Ordering number:EN3559

N-Channel Silicon MOSFET

2SK1421

Ultrahigh-Speed Switching Applications

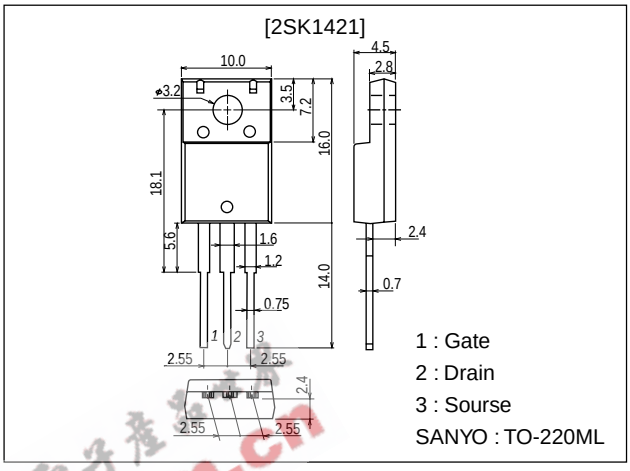
Features

- Low ON-state resistance.
- Ultrahigh-speed switching.
- Converters.
- Micaless package facilitating mounting.

Package Dimensions

unit:mm

2063A



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		40	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	160	A
Allowable Power Dissipation	P_D	Tc=25°C	40	W
			2.0	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	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0			±100	nA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	1.5		2.5	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=25A	15	25		S
Static Drain-to-Source ON-State Resistance	$R_{DS(on)}$	I_D=25A, V_{GS}=10V		0.02	0.026	Ω

(Note) Be careful in handling the 2SK1421 because it has no protection diode between gate and source.

Continued on next page.

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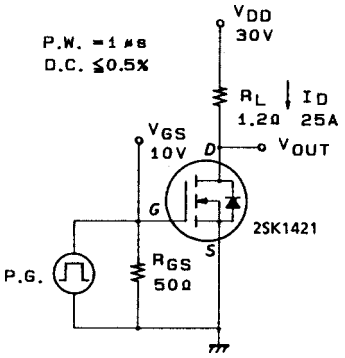
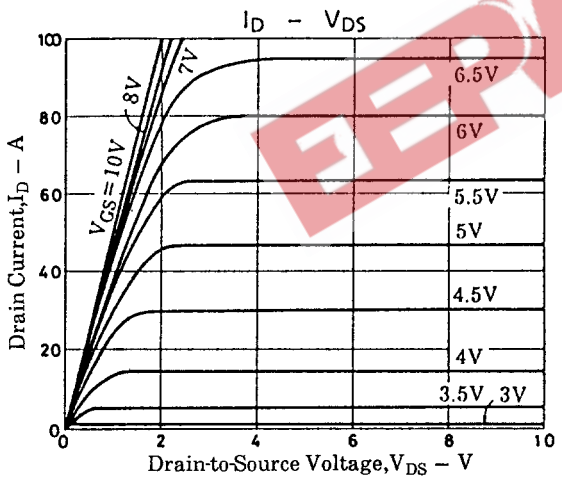
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

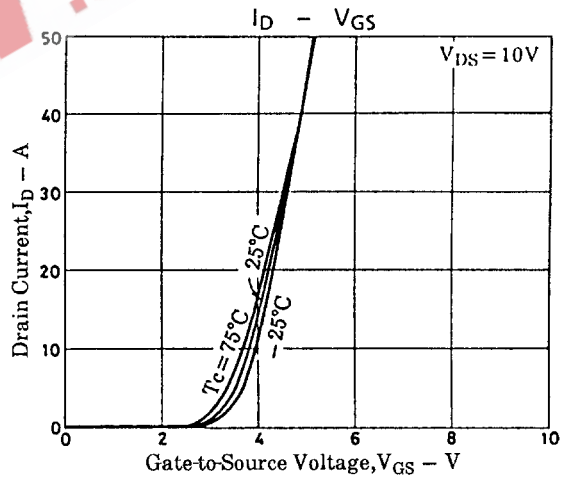
Continued from preceding page.

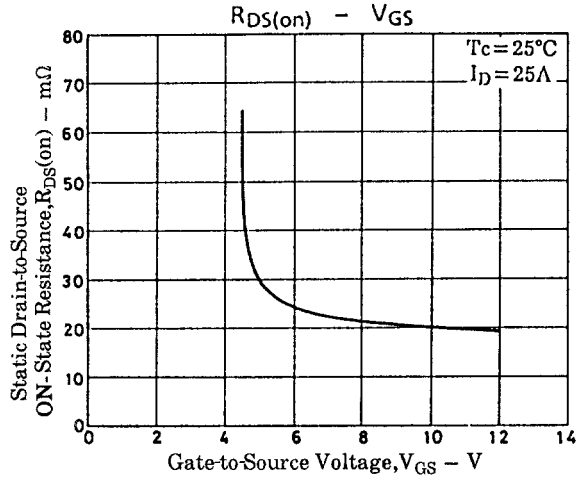
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		2400		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		1100		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		300		pF
Turn-ON Delay Time	$t_{d(on)}$	I_D=25A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		31		ns
Rise Time	t_r	I_D=25A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		159		ns
Turn-OFF Delay Time	$t_{d(off)}$	I_D=25A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		240		ns
Fall Time	t_f	I_D=25A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		140		ns
Diode Forward Voltage	V_{SD}	I_S=40A, V_{GS}=0			1.8	V

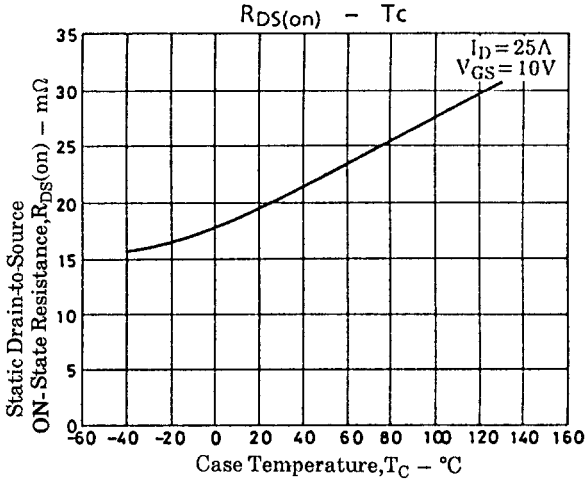
Switching Time Test Circuit

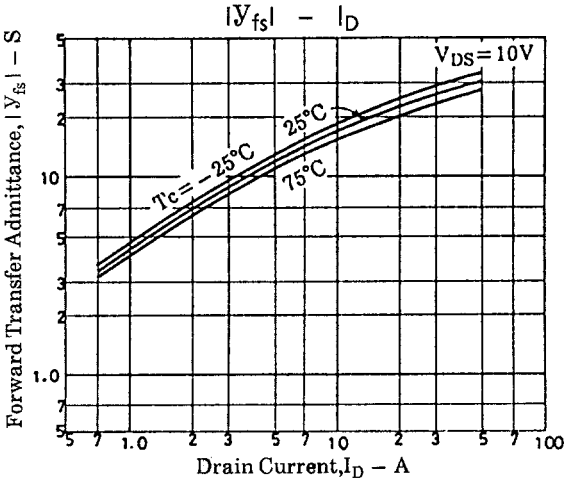


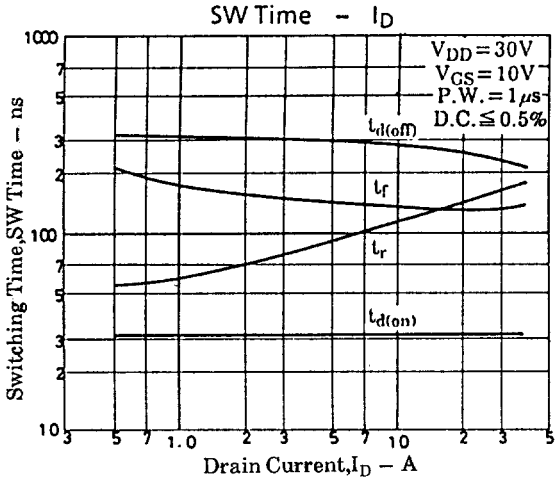


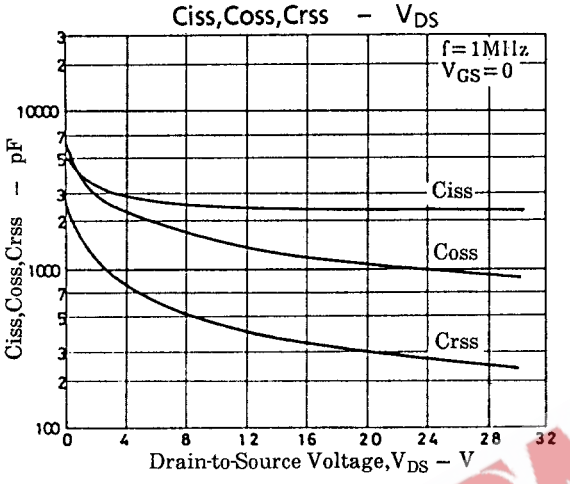


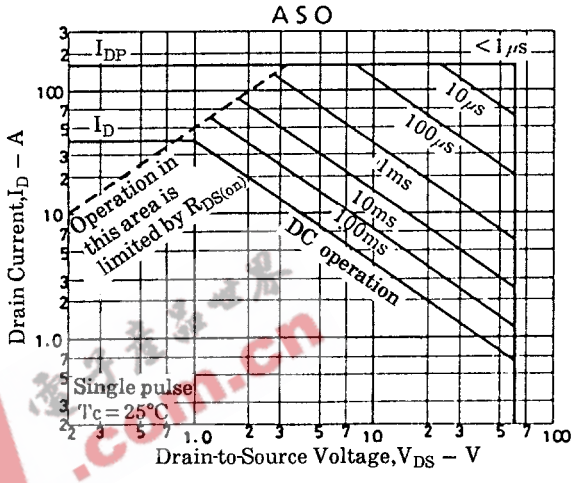


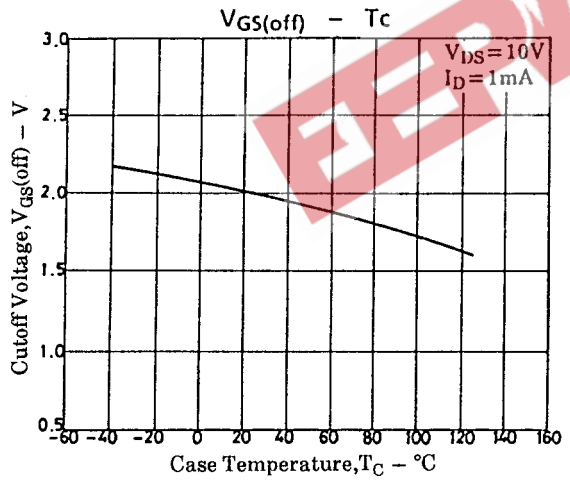


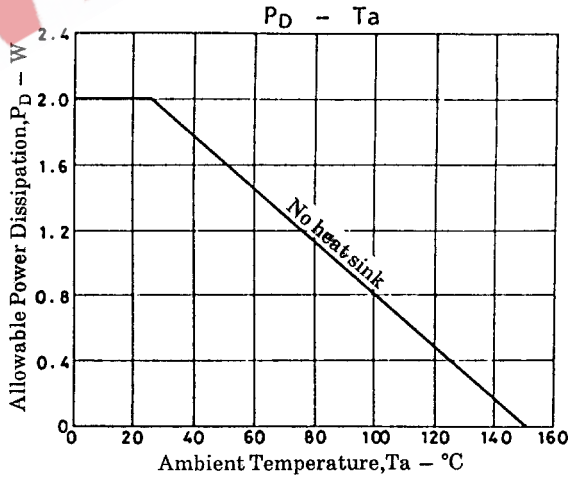

|Yfs| – ID
VDS=10V
Tc=–25°C
25°C
75°C
Forward Transfer Admittance, |Yfs| – S
Drain Current, ID – A

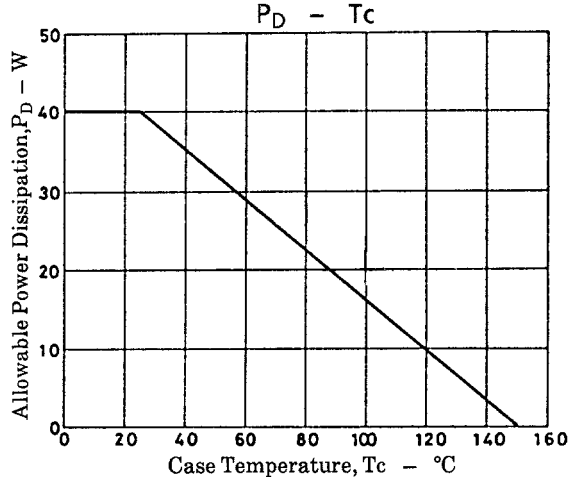

SW Time – ID
VDD=30V
VGS=10V
P.W.=1μs
D.C.≦0.5%
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A


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


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


VGS(off) – Tc
VDS=10V
ID=1mA
Cutoff Voltage, VGS(off) – V
Case Temperature, TC – °C


PD – Ta
No heatsink
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C


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