Ordering number:EN4229

N-Channel Silicon MOSFET

2SK1413

Ultrahigh-Speed Switching Applications

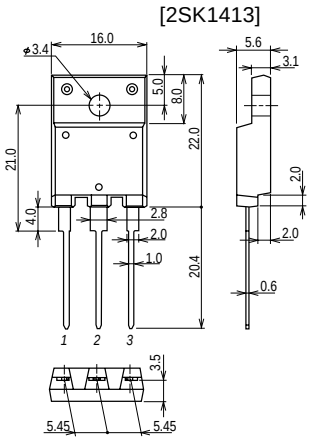
Features

- Low ON resistance, low input capacitance, Ultrahigh-speed switching.
- High reliability (Adoption of HVP process).
- Micaless package facilitating mounting.

Package Dimensions

unit:mm

2076B



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		1500	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		2	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	4	A
Allowable Power Dissipation	P_D		3.0	W
		Tc=25°C	60	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	1500			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, 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		3.5	V
Forward Transfer Admittance	| yfs |	V_{DS}=20V, I_D=1A	1.0	1.5		S
Static Drain-to-Source ON-State Resistance	$R_{DS(on)}$	I_D=1A, V_{GS}=10V		8.0	11.0	Ω

(Note) Be careful in handling the 2SK1413 because it has no protection diode between gate and source.

Continued on next page.

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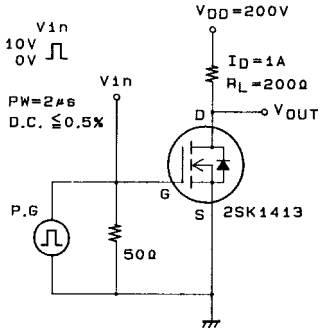
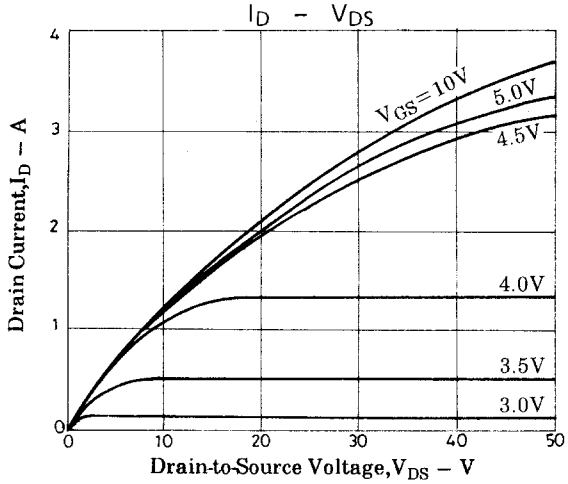
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

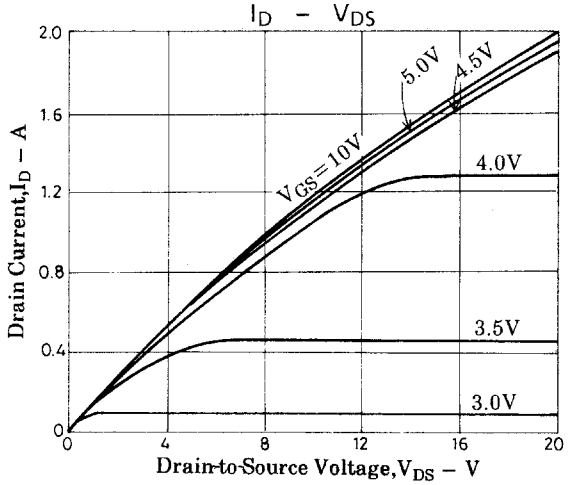
Continued from preceding page.

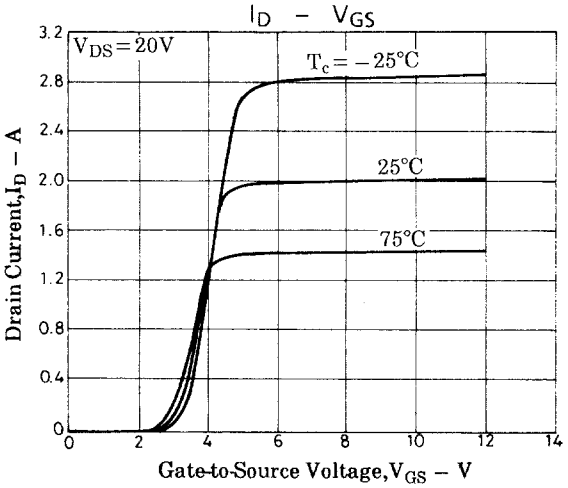
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		550		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		90		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		30		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		14		ns
Rise Time	t_r	See specified Test Circuit		16		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit		160		ns
Fall Time	t_f	See specified Test Circuit		40		ns
Diode Forward Voltage	V_{SD}	I_S=2A, V_{GS}=0		1.0	1.5	V

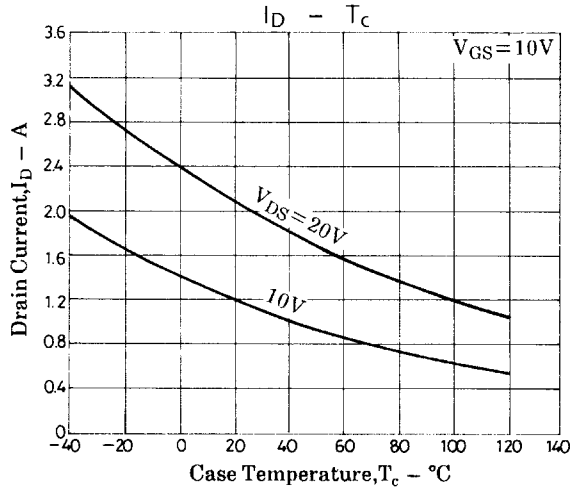
Switching Time Test Circuit

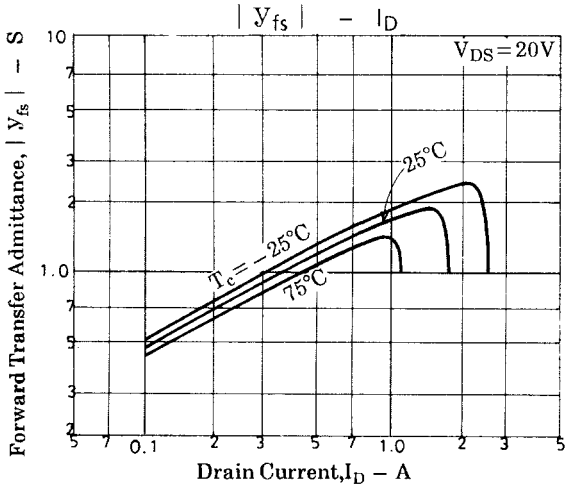


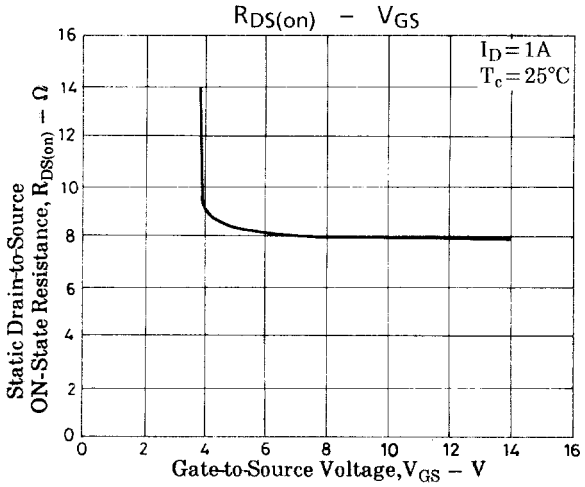


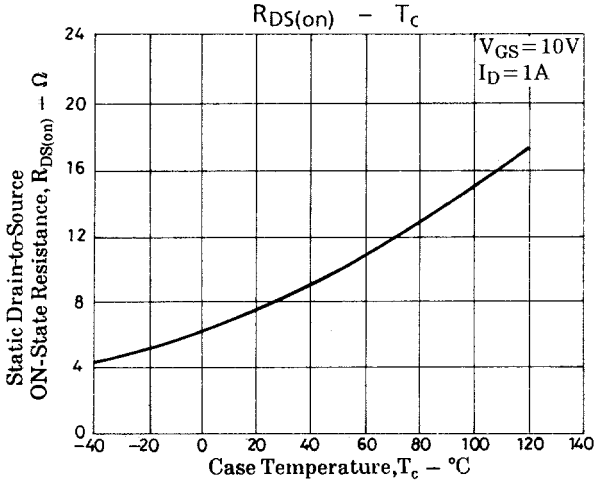


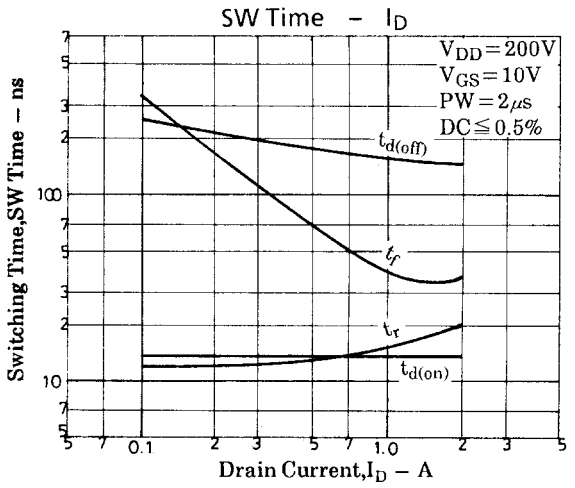


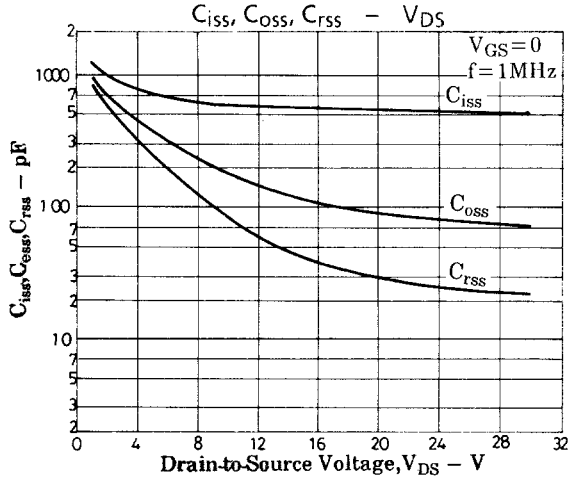


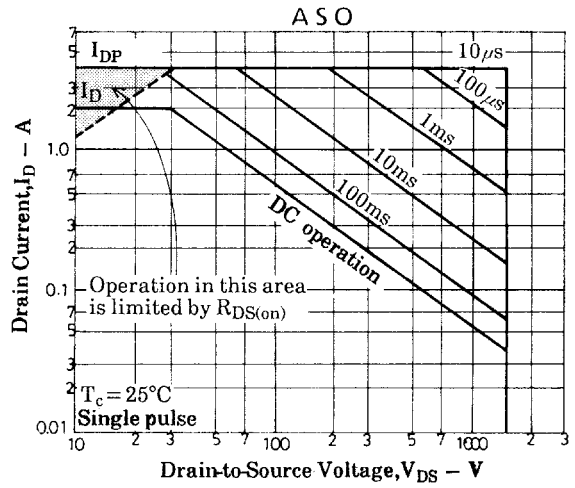

| yfs | – ID
VDS=20V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A

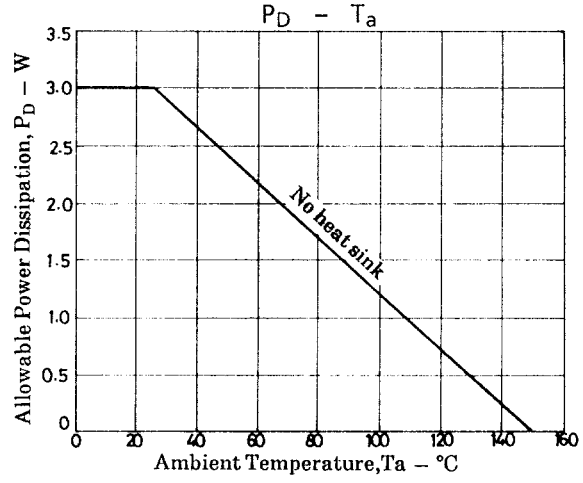

RDS(on) – VGS
ID=1A
Tc=25°C
Static Drain-to-Source ON-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V

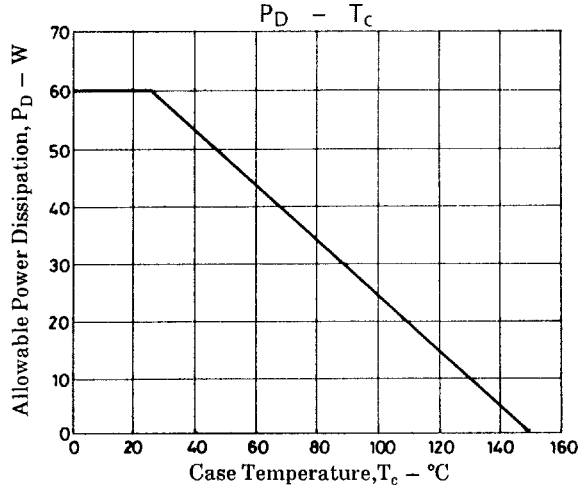

RDS(on) – Tc
VGS=10V
ID=1A
Static Drain-to-Source ON-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C


SW Time – ID
VDD=200V
VGS=10V
PW=2μs
DC≦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


ASO
IDP
ID
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on)
Tc=25°C
Single pulse
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