
2SK1159, 2SK1160

Silicon N-Channel MOS FET

HITACHI

Application

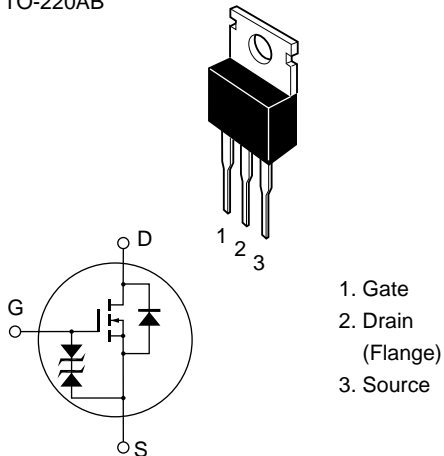
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter and motor driver

Outline

TO-220AB



2SK1159, 2SK1160

Absolute Maximum Ratings (Ta = 25°C)

| Item | | Symbol | Ratings | Unit |
|---|---------|---------------------|-------------|------|
| Drain to source voltage | 2SK1159 | V_{DSS} | 450 | V |
| | 2SK1160 | | 500 | |
| Gate to source voltage | | V_{GSS} | ±30 | V |
| Drain current | | I_D | 8 | A |
| Drain peak current | | $I_{D(pulse)}^{*1}$ | 32 | A |
| Body to drain diode reverse drain current | | I_{DR} | 8 | A |
| Channel dissipation | | P_{ch}^{*2} | 60 | W |
| Channel temperature | | Tch | 150 | °C |
| Storage temperature | | Tstg | -55 to +150 | °C |

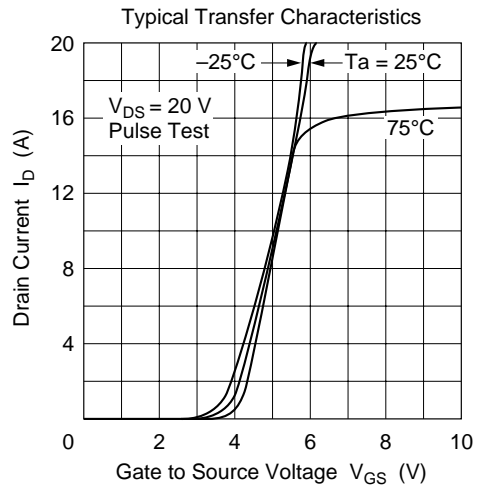
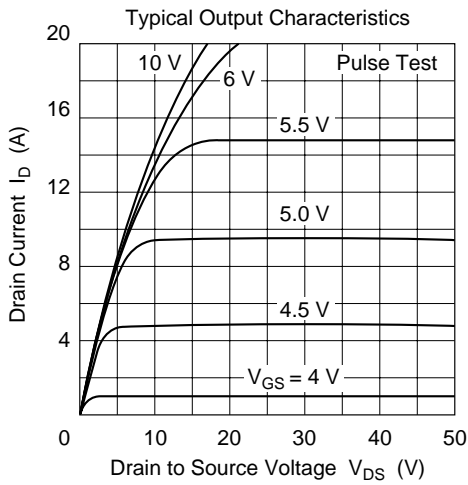
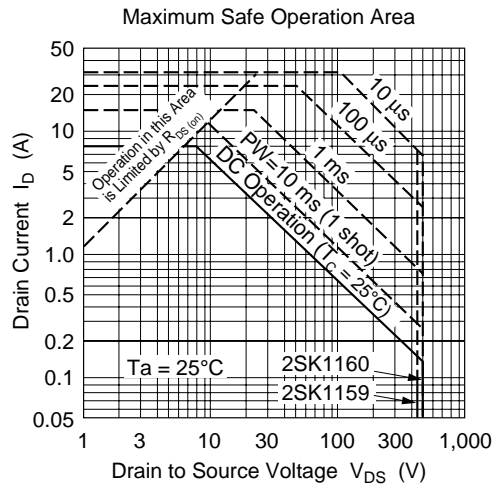
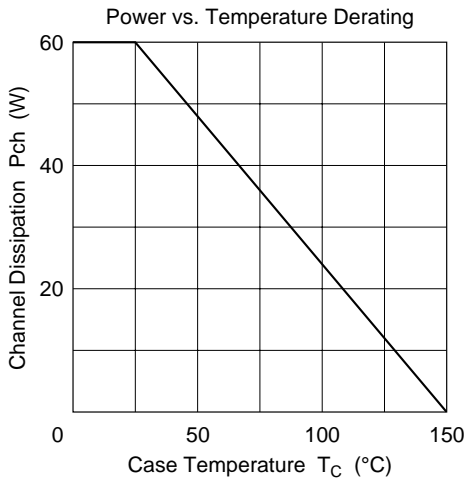
Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

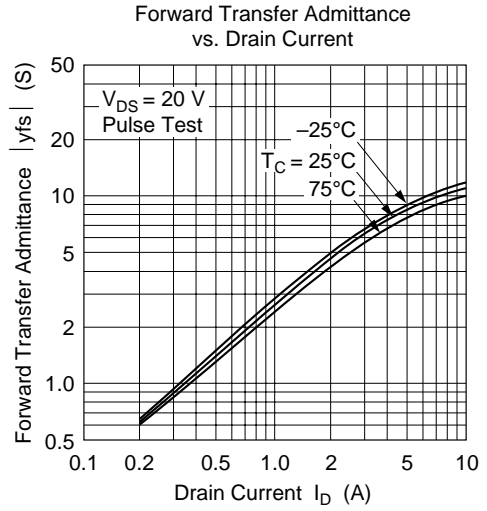
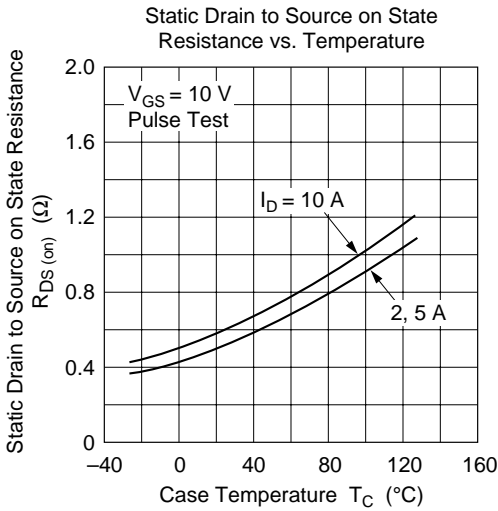
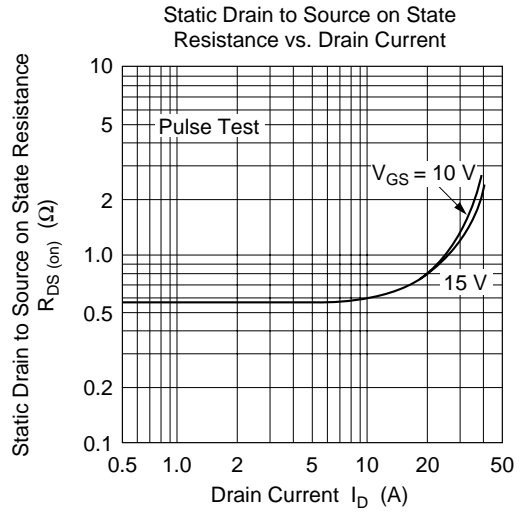
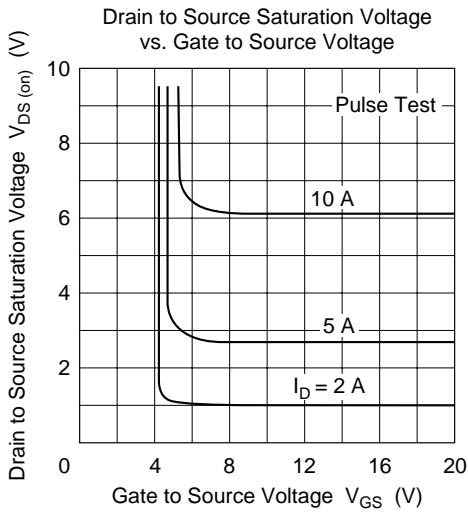
2. Value at $T_c = 25^\circ C$

Electrical Characteristics (Ta = 25°C)

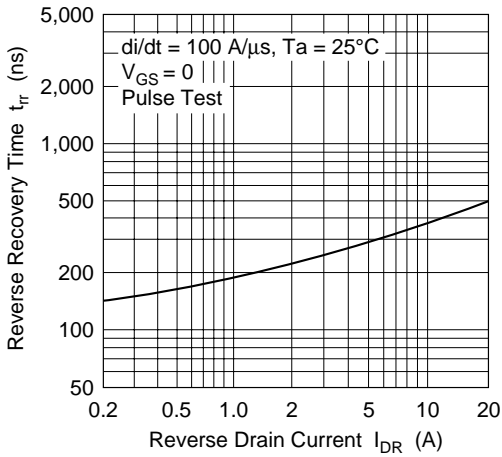
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|----------------------------------|------------|--------------|------------|------|--|
| Drain to source breakdown voltage | 2SK1159 $V_{(BR)DSS}$ 2SK1160 | 450 500 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ±30 | — | — | V | $I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ±10 | μA | $V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0$ |
| Zero gate voltage drain current | 2SK1159 I_{DSS} 2SK1160 | — | — | 250 | μA | $V_{DS} = 360 \text{ V}$, $V_{GS} = 0$ $V_{DS} = 400 \text{ V}$, $V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 2.0 | — | 3.0 | V | $I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ |
| Static Drain to source on state resistance | 2SK1159 $R_{DS(on)}$ 2SK1160 | — — | 0.55 0.60 | 0.7 0.8 | Ω | $I_D = 4 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$ |
| Forward transfer admittance | yfs | 4.5 | 7.5 | — | S | $I_D = 4 \text{ A}$, $V_{DS} = 10 \text{ V}^{*1}$ |
| Input capacitance | Ciss | — | 1150 | — | pF | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, |
| Output capacitance | Coss | — | 340 | — | pF | f = 1 MHz |
| Reverse transfer capacitance | Crss | — | 55 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 17 | — | ns | $I_D = 4 \text{ A}$, $V_{GS} = 10 \text{ V}$, |
| Rise time | t_r | — | 55 | — | ns | $R_L = 7.5 \text{ } \Omega$ |
| Turn-off delay time | $t_{d(off)}$ | — | 100 | — | ns | |
| Fall time | t_f | — | 45 | — | ns | |
| Body to drain diode forward voltage | V_{DF} | — | 0.9 | — | V | $I_F = 8 \text{ A}$, $V_{GS} = 0$ |
| Body to drain diode forward voltage | t_{rr} | — | 350 | — | ns | $I_F = 8 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu\text{s}$ |

Note: 1. Pulse test

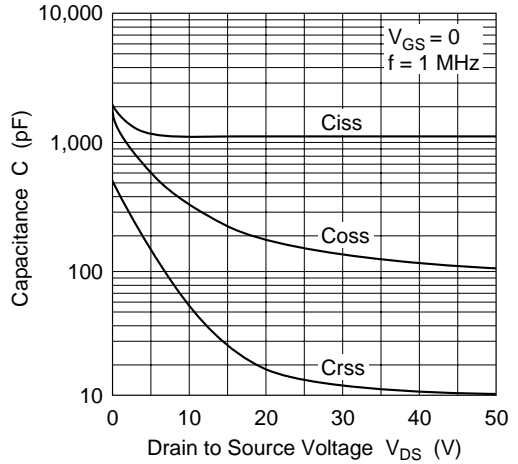




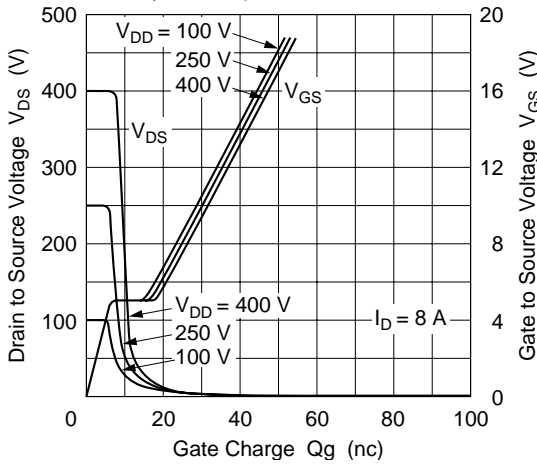
Body to Drain Diode Reverse Recovery Time



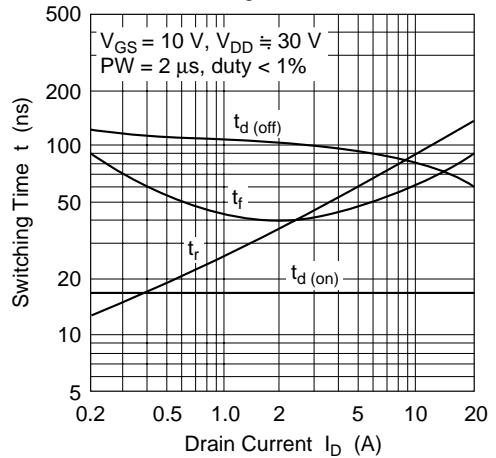
Typical Capacitance vs. Drain to Source Voltage

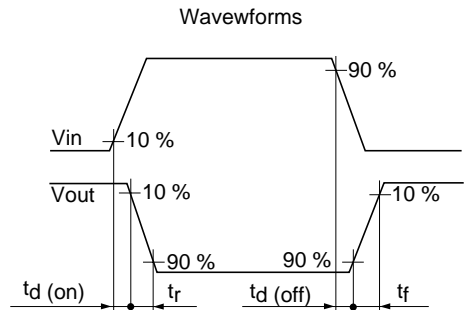
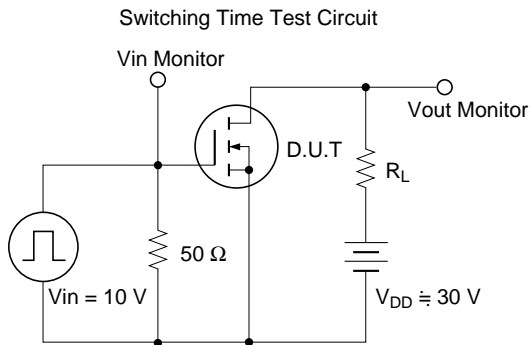
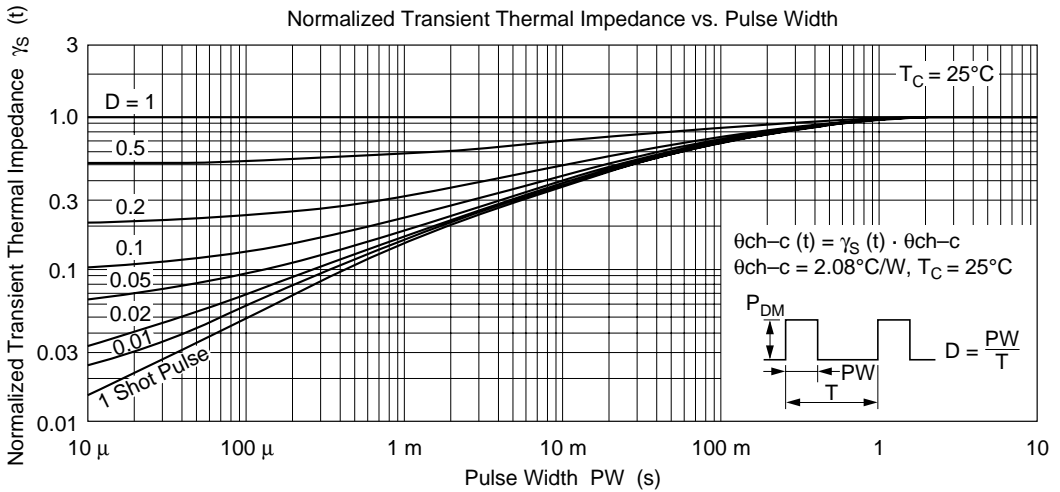
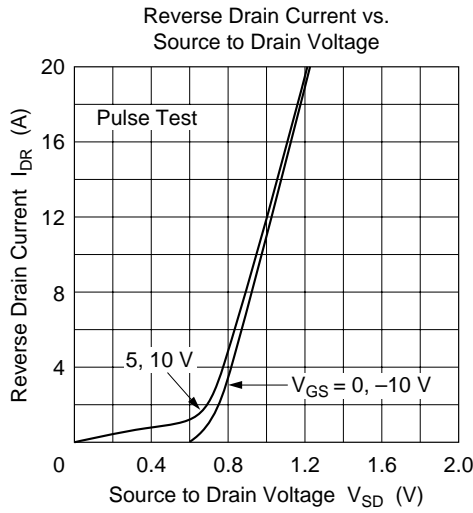


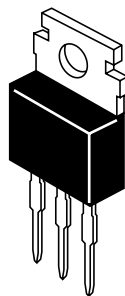
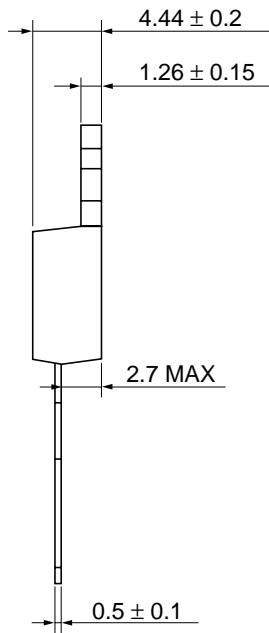
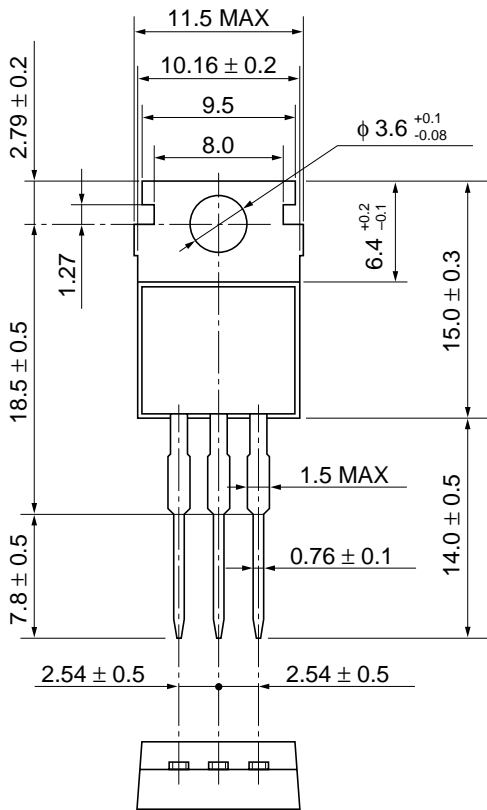
Dynamic Input Characteristics



Switching Characteristics







| | |
|--------------------------|----------|
| Hitachi Code | TO-220AB |
| JEDEC | Conforms |
| EIAJ | Conforms |
| Weight (reference value) | 1.8 g |

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