Ordering number:ENN4689

N-Channel Silicon MOSFET

2SK2154

Ultrahigh-Speed Switching Applications

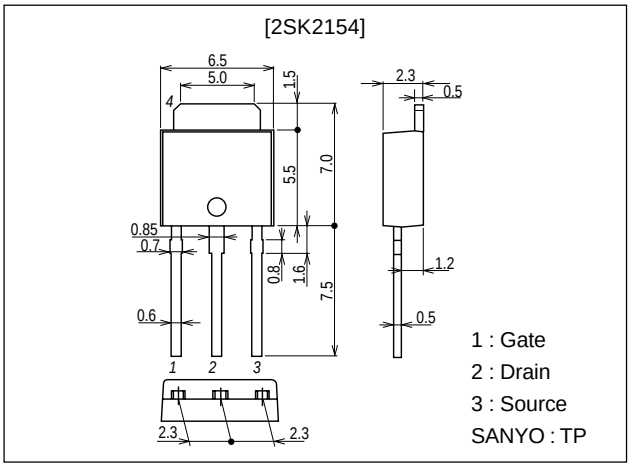
Features

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

Package Dimensions

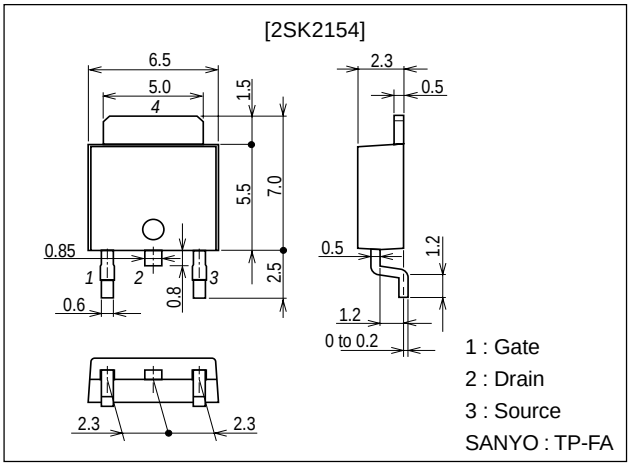
unit:mm

2083B



unit:mm

2092B



SANYO Electric Co.,Ltd. Semiconductor Company

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

Specifications

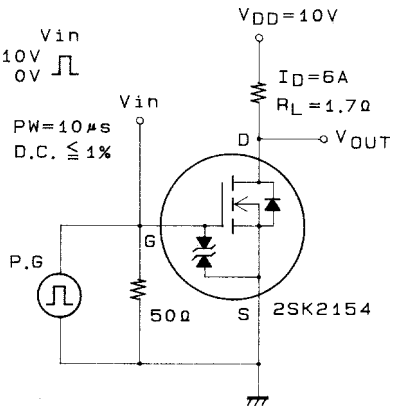
Absolute Maximum Ratings at Ta = 25˚C

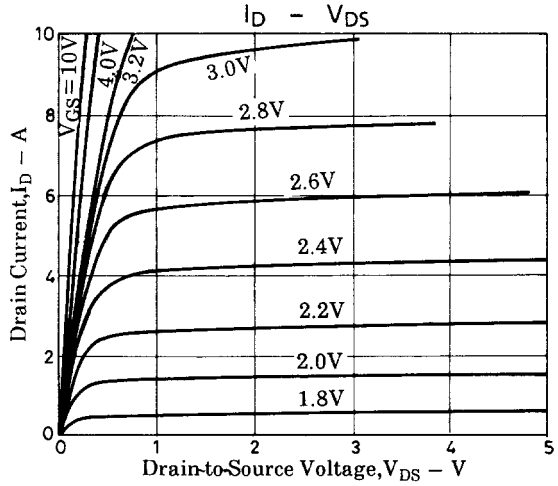
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		±18	V
Drain Current (DC)	I_D		12	A
Drain Current (pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	48	A
Allowable Power Dissipation	P_D	Tc=25°C	30	W
Channel Temperature	Tch		150	˚C
Storage Temperature	Tstg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

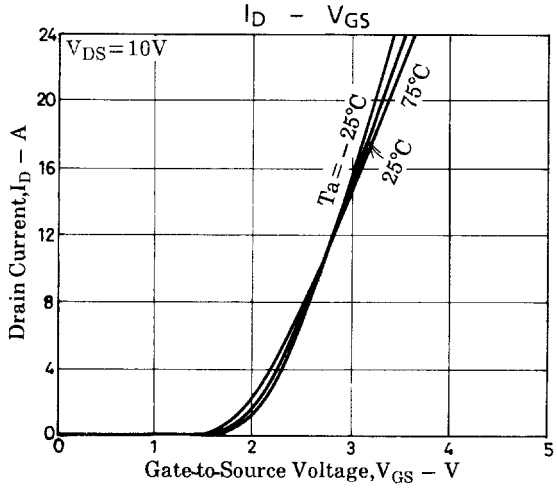
Electrical Characteristics at Ta = 25˚C

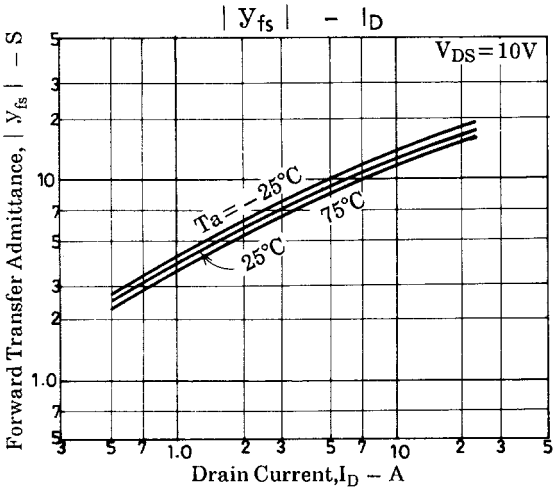
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0	20			V
Gate-to-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G=±100μA, V_{DS}=0	±18			V
Zero-Gate Votlage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0			100	μA
Gate-to-Source Leakage 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

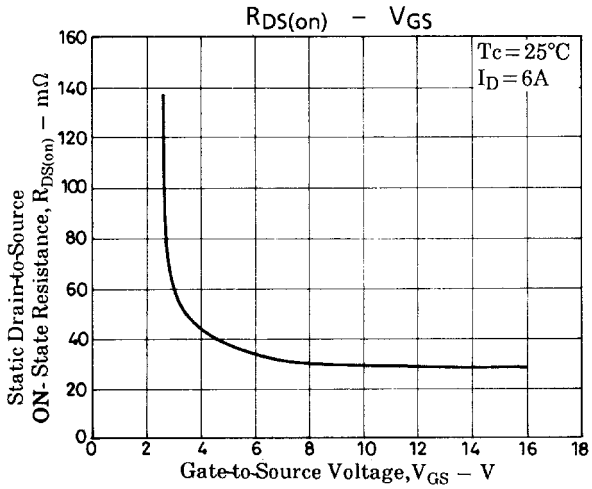
Switching Time Test Circuit

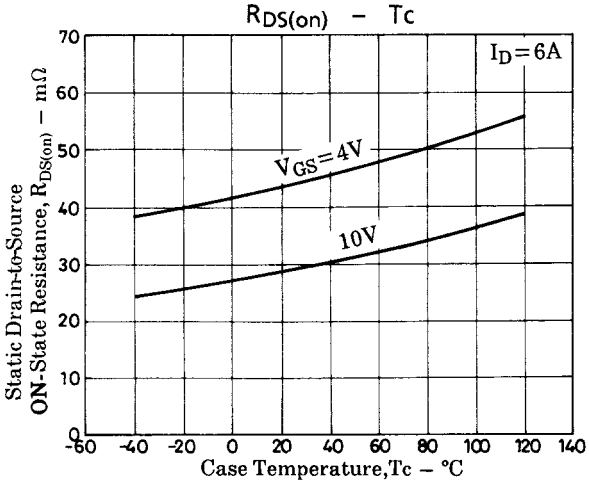


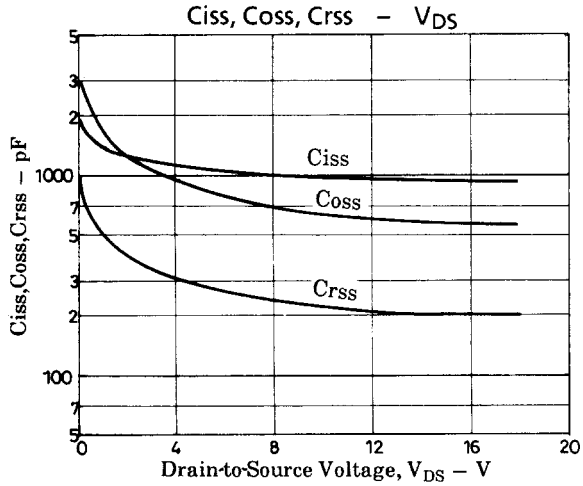

I_D – V_{DS}
Drain Current, I_D – A
Drain-to-Source Voltage, V_{DS} – V
V_{GS}=10V
4.0V
3.2V
3.0V
2.8V
2.6V
2.4V
2.2V
2.0V
1.8V

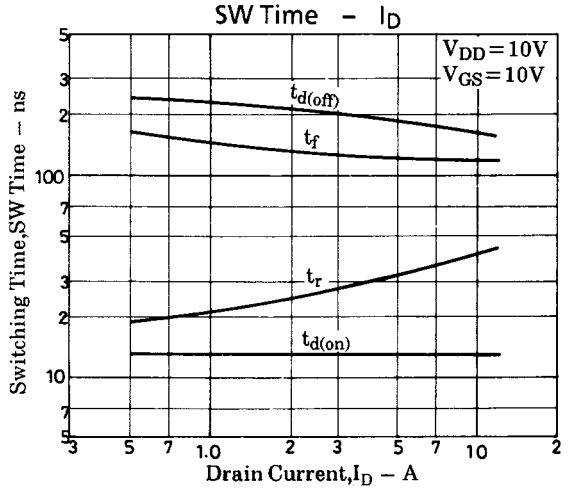

I_D – V_{GS}
V_{DS}=10V
Drain Current, I_D – A
Gate-to-Source Voltage, V_{GS} – V
Ta=–25°C
25°C
75°C

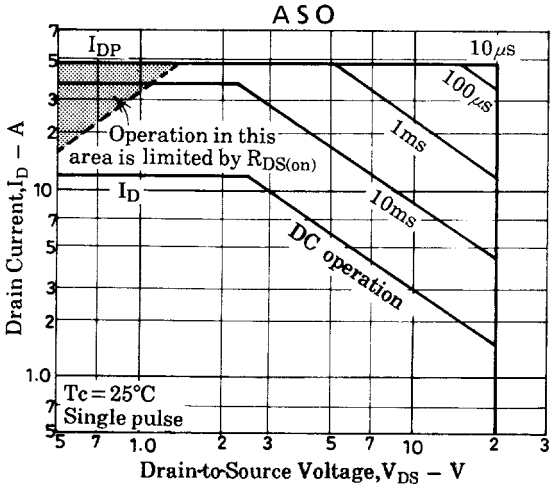

| y_{fs} | – I_D
V_{DS}=10V
Forward Transfer Admittance, | y_{fs} | – S
Drain Current, I_D – A
Ta=–25°C
25°C
75°C


$R_{DS(on)}$ – V_{GS}
Tc=25°C
I_D=6A
Static Drain-to-Source ON-State Resistance, $R_{DS(on)}$ – mΩ
Gate-to-Source Voltage, V_{GS} – V


$R_{DS(on)}$ – Tc
I_D=6A
V_{GS}=4V
10V
Static Drain-to-Source ON-State Resistance, $R_{DS(on)}$ – mΩ
Case Temperature, Tc – °C


Ciss, Coss, Crss – V_{DS}
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, V_{DS} – V


SW Time – I_D
V_{DD}=10V
V_{GS}=10V
$t_{d(off)}$
t_f
t_r
$t_{d(on)}$
Switching Time, SW Time – ns
Drain Current, I_D – A


A S O
I_{DP}
I_D
10μs
100μs
1ms
10ms
DC operation
Operation in this area is limited by $R_{DS(on)}$
Tc=25°C
Single pulse
Drain Current, I_D – A
Drain-to-Source Voltage, V_{DS} – V