TOPAZ SEMICONDUCTOR

# SD1100, SD1101

# N-CHANNEL ENHANCEMENT-MODE HIGH-VOLTAGE D-MOS POWER FETS

## ABSOLUTE MAXIMUM RATINGS

($T_A$ = +25°C unless otherwise noted)

Drain-Source Voltage
- SD1100 ..... 450V
- SD1101 ..... 400V

Drain-Gate Voltage ($V_{GS}$ = 0)
- SD1100 ..... 450V
- SD1101 ..... 400V

Gate-Source Voltage ..... ±30V

Continuous Drain Current
- SD1100DD, SD1101DD ..... 80mA
- SD1100HD, SD1101HD ..... 140mA

Peak Drain Current
- SD1100DD, SD1101DD ..... 250mA
- SD1100HD, SD1101HD ..... 300mA

Continuous Device Dissipation
- SD1100DD, SD1101DD ..... 360mW
- SD1100HD, SD1101HD ..... 800mA

Linear Derating Factor
- SD1100DD, SD1101DD ..... 2.9mW/°C
- SD1100HD, SD1101HD ..... 6.4mW/°C

Operating Junction Temperature Range ..... −55 to +150°C

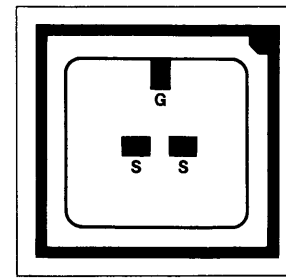
Storage Temperature Range ..... −55 to +150°C

Lead Temperature (1/16″ from mounting surface for 30 Sec) ..... +260°C

## ORDERING INFORMATION

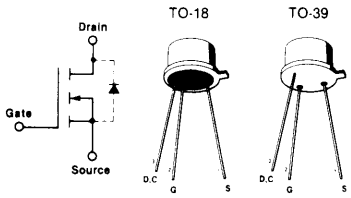
| Sorted Chips in Carriers | SD1100CHP | SD1101CHP |
|---|---|---|
| TO-18 Package | SD1100DD | SD1101DD |
| TO-39 Package | SD1100HD | SD1101HD |
| Description | 450V, 35 ohm | 400V, 25 ohm |

## CHIP CONFIGURATION



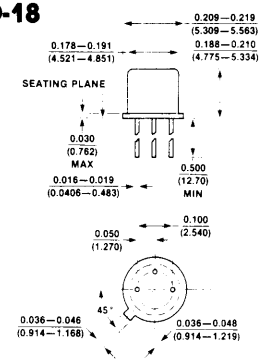

**Dimensions: .054 x .056 x .013 inches**
**Drain is backside contact.**

## SCHEMATIC DIAGRAM/ PACKAGES



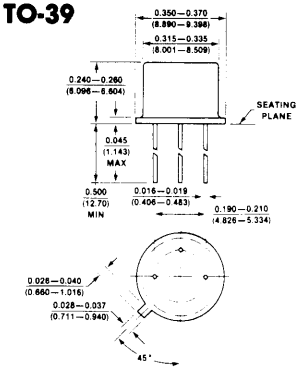

**Body Internaly connected to Source.**
**Drain common to Case.**

## PACKAGE DIMENSIONS TO-18




**All dimensions in inches and (millimeters)**

## PACKAGE DIMENSIONS TO-39




**All dimensions in inches and (millimeters)**

**Topaz Semiconductor,** 1971 N. Capitol Avenue, San Jose, CA 95132-3799, 408/942-9100 TWX: 910-338-0025

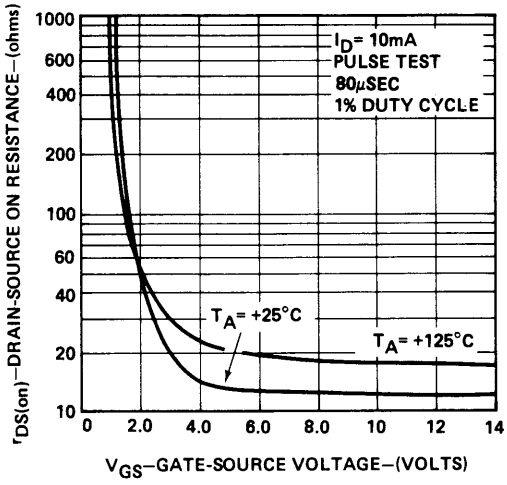
## ELECTRICAL CHARACTERISTICS ($T_A$ = +25°C unless otherwise noted)

| # | | CHARACTERISTIC | SD1100 | | | SD1101 | | | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | | |
| 1 | STATIC | $BV_{DSS}$ Drain-Source Breakdown Voltage | 450 | 475 | | 400 | 425 | | V | $I_D$ = 10 μ A, $V_{GS}$ = 0 |
| 2 | STATIC | $V_{GS(th)}$ Gate-Source Threshold Voltage | 1.0 | 3.0 | 5.0 | 1.0 | 3.0 | 5.0 | V | $I_D$ = 10μ A, $V_{DS}$ = $V_{GS}$ |
| 3 | STATIC | $I_{GBS}$ Gate-Body Leakage Current | | .03 | 1.0 | | .03 | 1.0 | nA | $V_{GS}$ = 20V, $V_{DS}$ = 0 |
| 4 | STATIC | $I_{DSS}$ Drain-Source OFF Leakage Current | | 2.0 | 200 | | | | nA | $V_{DS}$ = 360V, $V_{GS}$ = 0 |
| 5 | STATIC | $I_{DSS}$ Drain-Source OFF Leakage Current | | | | | 2.0 | 200 | nA | $V_{DS}$ = 320V, $V_{GS}$ = 0 |
| 6 | STATIC | $I_{D(on)}$ ON Drain Current | 250 | 400 | | 250 | 400 | | mA | $V_{DS}$ = 25V, $V_{GS}$ = 15V (Note 1) |
| 7 | STATIC | $r_{DS(on)}$ Drain-Source ON Resistance | | 25 | 35 | | 20 | 25 | ohms | $I_D$ = 10mA, $V_{GS}$ = 15V |
| 8 | DYNAMIC | $g_{fs}$ Common-Source Forward Transconductance | | 210 | | | 210 | | mmhos | $V_{DS}$ = 25V, $I_D$ = 250mA f = 1KHz (Note 1) |
| 9 | DYNAMIC | $C_{iss}$ Common-Source Input Capacitance | | 80 | | | 80 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |
| 10 | DYNAMIC | $C_{rss}$ Common-Source Reverse Transfer Capacitance | | 1.3 | | | 1.3 | | | |
| 11 | DYNAMIC | $C_{oss}$ Common-Source Output Capacitance | | 10.5 | | | 10.5 | | | |

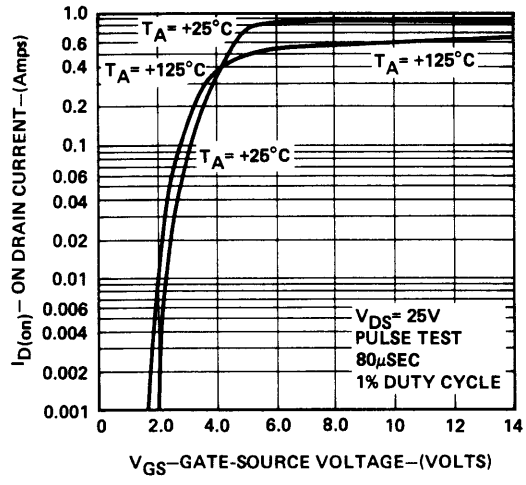
**Note 1:** Pulse Test 80μ Sec, 1% Duty Cycle

## TYPICAL PERFORMANCE CHARACTERISTICS ($T_A$ = +25°C unless otherwise specified)

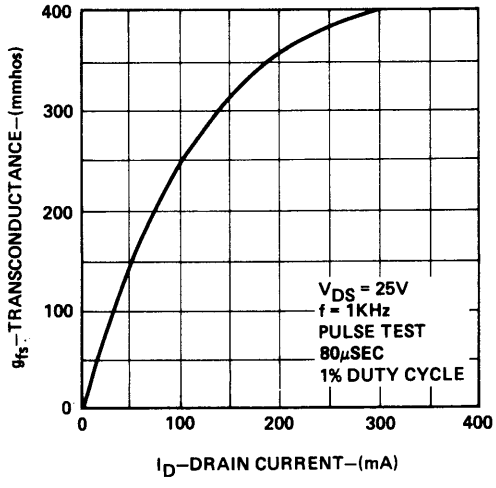
**DRAIN-SOURCE ON RESISTANCE —vs— GATE-SOURCE VOLTAGE**




**ON DRAIN CURRENT —vs— GATE-SOURCE VOLTAGE**




**FORWARD TRANSCONDUCTANCE —vs— ON DRAIN CURRENT**



TOPAZ SEMICONDUCTOR

# SD1102, SD1112, SD1113

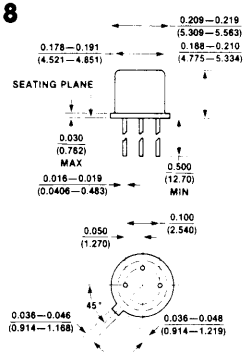
# N-CHANNEL ENHANCEMENT-MODE HIGH-VOLTAGE D-MOS POWER FETs

## ORDERING INFORMATION

| Sorted Chips in Carriers | SD1102CHP | SD1112CHP | SD1113CHP |
|---|---|---|---|
| TO-18 Package | SD1102DD | SD1112DD | SD1113DD |
| TO-39 Package | SD1102HD | SD1112HD | SD1113HD |
| TO-92 Package | SD1102BD | SD1112BD | SD1113BD |
| Description | 250V, 10 ohms | 200V, 7.0 ohms | 200V, 10 ohms |

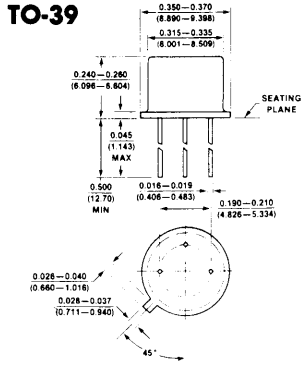
## PACKAGE DIMENSIONS

### TO-18



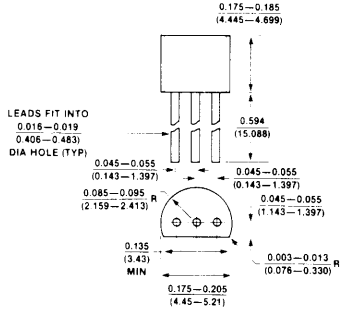

All dimensions in inches and (millimeters)

### TO-39



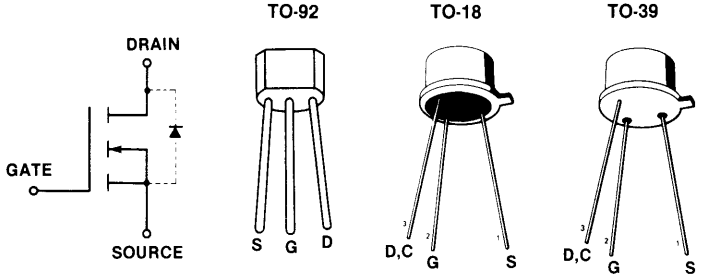

All dimensions in inches and (millimeters)

### TO-92

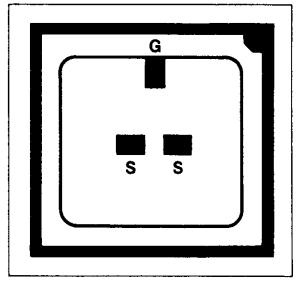



All dimensions in inches and (millimeters)

## SCHEMATIC DIAGRAM/PACKAGES




## CHIP CONFIGURATION




Dimensions: .054 x .056 x .013 inches
Drain is backside contact.

**Topaz Semiconductor,** 1971 N. Capitol Avenue, San Jose, CA 95132-3799, 408/942-9100 TWX: 910-338-0025

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = +25°C unless otherwise noted)

Drain-Source Voltage
- SD1102 ..... 250V
- SD1112, SD1113 ..... 200V

Drain-Gate Voltage ($V_{GS}$ = 0)
- SD1102 ..... 250V
- SD1112, SD1113 ..... 200V

Gate-Source Voltage ..... ±30V

Continuous Drain Current

| | $T_A$ = 25°C | $T_C$ = 25°C |
|---|---|---|
| SD1102BD, SD1113BD | .13 | .23A |
| SD1112BD | .15 | .27A |
| SD1102DD, SD1113DD | .14 | .31A |
| SD1112DD | .16 | .37A |
| SD1102HD, SD1113HD | .23 | .57A |
| SD1112HD | .27 | .69A |

Peak Pulsed Drain Current ..... 0.5A

Continuous Device Dissipation

| | $T_A$ = +25°C | $T_C$ = +25°C | |
|---|---|---|---|
| SD1102/1112/1113BD | 0.30 | 1.0 | W |
| SD1102/1112/1113DD | 0.36 | 1.8 | W |
| SD1102/1112/1113HD | 1.0 | 6.25 | W |

Linear Derating Factor

| | $T_A$ = +25°C | $T_C$ = +25°C | |
|---|---|---|---|
| SD1102/1112/1113BD | 2.4 | 8.0 | mW/°C |
| SD1102/1112/1113DD | 2.9 | 14.4 | mW/°C |
| SD1102/1112/1113HD | 8.0 | 50 | mW/°C |

Operating Junction Temperature Range ..... −55 to +150°C

Storage Temperature Range ..... −55 to +150°C

Lead Temperature (1/16" from mounting surface for 30 Sec) ..... +260°C

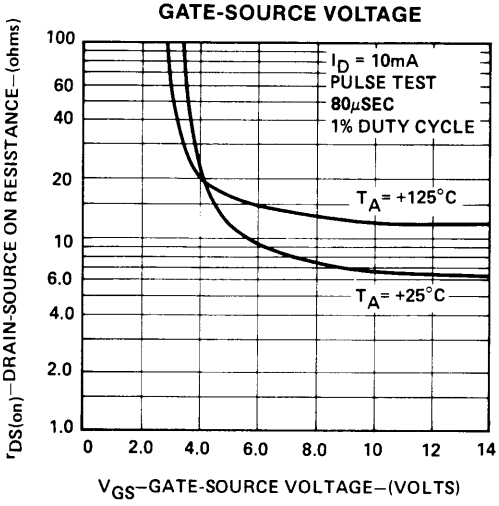
## ELECTRICAL CHARACTERISTICS ($T_A$ = +25°C unless otherwise noted)

| # | | CHARACTERISTIC | | SD1102 MIN | SD1102 TYP | SD1102 MAX | SD1112, SD1113 MIN | SD1112, SD1113 TYP | SD1112, SD1113 MAX | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | STATIC | $BV_{DSS}$ Drain-Source Breakdown Voltage | | 250 | 270 | | 200 | 250 | | V | $I_D$ = 10μA, $V_{GS}$ = 0 |
| 2 | STATIC | $V_{GS(th)}$ Gate-Source Threshold Voltage | | 1.0 | 3.0 | 5.0 | 1.0 | 3.0 | 5.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 10μA |
| 3 | STATIC | $I_{GBS}$ Gate-Body Leakage Current | | | .03 | 1.0 | | .03 | 1.0 | nA | $V_{GS}$ = 20V, $V_{DS}$ = 0 |
| 4 | STATIC | $I_{DSS}$ Drain-Source OFF Leakage Current | | | 0.1 | 1.0 | | | | μA | $V_{DS}$ = 200V; $V_{GS}$ = 0 |
| 5 | STATIC | | | | | | | 0.1 | 1.0 | μA | $V_{DS}$ = 160V; $V_{GS}$ = 0 |
| 6 | STATIC | $I_{D(on)}$ ON Drain Current | | 0.5 | | | 0.5 | | | A | $V_{DS}$ = 25V, $V_{GS}$ = 15V (Note 1) |
| 7 | STATIC | $r_{DS(on)}$ Static Drain-Source ON Resistance | SD1102 | | 8.0 | 10 | | | | ohms | $I_D$ = 10mA, $V_{GS}$ = 15V (Note 1) |
| 8 | STATIC | | SD1112 | | | | | 6.0 | 7.0 | ohms | $I_D$ = 10mA, $V_{GS}$ = 15V (Note 1) |
| 9 | STATIC | | SD1113 | | | | | 7.0 | 10 | ohms | $I_D$ = 10mA, $V_{GS}$ = 15V (Note 1) |
| 10 | DYNAMIC | $g_{fs}$ Common-Source Forward Transcond. | | | 300 | | | 300 | | mmhos | $V_{DS}$ = 25V, $I_D$ = 0.5A f = 1KHz (Note 1) |
| 11 | DYNAMIC | $c_{iss}$ Common-Source Input Capacitance | | | 80 | | | 80 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |
| 12 | DYNAMIC | $c_{rss}$ Common-Source Reverse Transfer Capacitance | | | 1.3 | | | 1.3 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |
| 13 | DYNAMIC | $c_{oss}$ Common-Source Output Capacitance | | | 10.5 | | | 10.5 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |

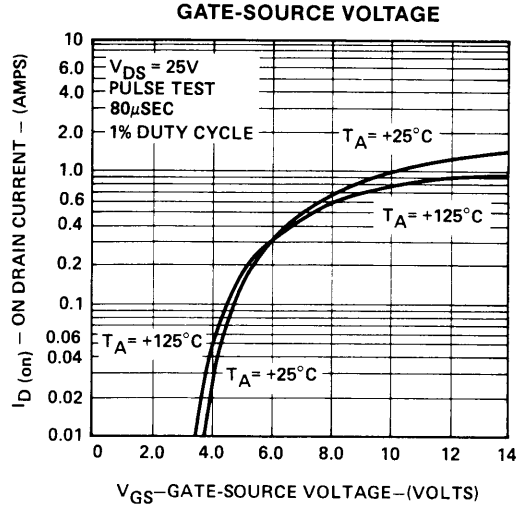
**Note 1:** Pulse Test 80μSec, 1% Duty Cycle

## TYPICAL PERFORMANCE CHARACTERISTICS ($T_A$ = +25°C unless otherwise specified)

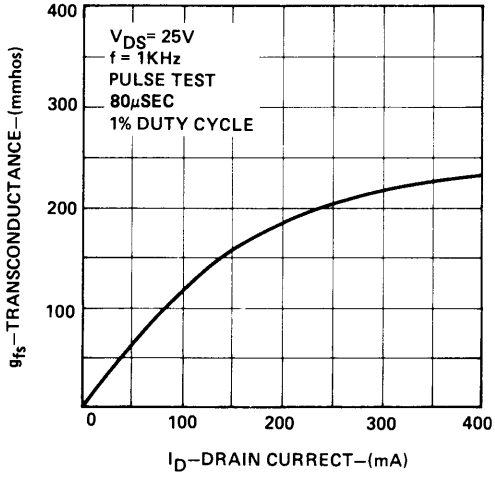
DRAIN-SOURCE ON RESISTANCE
—vs—
GATE-SOURCE VOLTAGE




ON DRAIN CURRENT
—vs—
GATE-SOURCE VOLTAGE




FORWARD TRANSCONDUCTANCE
—vs—
ON DRAIN CURRENT



TOPAZ SEMICONDUCTOR

# SD1104, SD1105, SD1114, SD1115

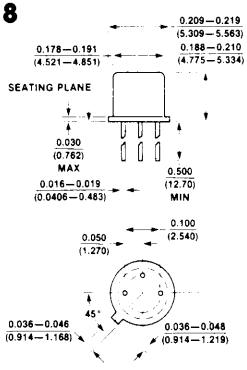
# N-CHANNEL ENHANCEMENT-MODE D-MOS POWER FETs

## ORDERING INFORMATION

| Sorted Chips in Carriers | SD1104CHP | SD1105CHP | SD1114CHP | SD1115CHP |
|---|---|---|---|---|
| TO-18 Package | SD1104DD | SD1105DD | SD1114DD | SD1115DD |
| TO-39 Package | SD1104HD | SD1105HD | SD1114HD | SD1115HD |
| TO-92 Package | SD1104BD | SD1105BD | SD1114BD | SD1115BD |
| Description | 100V, 3.0 ohms | 100V, 4.0 ohms | 80V, 3.0 ohms | 80V, 4.0 ohms |

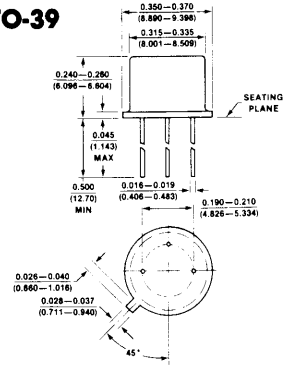
## PACKAGE DIMENSIONS

### TO-18



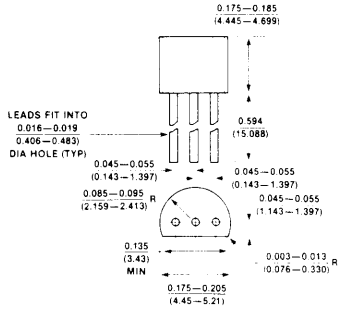

All dimensions in inches and (millimeters)

### TO-39



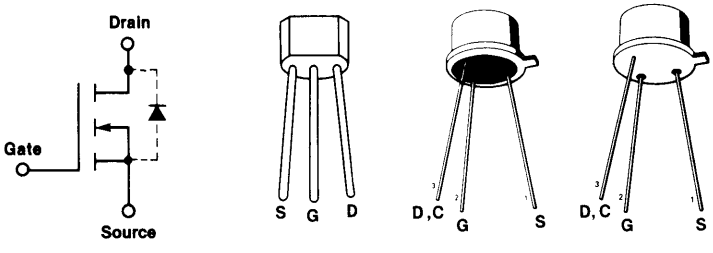

All dimensions in inches and (millimeters)

### TO-92

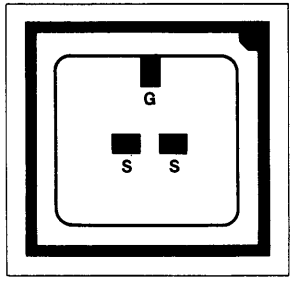



All dimensions in inches and (millimeters)

## SCHEMATIC DIAGRAM/PACKAGES




## CHIP CONFIGURATION




Dimensions: .054 x .056 x .013 inches
Drain is backside contact.

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## ABSOLUTE MAXIMUM RATINGS ($T_A$ = +25°C unless otherwise noted)

Drain-Source Voltage
- SD1104, SD1105 ..... 100V
- SD1114, SD1115 ..... 80V

Drain-Gate Voltage ($V_{GS}$ = 0)
- SD1104, SD1105 ..... 100V
- SD1114, SD1115 ..... 80V

Gate-Source Voltage ..... ±30V

Continuous Drain Current

| | $T_A$ = 25°C | $T_C$ = 25°C |
|---|---|---|
| SD1104BD, SD1114BD | .23 | .42A |
| SD1105BD, SD1115BD | .20 | .36A |
| SD1104DD, SD1114DD | .25 | .56A |
| SD1105DD, SD1115DD | .22 | .49A |
| SD1104HD, SD1114HD | .42 | 1.05A |
| SD1105HD, SD1115HD | .36 | .91A |

Peak Pulsed Drain Current ..... 2.0A

Continuous Device Dissipation

| | $T_A$ = +25°C | $T_C$ = +25°C | |
|---|---|---|---|
| SD1104/1105/1114/1115BD | 0.30 | 1.0 | W |
| SD1104/1105/1114/1115DD | 0.36 | 1.8 | W |
| SD1104/1105/1114/1115HD | 1.0 | 6.25 | W |

Linear Derating Factor

| | $T_A$ = + 25°C | $T_C$ = +25°C | |
|---|---|---|---|
| SD1104/1105/1114/1115BD | 2.4 | 8.0 | mW/°C |
| SD1104/1105/1114/1115DD | 2.0 | 14.4 | mW/°C |
| SD1104/1105/1114/1115HD | 8.0 | 50 | mW/°C |

Operating Junction Temperature Range ..... −55 to +150°C

Storage Temperature Range ..... −55 to +150°C

Lead Temperature (1/16" from mounting surface for 30 Sec) ..... +260°C

## ELECTRICAL CHARACTERISTICS ($T_A$ = +25°C unless otherwise noted)

| # | | CHARACTERISTIC | | SD1104, SD1105 MIN | SD1104, SD1105 TYP | SD1104, SD1105 MAX | SD1114, SD1115 MIN | SD1114, SD1115 TYP | SD1114, SD1115 MAX | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | STATIC | $BV_{DSS}$ Drain-Source Breakdown Voltage | | 100 | | | 80 | | | V | $I_D$ = 100μA, $V_{GS}$ = 0 |
| 2 | | $V_{GS(th)}$ Gate-Source Threshold Voltage | | 1.0 | 2.4 | 5.0 | 1.0 | 2.4 | 5.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 1mA |
| 3 | | $I_{GBS}$ Gate-Body Leakage Current | | | .03 | 1.0 | | .03 | 1.0 | nA | $V_{GS}$ = 20V, $V_{DS}$ = 0 |
| 4 | | Drain-Source OFF | | | 0.1 | 10 | | | | μA | $V_{DS}$ = 80V, $V_{GS}$ = 0 |
| 5 | | $I_{DSS}$ Leakage Current | | | | | | 0.1 | 10 | μA | $V_{DS}$ = 64V, $V_{GS}$ = 0 |
| 6 | | $I_{D(on)}$ ON Drain Current | | 2.0 | | | 2.0 | | | A | $V_{DS}$ = 25V, $V_{GS}$ = 15V (Note 1) |
| 7 | | $r_{DS(on)}$ Static Drain-Source ON Resistance | SD1104 | | | 3.0 | | | | ohms | $I_D$ = 100mA, $V_{GS}$ = 15V (Note 1) |
| 8 | | | SD1105 | | | 4.0 | | | | ohms | |
| 9 | | | SD1114 | | | | | | 3.0 | ohms | |
| 10 | | | SD1115 | | | | | | 4.0 | ohms | |
| 11 | DYNAMIC | $g_{fs}$ Common-Source Forward Transcond. | | | 500 | | | 500 | | mmhos | $V_{DS}$ = 25V, $I_D$ = 1.0A f = 1KHz (Note 1) |
| 12 | | $c_{iss}$ Common-Source Input Capacitance | | | 80 | | | 80 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |
| 13 | | $c_{rss}$ Common-Source Reverse Transfer Capacitance | | | 1.3 | | | 1.3 | | pF | |
| 14 | | $c_{oss}$ Common-Source Output Capacitance | | | 10.5 | | | 10.5 | | pF | |
| 15 | | $t_{on}$ Turn-On Time | | | 4.0 | | | 4.0 | | nSec | $V_{DD}$ = 25V, $R_L$ = 20 ohms, $R_G$ = 50 ohms, $V_{GS}$ = 10 V |
| 16 | | $t_{off}$ Turn-off Time | | | 4.0 | | | 4.0 | | nSec | |

**Note 1:** Pulse Test 80μSec, 1% Duty Cycle

TOPAZ SEMICONDUCTOR

# SD1106

# N-CHANNEL ENHANCEMENT-MODE D-MOS POWER FETs

## FEATURES

- Inherent Current Sharing Capability when Paralleled
- Simple Straight-Forward DC Biasing
- Extended Safe Operating Area
- Inherently Temperature Stable—
  Output Current Decreases as Temperature Increases

## APPLICATIONS

- High-Speed Pulse Amplifiers
- Logic Buffers
- Line Drivers
- Solid-State Relays

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = +25°C unless otherwise noted)

| | |
|---|---|
| Drain-Source Voltage | 60V |
| Drain-Gate Voltage ($V_{GS}$ = 0) | 60V |
| Gate-Source Voltage | ±30V |
| Continuous Drain Current (Note 1, Note 2) | 0.5A |
| Peak Drain Current (Note 1, Note 2) | 2.0A |
| Continuous Device Dissipation (Note 1, Note 2) | 1.8W |
| Linear Derating Factor (Note 1, Note 2) | 14.4mW/°C |
| Operating Junction Temperature Range | -55 to +150°C |
| Storage Temperature Range | -55 to +150°C |
| Lead Temperature (1/16" from mounting surface for 30 Sec) | +260°C |

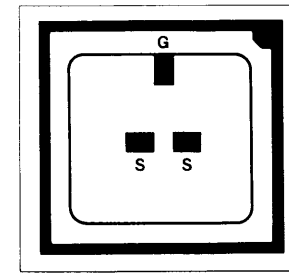
**Note 1:** $T_{Case}$ = +25°C

**Note 2:** Not applicable to chips. Final value depends upon mounting substrate.

## ORDERING INFORMATION

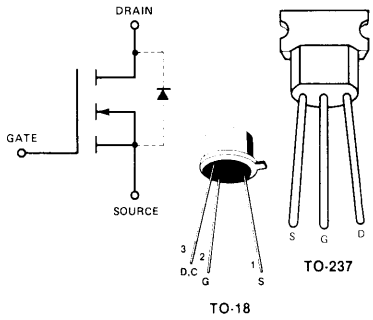
| | |
|---|---|
| Sorted Chips in Carriers | SD1106CHP |
| TO-18 Package | SD1106DD |
| TO-237 Package | SD1106AD |

## CHIP CONFIGURATION




**Dimensions: .054 x .056 x .013 inches**
**Drain is backside contact.**

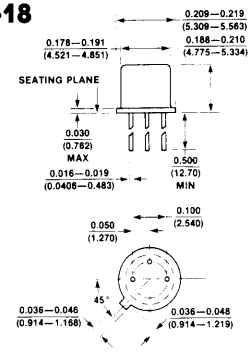
## SCHEMATIC DIAGRAM




Drain common to Case or Tab.

## PACKAGE DIMENSIONS

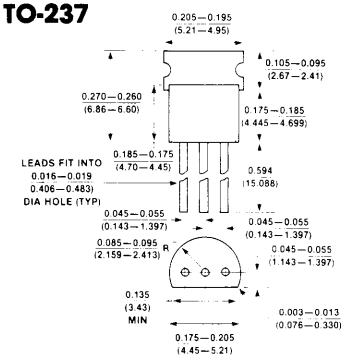
### TO-18




All dimensions in inches and (millimeters)

## PACKAGE DIMENSIONS

### TO-237



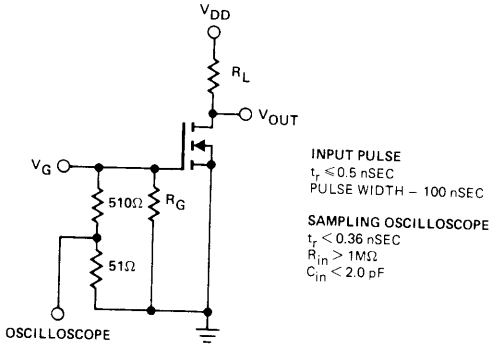

All dimensions in inches and (millimeters)

## ELECTRICAL CHARACTERISTICS ($T_A$ = +25°C unless otherwise noted)

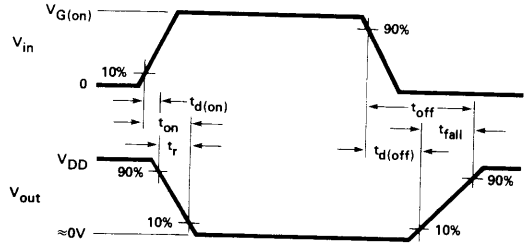
| # | | CHARACTERISTIC | | SD1106 MIN | SD1106 TYP | SD1106 MAX | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|---|---|
| 1 | STATIC | $BV_{DSS}$ | Drain-Source Breakdown Voltage | 60 | | | V | $I_D$ = 100μA, $V_{GS}$ = 0 |
| 2 | STATIC | $V_{GS(th)}$ | Gate-Source Threshold Voltage | 0.8 | | 2.5 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 1mA |
| 3 | STATIC | $I_{GBS}$ | Gate-Body Leakage Current | | .03 | 10 | nA | $V_{GS}$ = 20V, $V_{DS}$ = 0 |
| 4 | STATIC | $I_{DSS}$ | Drain-Source OFF Leakage Current | | .01 | 10 | μA | $V_{DS}$ = 40V, $V_{GS}$ = 0 |
| 5 | STATIC | $I_{D(on)}$ | ON Drain Current | 0.25 | | | A | $V_{DS}$ = 25V (Note 1) — $V_{GS}$ = 5V |
| 6 | STATIC | | | 0.50 | | | | $V_{GS}$ = 10V |
| 7 | STATIC | $V_{DS(on)}$ | Drain-Source ON Voltage | | 1.8 | 2.5 | V | $V_{GS}$ = 10V, $I_D$ = 0.5A (Note 1) |
| 8 | DYNAMIC | $g_{fs}$ | Common-Source Forward Transcond. | 100 | 270 | | mmhos | $V_{DS}$ = 15V, $I_D$ = 0.5A f = 1KHz (Note 1) |
| 9 | DYNAMIC | $C_{iss}$ | Common-Source Input Capacitance | | 80 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |
| 10 | DYNAMIC | $C_{rss}$ | Common-Source Reverse Transfer Capacitance | | 1.3 | | | |
| 11 | DYNAMIC | $C_{oss}$ | Common-Source Output Capacitance | | 10.5 | | | |
| 12 | DYNAMIC | $t_{on}$ | Turn-On Time | | 4.0 | 6.0 | nSec | $V_{DD}$ = 25V $R_L$ = 25 ohms $R_G$ = 51 ohms $V_{G(on)}$ = 10V |
| 13 | DYNAMIC | $t_{off}$ | Turn-Off Time | | 4.0 | 6.0 | | |

**Note 1:** Pulse Test 80μSec, 1% Duty Cycle

## SWITCHING TIMES TEST CIRCUIT




## TEST WAVEFORMS



TOPAZ SEMICONDUCTOR

# SD1107, SD1117

# N-CHANNEL ENHANCEMENT-MODE D-MOS POWER FETs

## FEATURES

- Inherent Current Sharing Capability when Paralleled
- Simple Straight-Forward DC Biasing
- Extended Safe Operating Area
- Inherently Temperature Stable — Output Current Decreases as Temperature Increases

## APPLICATIONS

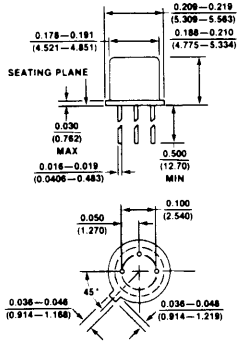
- High-Speed Pulse Amplifiers
- CMOS Logic to High-Current Interfaces
- High-Speed Switching
- Line Drivers

## ORDERING INFORMATION

| Sorted Chips in Carriers | SD1107CHP | SD1117CHP |
|---|---|---|
| TO-18 Package | SD1107DD | SD1117DD |
| TO-39 Package | SD1107HD | SD1117HD |
| TO-92 Package | SD1107BD | SD1117BD |
| Description | 100V, 4.0 ohm | 60V, 2.5 ohm |

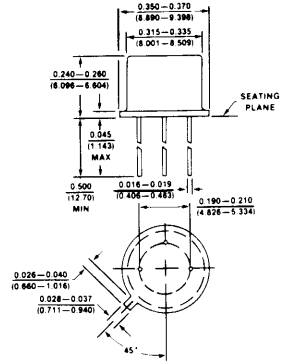
## PACKAGE DIMENSIONS

### TO-18



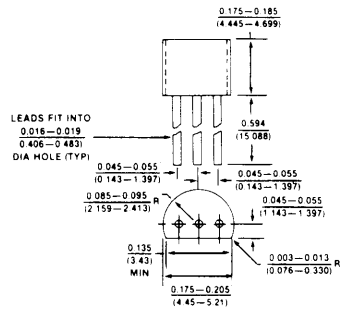

All dimensions in inches and (millimeters)

### TO-39



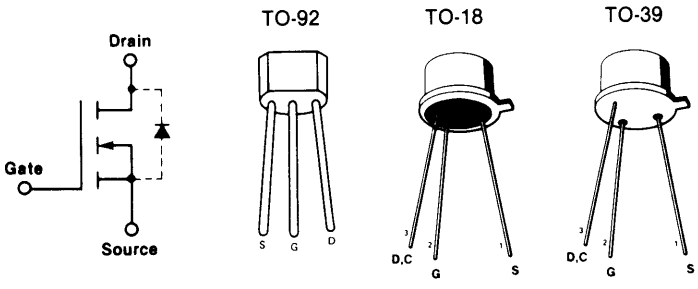

All dimensions in inches and (millimeters)

### TO-92

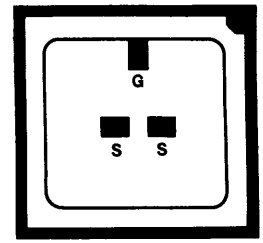



All dimensions in inches and (millimeters)

## SCHEMATIC DIAGRAM/PACKAGES




## CHIP CONFIGURATION




Dimensions: .054 x .056 x .013 inches
Drain is backside contact.

**Topaz Semiconductor,** 1971 N. Capitol Avenue, San Jose, CA 95132-3799, 408/942-9100 TWX: 910-338-0025

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = +25°C unless otherwise noted)

Drain-Source Voltage
- SD1107 ..... 100V
- SD1117 ..... 60V

Drain-Gate Voltage ($V_{GS}$ = 0)
- SD1107 ..... 100V
- SD1117 ..... 60V

Gate-Source Voltage ..... ±30V

Continous Drain Current

| | $T_A$ = 25°C | $T_C$ = 25°C | |
|---|---|---|---|
| SD1107BD | .20 | .36 | A |
| SD1107DD | .22 | .49 | A |
| SD1107HD | .36 | .91 | A |
| SD1117BD | .25 | .46 | A |
| SD1117DD | .28 | .62 | A |
| SD1117HD | .46 | 1.15 | A |

Peak Pulsed Drain Current ..... 2.0A

Continuous Device Dissipation

| | $T_A$ = +25°C | $T_C$ = +25°C | |
|---|---|---|---|
| SD1107BD, SD1117BD | 0.30 | 1.0 | W |
| SD1107DD, SD1117DD | 0.36 | 1.8 | W |
| SD1107HD, SD1117HD | 1.0 | 6.25 | W |

Linear Derating Factor

| | $T_A$ = +25°C | $T_C$ = +25°C | |
|---|---|---|---|
| SD1107BD, SD1117BD | 2.4 | 8.0 | mW/°C |
| SD1107DD, SD1117DD | 2.9 | 14.4 | mW/°C |
| SD1107HD, SD1117HD | 8.0 | 50 | mW/°C |

Operating Junction Temperature Range ..... −55 to +150°C

Storage Temperature Range ..... −55 to +150°C

Lead Temperature (1/16" from mounting surface for 30 Sec) ..... +260°C

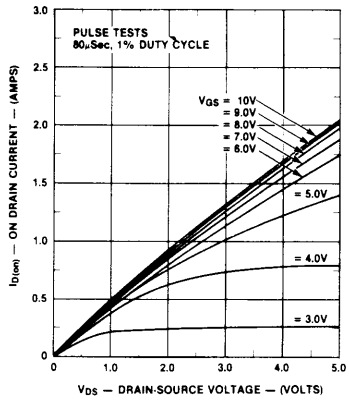
## ELECTRICAL CHARACTERISTICS ($T_A$ = +25°C unless otherwise noted)

| # | | CHARACTERISTIC | | SD1107 MIN | SD1107 TYP | SD1107 MAX | SD1117 MIN | SD1117 TYP | SD1117 MAX | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | STATIC | $BV_{DSS}$ | Drain-Source Breakdown Voltage | 100 | 140 | | 60 | 90 | | V | $I_D$ = 10μA, $V_{GS}$ = 0 |
| 2 | | $V_{GS(th)}$ | Gate-Source Threshold Voltage | 0.8 | | 2.0 | 0.8 | | 2.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 1mA |
| 3 | | $I_{GBS}$ | Gate-Body Leakage Current | | .03 | 1.0 | | .03 | 1.0 | nA | $V_{GS}$ = 20V, $V_{DS}$ = 0 |
| 4 | | | | | | 10 | | | 10 | | $T_A$ = +125°C |
| 5 | | $I_{DSS}$ | Drain-Source OFF Leakage Current | | 0.1 | 1.0 | | | | μA | $V_{DS}$ = 80V, $V_{GS}$ = 0 |
| 6 | | | | | | 50 | | | | | $T_A$ = +125°C |
| 7 | | | | | | | | 0.1 | 1.0 | | $V_{DS}$ = 48V, $V_{GS}$ = 0 |
| 8 | | | | | | | | | 50 | | $T_A$ = +125°C |
| 9 | | $I_{D(on)}$ | ON Drain Current | 2.0 | 3.0 | | 2.0 | 3.5 | | A | $V_{DS}$ = 25V, $V_{GS}$ = 10V (Note 1) |
| 10 | | $r_{DS(on)}$ | Drain-Source ON Resistance | | 3.2 | 5.0 | | 2.3 | 4.5 | ohms | $V_{GS}$ = 5V, $I_D$ = 0.3A (Note 1) |
| 11 | | | | | 2.9 | 4.0 | | 2.0 | 2.5 | | $V_{GS}$ = 10V, $I_D$ = 1.0A (Note 1) |
| 12 | DYNAMIC | $g_{fs}$ | Common-Source Forward Transcond. | | 500 | | | 500 | | mmhos | $V_{DS}$ = 25V, $I_D$ = 1.0A f = 1KHz (Note 1) |
| 13 | | $c_{iss}$ | Common-Source Input Capacitance | | 80 | | | 80 | | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0 f = 1MHz |
| 14 | | $c_{rss}$ | Common-Source Reverse Transfer Capacitance | | 1.3 | | | 1.3 | | | |
| 15 | | $c_{oss}$ | Common-Source Output Capacitance | | 10.5 | | | 10.5 | | | |
| 16 | | $t_{on}$ | Turn-On Time | | 4.0 | 6.0 | | 4.0 | 6.0 | nSec | $V_{DD}$ = 25V, $R_L$ = 25 ohms, $R_G$ = 51 ohms, $V_{G(on)}$ = 10V |
| 17 | | $t_{off}$ | Turn-Off Time | | 4.0 | 6.0 | | 4.0 | 6.0 | | |

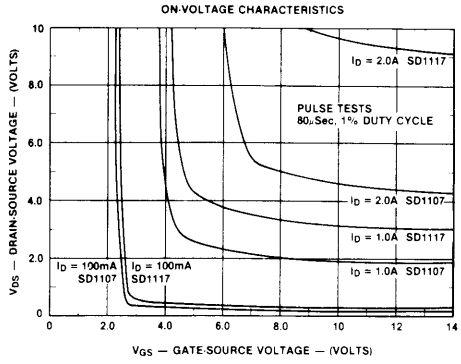
**Note 1:** Pulse Test 80μSec, 1% Duty Cycle

## TYPICAL PERFORMANCE CHARACTERISTICS ($T_A$ = +25°C unless otherwise noted)

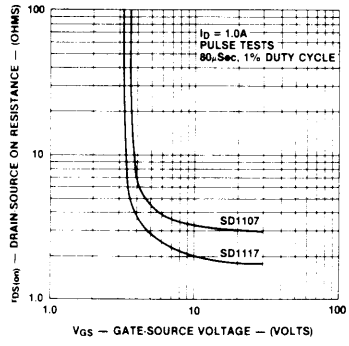
SATURATION CHARACTERISTICS
SD1117



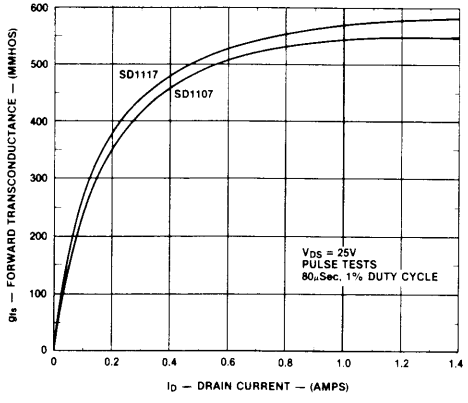

ON-VOLTAGE CHARACTERISTICS



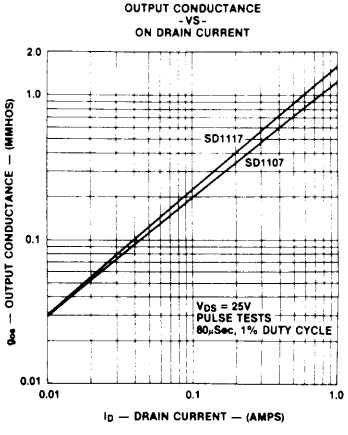

DRAIN-SOURCE ON RESISTANCE
-VS-
GATE-SOURCE VOLTAGE




FORWARD TRANSCONDUCTANCE
-VS-
ON DRAIN CURRENT




OUTPUT CONDUCTANCE
-VS-
ON DRAIN CURRENT




TRANSFER CHARACTERISTICS