Ordering number:EN3442

N-Channel Silicon MOSFET

2SK1439

Ultrahigh-Speed Switching Applications

Features

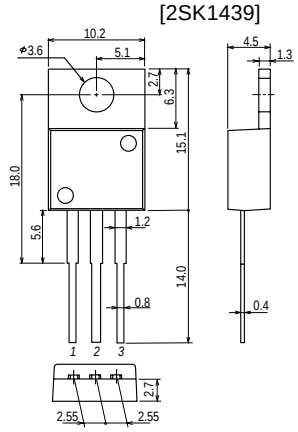
- Low ON-state resistance.
- Ultrahigh-speed switching.

Package Dimensions

unit:mm

2052C

[2SK1439]



1 : Gate
2 : Drain
3 : Source
EIAJ : SC-46
SANYO : TO-220AB

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		450	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	12	A
Allowable Power Dissipation	P_D	Tc=25°C	50	W
			1.75	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	450			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=450V, V_{GS}=0			1.0	mA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0			±100	nA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	2.0		3.0	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=1.5A	1.0	2.0		S
Static Drain-to-Source ON-State Resistance	$R_{DS(on)}$	I_D=1.5A, V_{GS}=10V		2.0	2.6	Ω

(Note) Be careful in handling the 2SK1439 because it has no protection diode between gate and source.

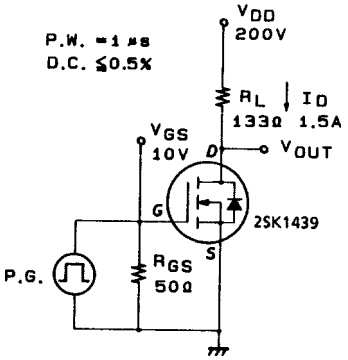
Continued on next page.

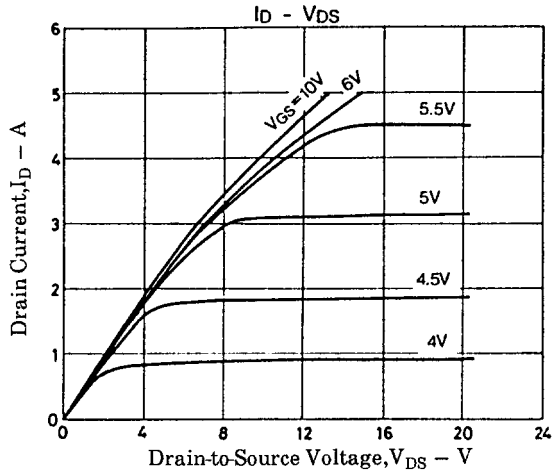
SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

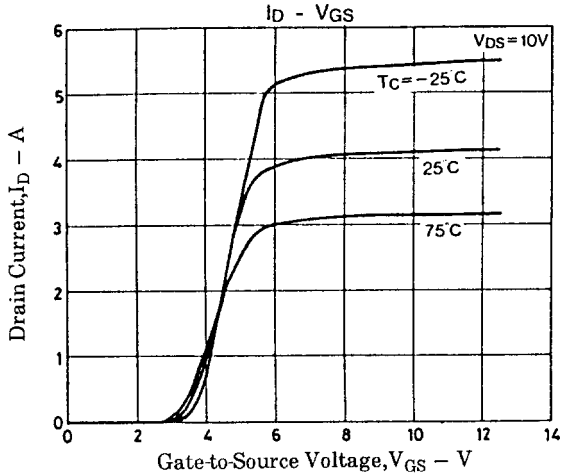
Continued from preceding page.

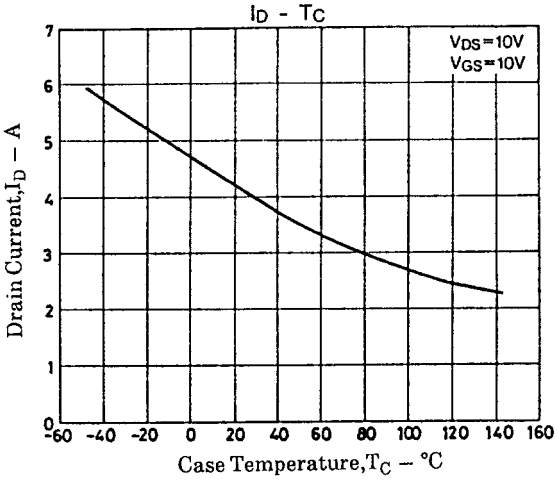
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		400		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		60		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		25		pF
Turn-ON Delay Time	$t_{d(on)}$	I_D=1.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		12		ns
Rise Time	t_r	I_D=1.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		20		ns
Turn-OFF Delay Time	$t_{d(off)}$	I_D=1.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		80		ns
Fall Time	t_f	I_D=1.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		35		ns
Diode Forward Voltage	V_{SD}	I_S=3A, V_{GS}=0			1.8	V

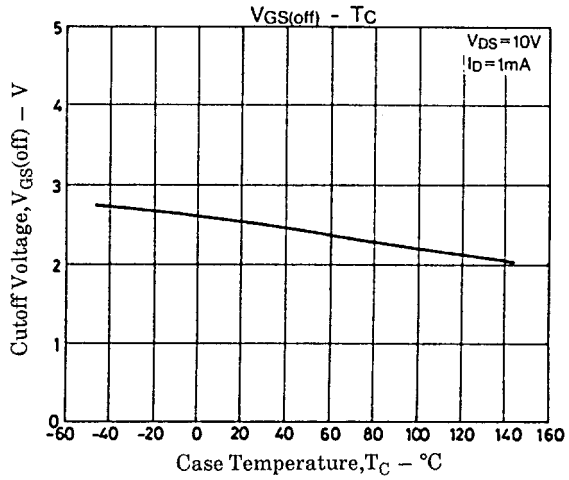
Switching Time Test Circuit

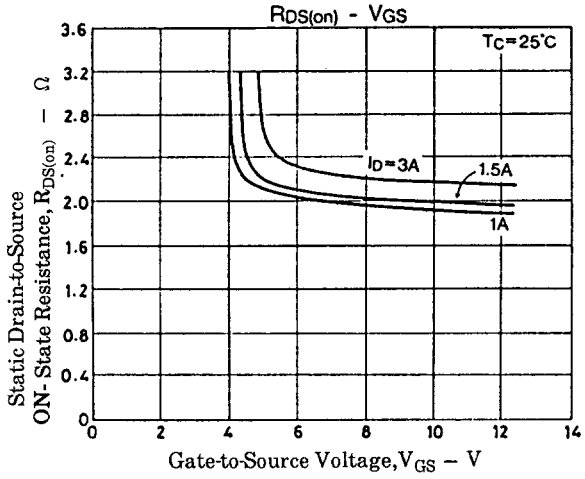


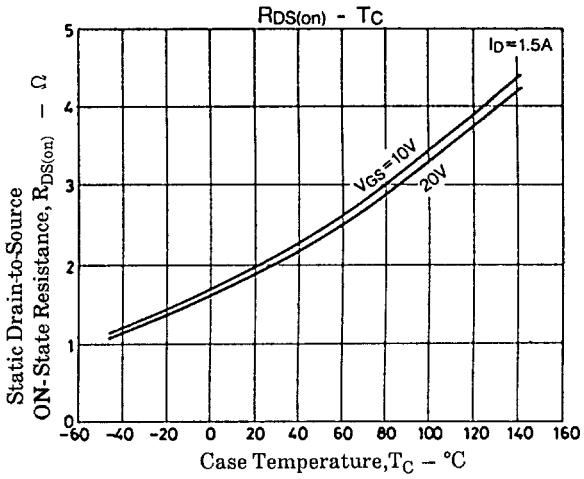


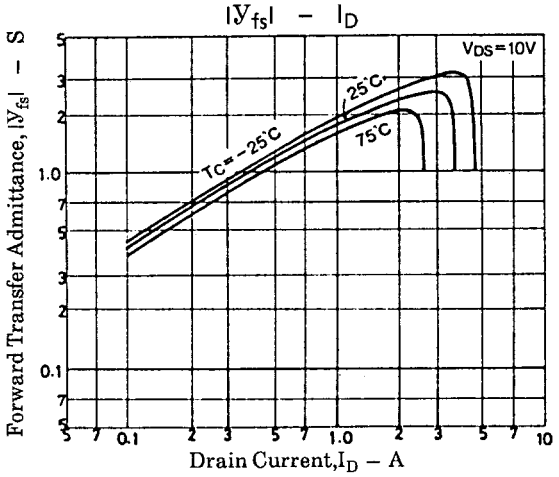


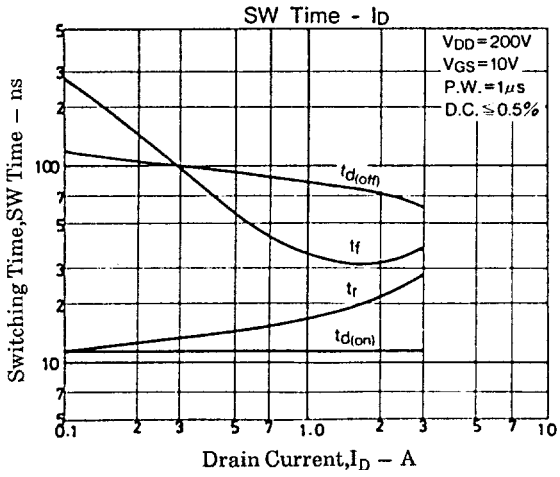


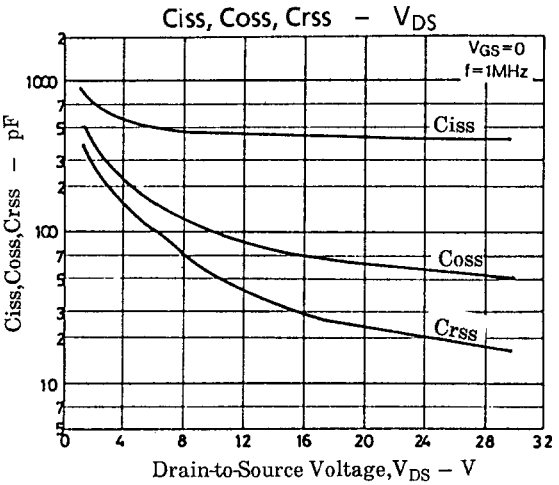


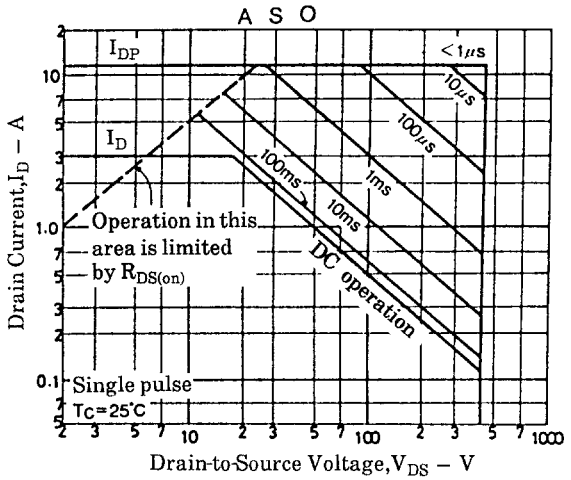

RDS(on) - VGS
Tc=25°C
ID=3A
1.5A
1A
Static Drain-to-Source ON-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V

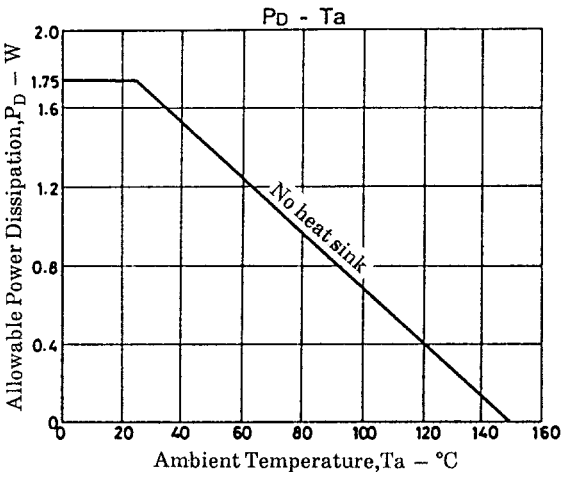

RDS(on) - Tc
ID=1.5A
VGS=10V
20V
Static Drain-to-Source ON-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C

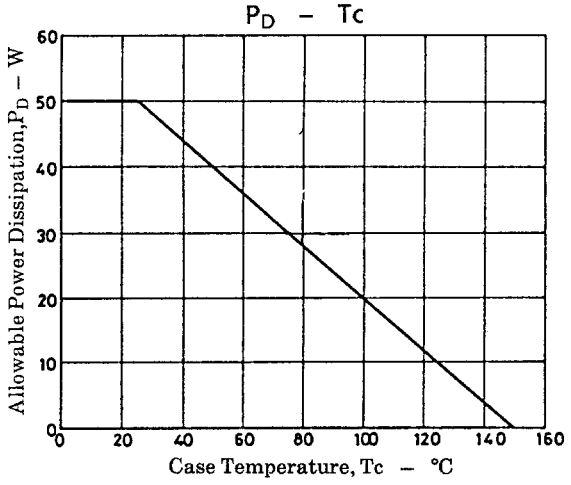

|Yfs| – ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, |Yfs| – S
Drain Current, ID – A


SW Time - ID
VDD=200V
VGS=10V
P.W.=1μs
D.C.≦0.5%
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A


Ciss, Coss, Crss – VDS
VGS=0
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V


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


PD - Ta
No heat sink
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C