Ordering number:ENN4689

N-Channel Silicon MOSFET

# 2SK2154

## Ultrahigh-Speed Switching Applications

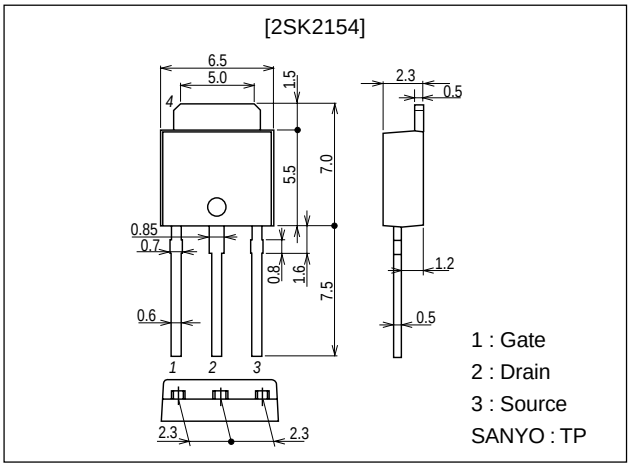
## Features

- Low ON resistance.
- Ultrahigh-speed switching.
- Low-voltage drive.

## Package Dimensions

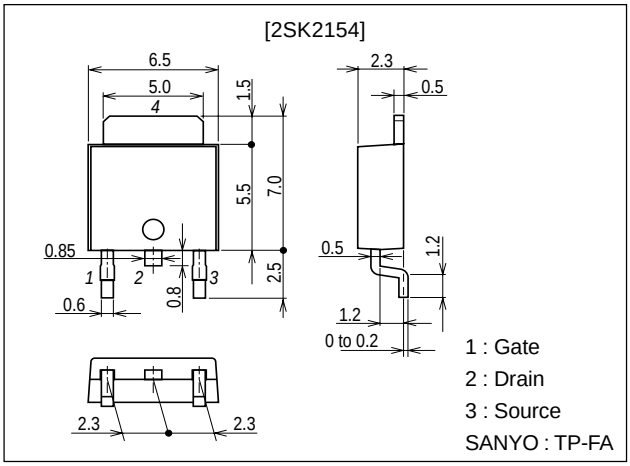
unit:mm

2083B




unit:mm

2092B







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TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

# Specifications

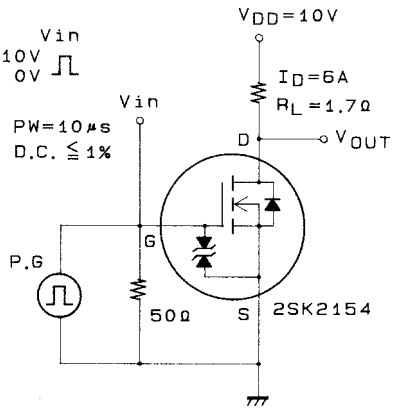
## Absolute Maximum Ratings at Ta = 25˚C

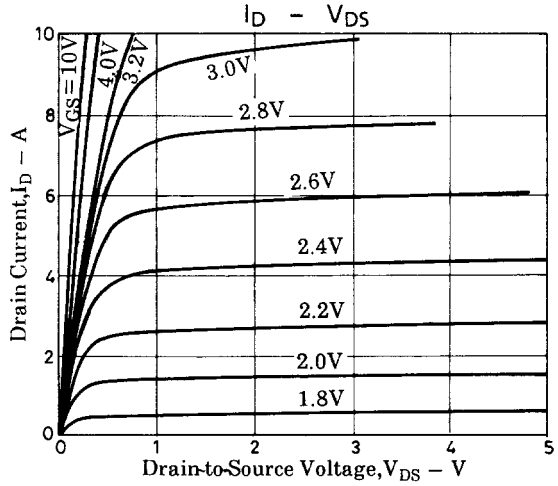
| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | | 20 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±18 | V |
| Drain Current (DC) | $I_D$ | | 12 | A |
| Drain Current (pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 48 | A |
| Allowable Power Dissipation | $P_D$ | Tc=25°C | 30 | W |
| Channel Temperature | Tch | | 150 | ˚C |
| Storage Temperature | Tstg | | –55 to +150 | ˚C |

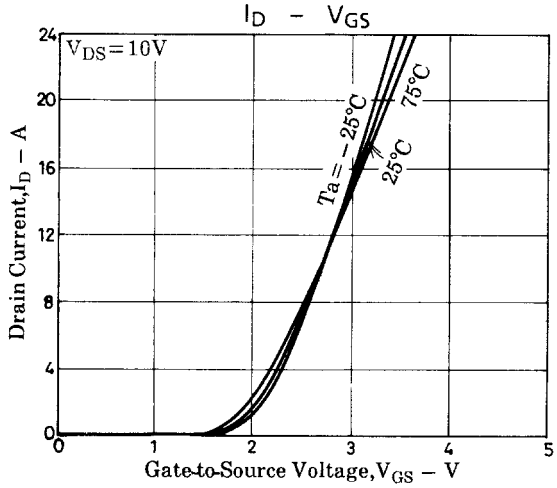
## Electrical Characteristics at Ta = 25˚C

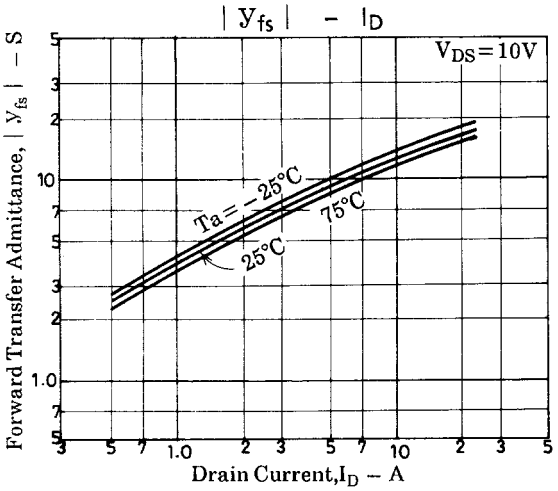
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$=1mA, $V_{GS}$=0 | 20 | | | V |
| Gate-to-Source Breakdown Voltage | $V_{(BR)GSS}$ | $I_G$=±100μA, $V_{DS}$=0 | ±18 | | | V |
| Zero-Gate Votlage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0 | | | 100 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V, $V_{DS}$=0 | | | ±10 | μA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}$=10V, $I_D$=1mA | 0.8 | | 2.0 | V |
| Forward Transfer Admittance | \| yfs \| | $V_{DS}$=10V, $I_D$=6A | 7 | 10 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)}1$ | $I_D$=6A, $V_{GS}$=10V | | 30 | 42 | mΩ |
| | $R_{DS(on)}2$ | $I_D$=6A, $V_{GS}$=4V | | 45 | 58 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=10V, f=1MHz | | 1000 | | pF |
| Output Capacitance | Coss | $V_{DS}$=10V, f=1MHz | | 650 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=10V, f=1MHz | | 220 | | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit | | 13 | | ns |
| Rise Time | $t_r$ | See specified Test Circuit | | 35 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | See specified Test Circuit | | 180 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit | | 120 | | ns |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=8A, $V_{GS}$=0 | | 1.0 | 1.5 | V |
| Drain Current | $I_{DSX}$ | $V_{DS}$=5V, $V_{GS}$=0.1V | | | 0.5 | μA |

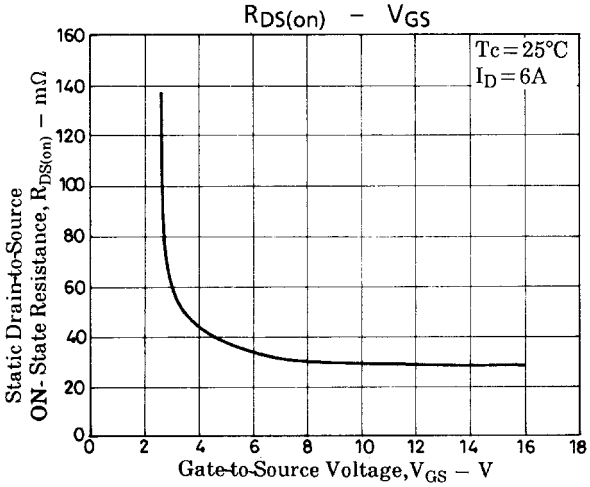
## Switching Time Test Circuit

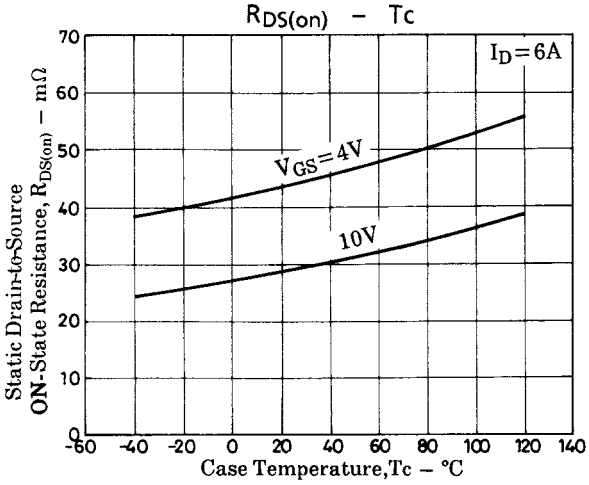


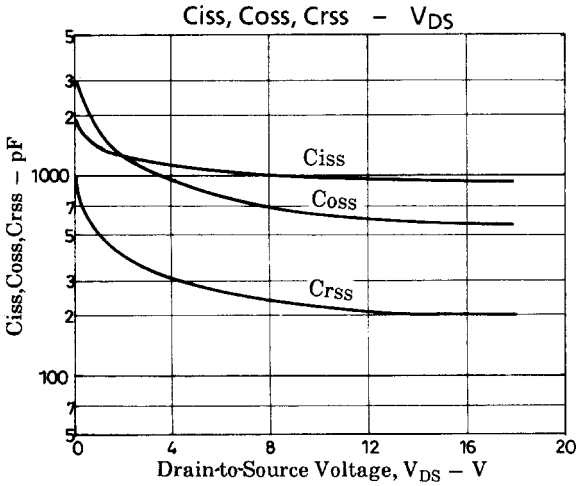

ID – VDS
Drain Current,ID – A
Drain-to-Source Voltage,VDS – V
VGS=10V
4.0V
3.2V
3.0V
2.8V
2.6V
2.4V
2.2V
2.0V
1.8V

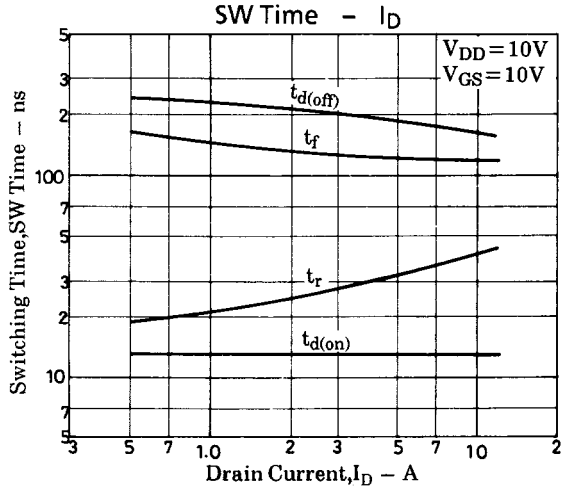

ID – VGS
VDS=10V
Drain Current,ID – A
Gate-to-Source Voltage,VGS – V
Ta=–25°C
25°C
75°C

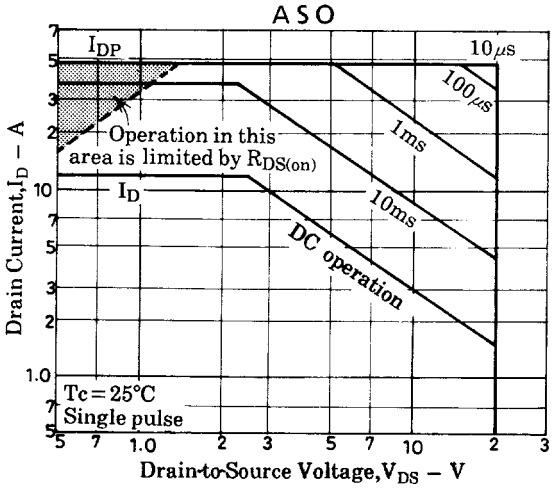

| yfs | – ID
VDS=10V
Forward Transfer Admittance, | yfs | – S
Drain Current,ID – A
Ta=–25°C
25°C
75°C


RDS(on) – VGS
Tc=25°C
ID=6A
Static Drain-to-Source
ON-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage,VGS – V


RDS(on) – Tc
ID=6A
VGS=4V
10V
Static Drain-to-Source
ON-State Resistance, RDS(on) – mΩ
Case Temperature,Tc – °C


Ciss, Coss, Crss – VDS
Ciss
Coss
Crss
Ciss,Coss,Crss – pF
Drain-to-Source Voltage, VDS – V


SW Time – ID
VDD=10V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time,SW Time – ns
Drain Current,ID – A


ASO
IDP
10μs
100μs
1ms
10ms
DC operation
Operation in this
area is limited by RDS(on)
ID
Tc=25°C
Single pulse
Drain Current,ID – A
Drain-to-Source Voltage,VDS – V