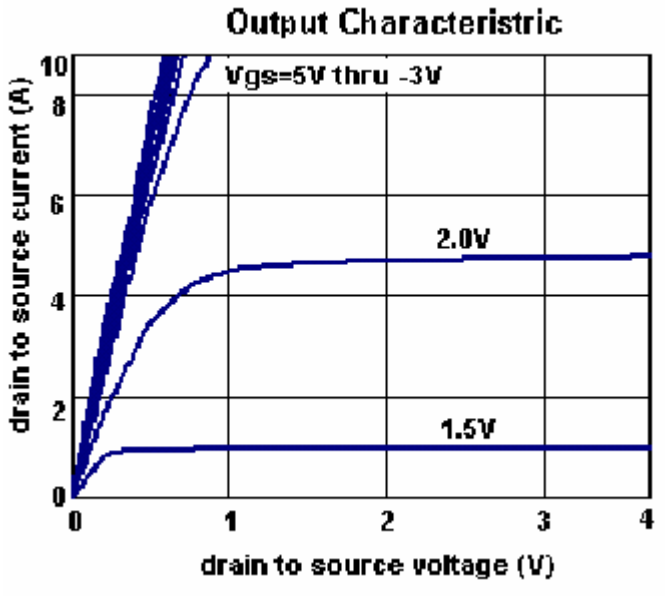
Note : Surface mounted on FR-4 board, t≦5sec.

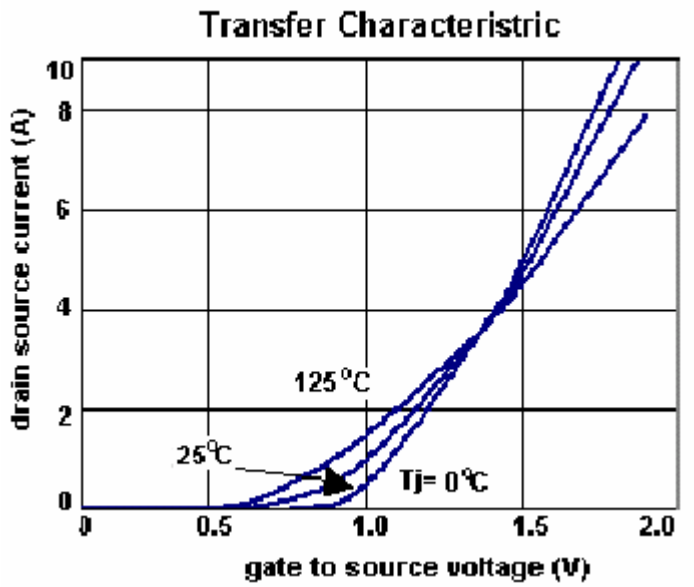
Electrical Characteristics (Ta=25°C)

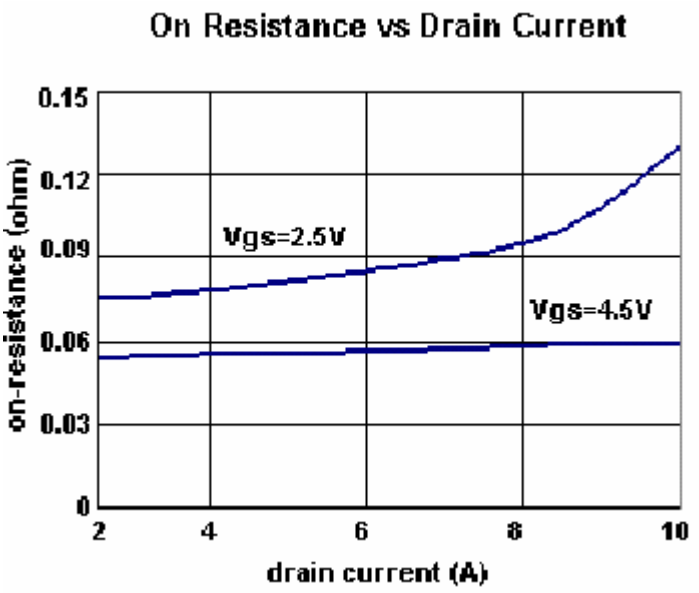
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	0.45	-	-	V	V_{DS}=V_{GS}, I_D=250μA
$I_{GSS/F}$	-	-	100	nA	V_{GS}=+8V, V_{DS}=0
$I_{GSS/R}$	-	-	-100	nA	V_{GS}=-8V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=20V, V_{GS}=0
*$I_{D(ON)}$	6	-	-	A	V_{DS}=5V, 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					
Ciss	-	450	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
Coss	-	70	-		
Crss	-	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		
Qg	-	5.2	10	nC	V_{DS}=10V, I_D=3.6A, V_{GS}=4.5V,
Qgs	-	0.65	-		
Qgd	-	1.5	-		
Source-Drain Diode					
I_{SD}	-	-	1.6	A	-
V_{SD}	-	0.75	1.2	V	V_{GS}=0V, I_{SD}=1A

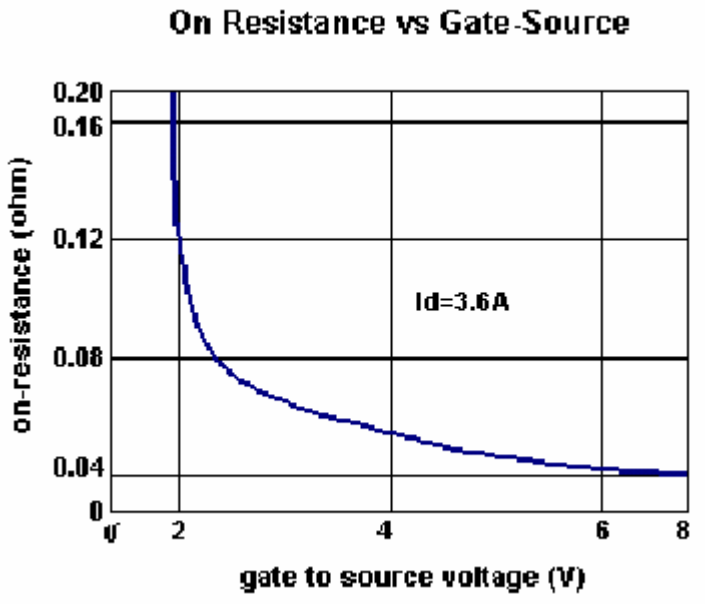
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

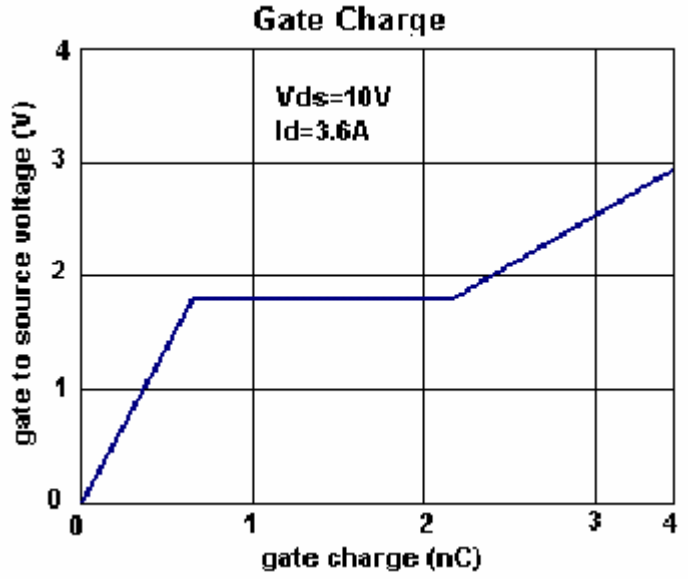
Characteristic Curves

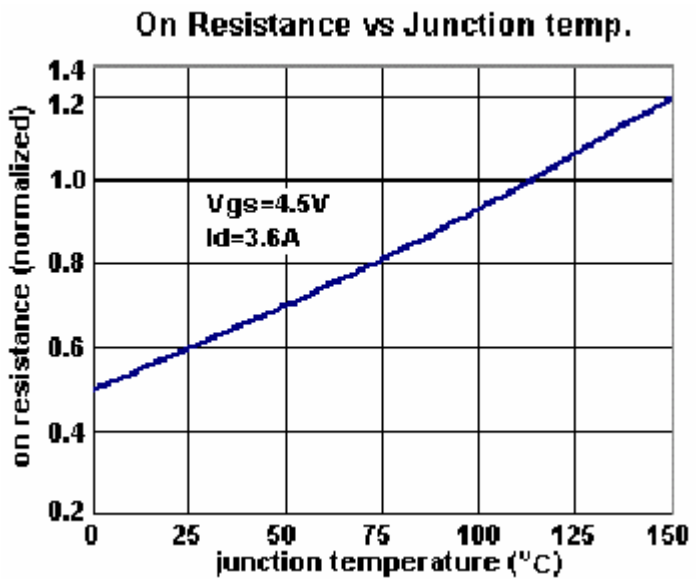


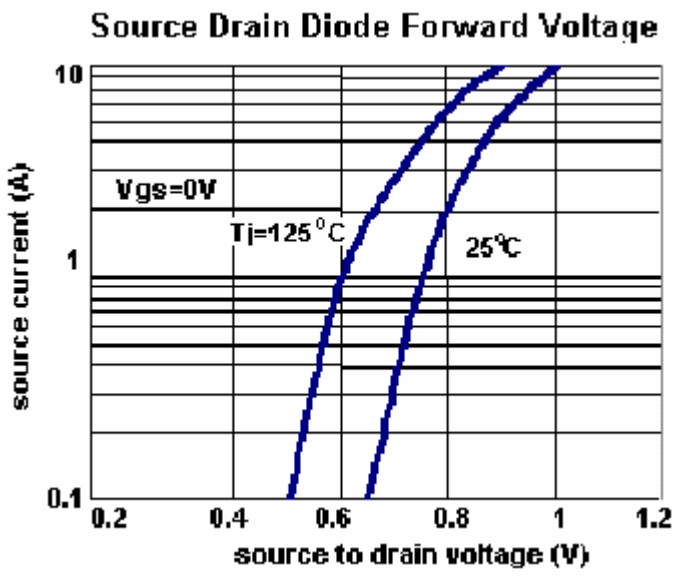


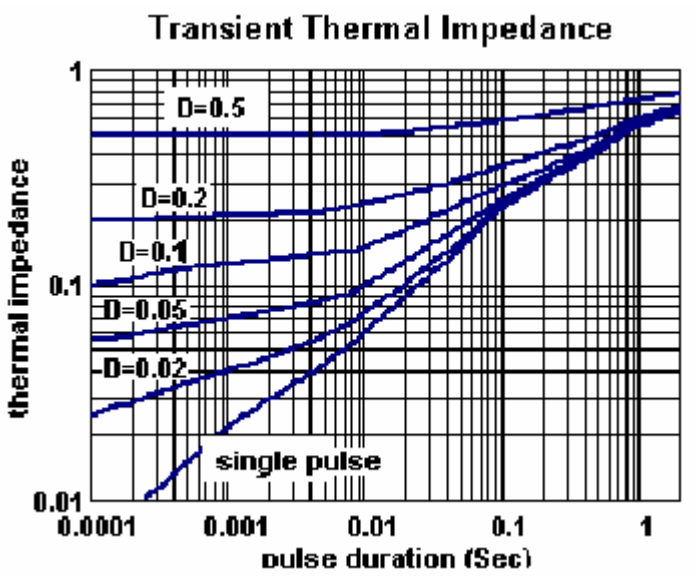




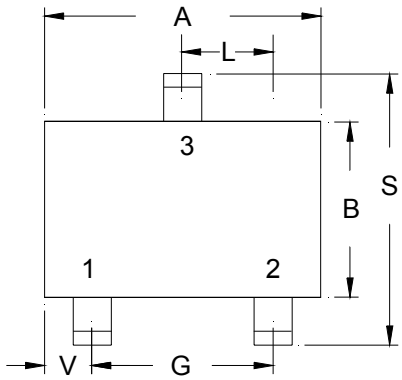

Gate Charge
Vds=10V
Id=3.6A
gate to source voltage (V)
gate charge (nC)
0
1
2
3
4

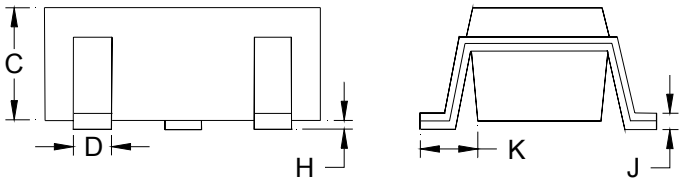

On Resistance vs Junction temp.
Vgs=4.5V
Id=3.6A
on resistance (normalized)
junction temperature (°C)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0
25
50
75
100
125
150


Source Drain Diode Forward Voltage
Vgs=0V
Tj=125°C
25℃
source current (A)
source to drain voltage (V)
0.1
1
10
0.2
0.4
0.6
0.8
1
1.2

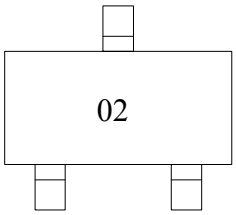

Transient Thermal Impedance
D=0.5
D=0.2
D=0.1
D=0.05
D=0.02
single pulse
thermal impedance
pulse duration (Sec)
0.01
0.1
1
0.0001
0.001
0.01
0.1
1

SOT-23 Dimension





Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package
CYStek 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	0.0034	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