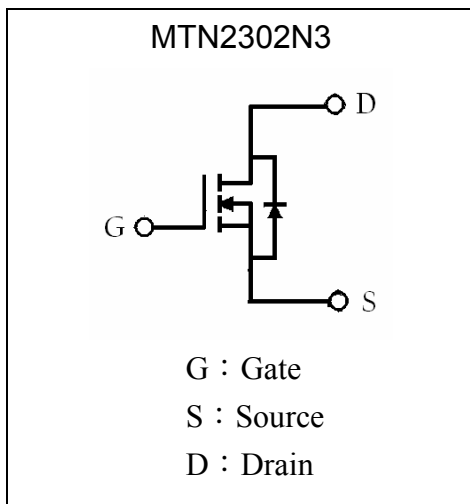
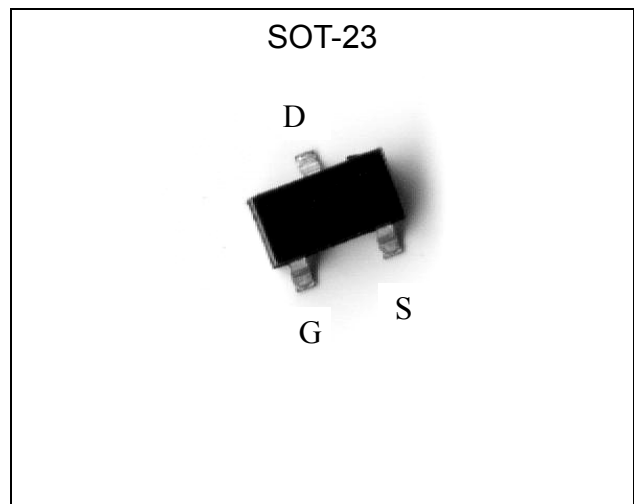


20V N-CHANNEL Enhancement Mode MOSFET

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 | P_D | Ta=25°C | W |
| | | Ta=75°C | |
| 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 ≤ 5sec.

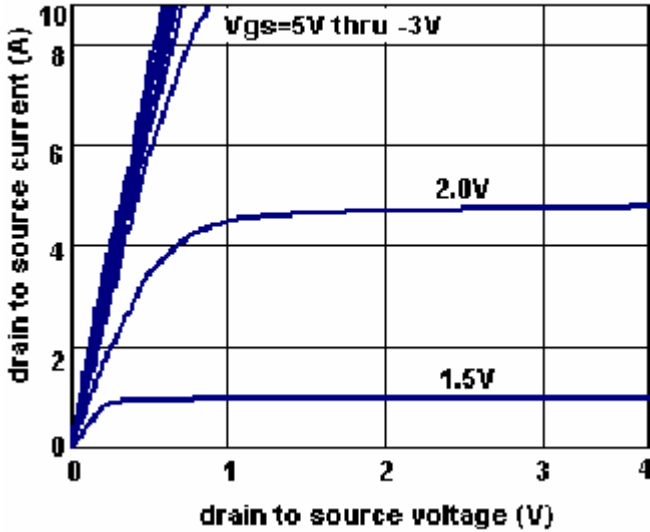
Electrical Characteristics (Ta=25°C)

| 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 | | | | | |
| 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 |

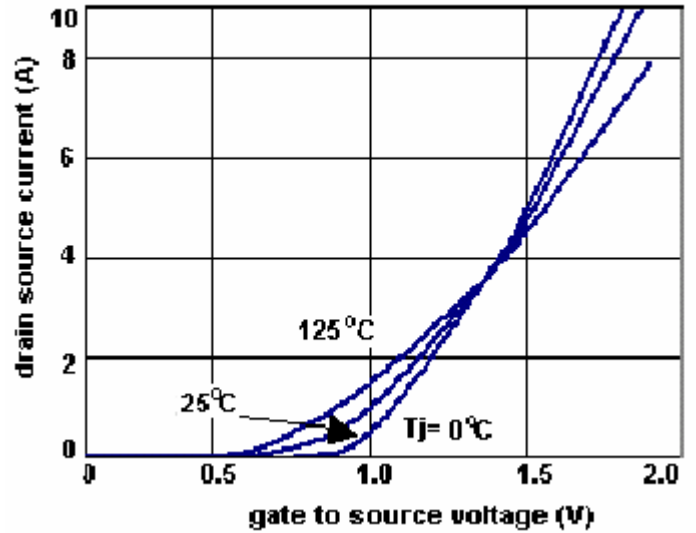
*Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

Characteristic Curves

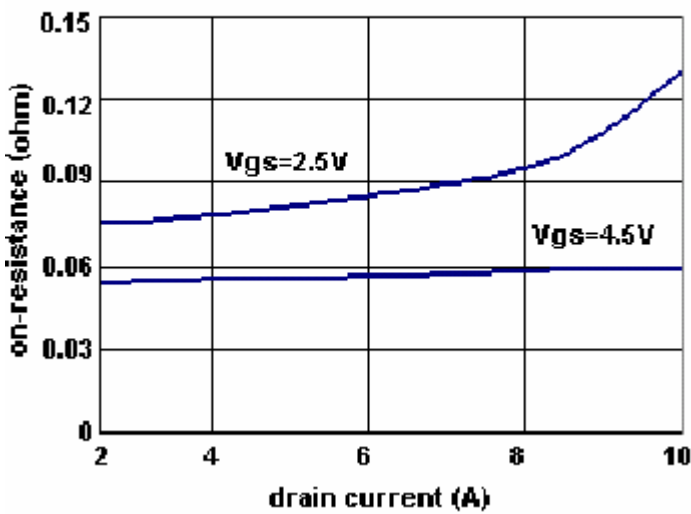
Output Characteristic



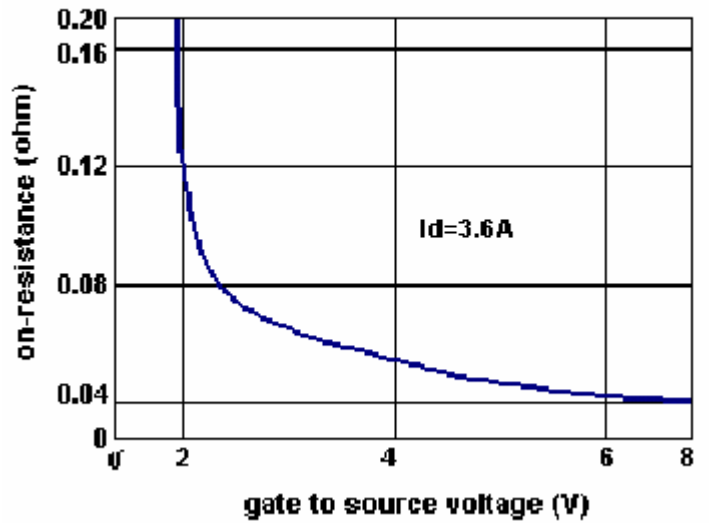
Transfer Characteristic



On Resistance vs Drain Current

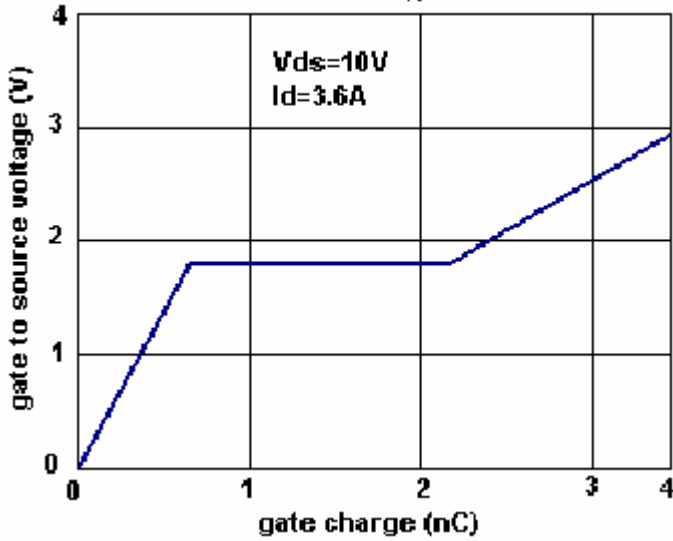


On Resistance vs Gate-Source

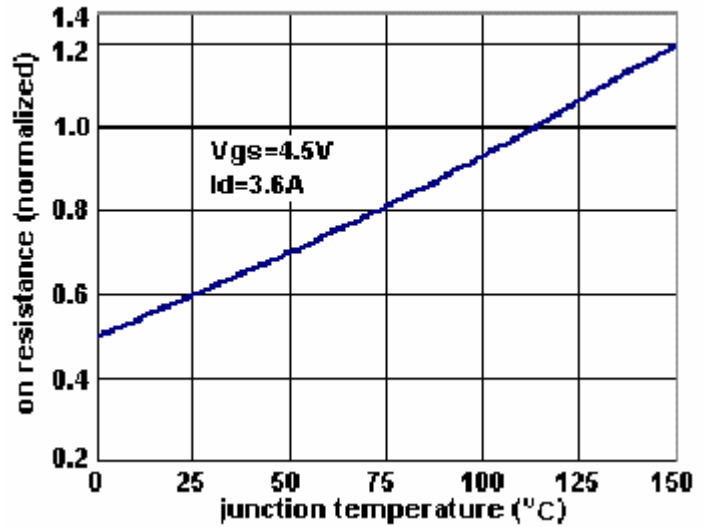




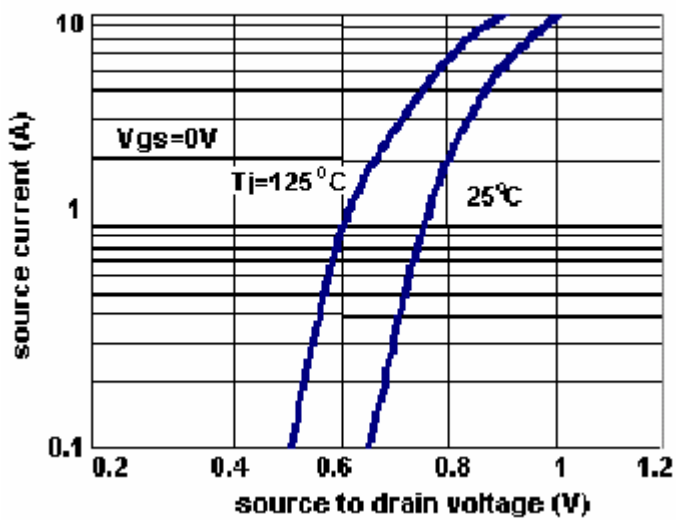
Gate Charge



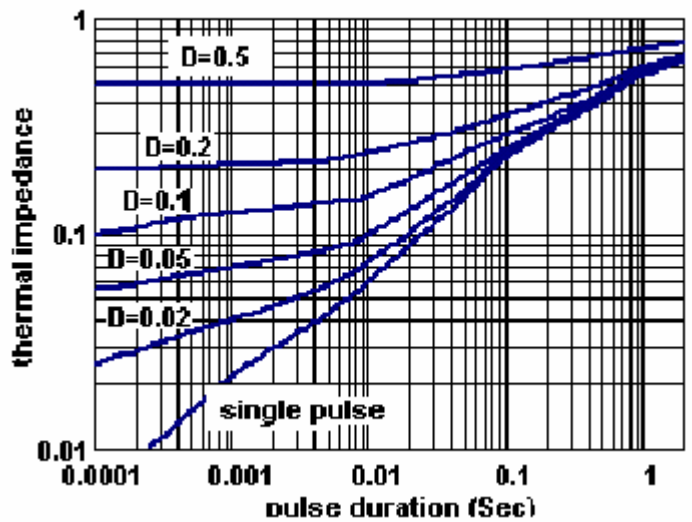
On Resistance vs Junction temp.



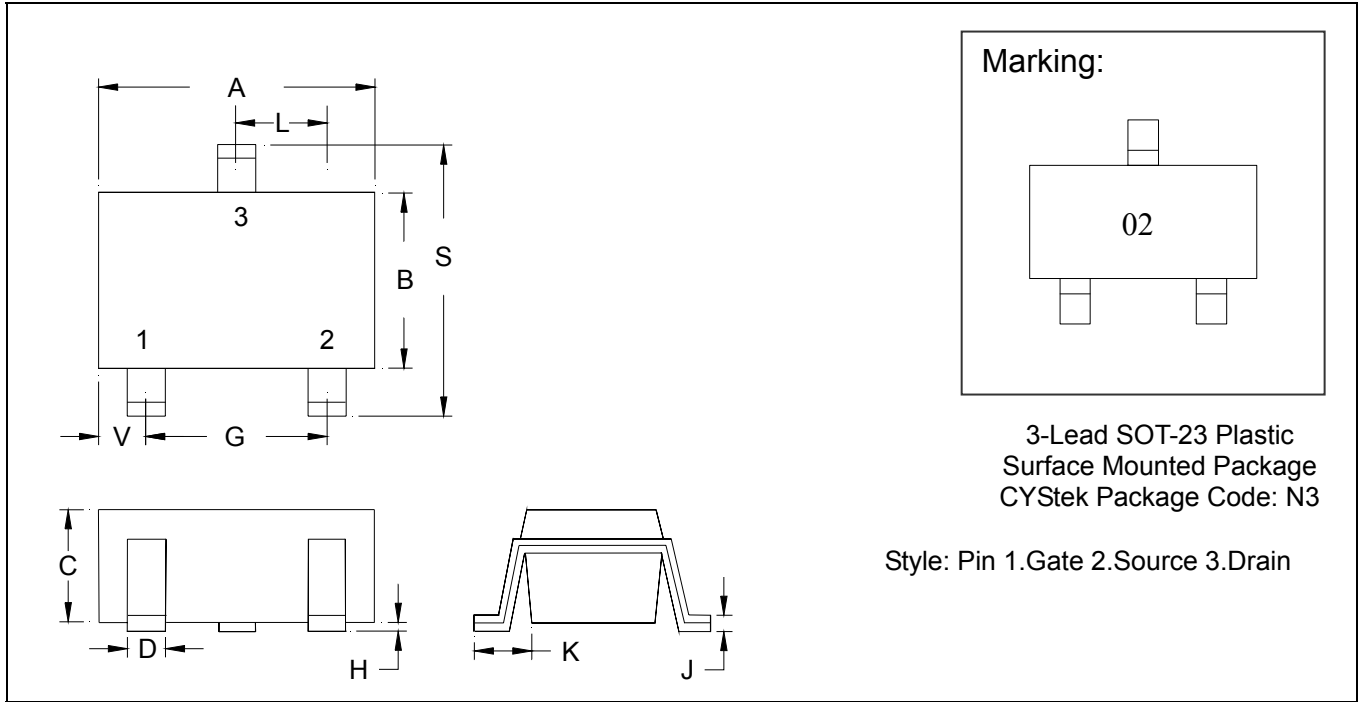
Source Drain Diode Forward Voltage



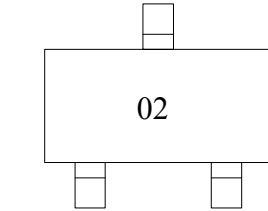
Transient Thermal Impedance



SOT-23 Dimension



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:**
- Controlling dimension: millimeters.
 - Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 - 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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