Ordering number:ENN4287A

N-Channel Silicon MOSFET

2SK2045

Ultrahigh-Speed Switching Applications

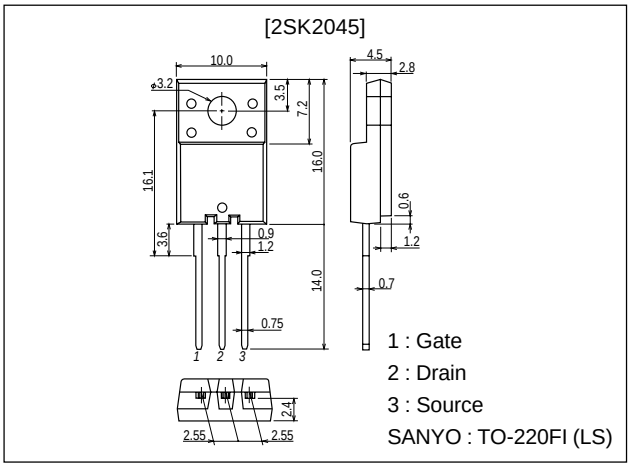
Features

- Low ON resistance.
- Ultrahigh-speed switching.
- High-speed diode built in (trr=140ns).
- Micaless package facilitating easy mounting.

Package Dimensions

unit:mm

2078B



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		5.5	A
Drain Current (pulse)	I_{DP}		22	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	35	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=10mA, V_{GS}=0	600			V
Zero-Gate Votlage Drain Current	I_{DSS}	V_{DS}=480V, 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=3A	2.3	4.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	I_D=3A, V_{GS}=10V		1.1	1.5	Ω

(Note) Be careful in handling the 2SK2045 because it has no protection diode between gate and source.

Continued on next page.

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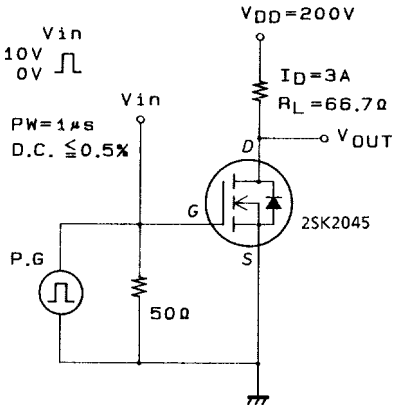
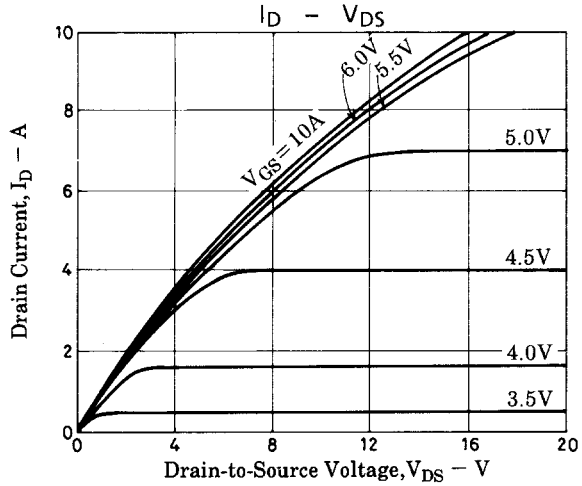
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

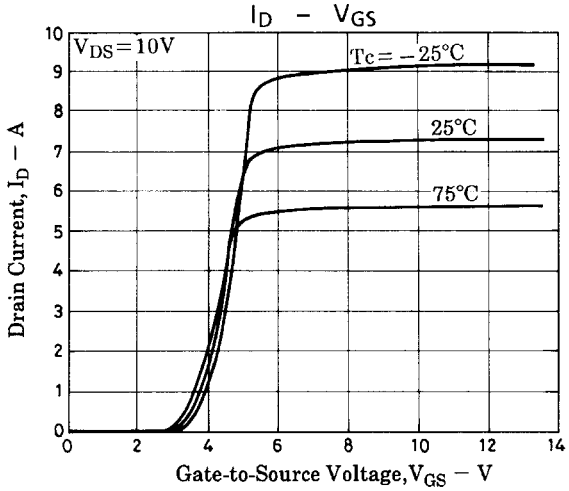
Continued from preceding page.

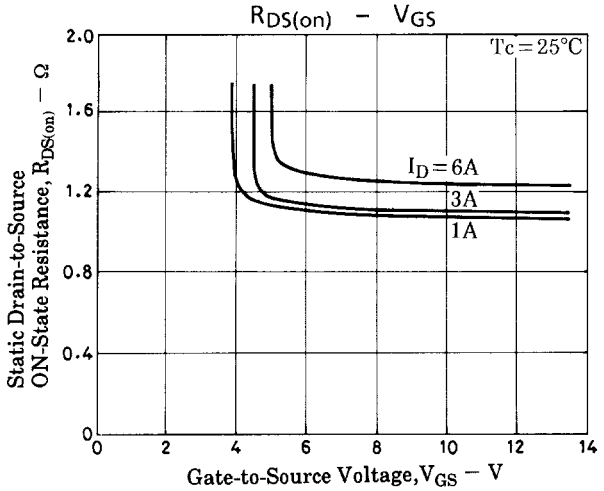
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		1100		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		150		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		45		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		18		ns
Rise Time	t_r	See specified Test Circuit.		25		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		240		ns
Fall Time	t_f	See specified Test Circuit.		60		ns
Diode Forward Voltage	V_{SD}	I_S=5.5A, V_{GS}=0			1.5	V
Diode Reverse Recovery Time	trr	I_S=5.5A, di/dt=100A/μs		140		ns

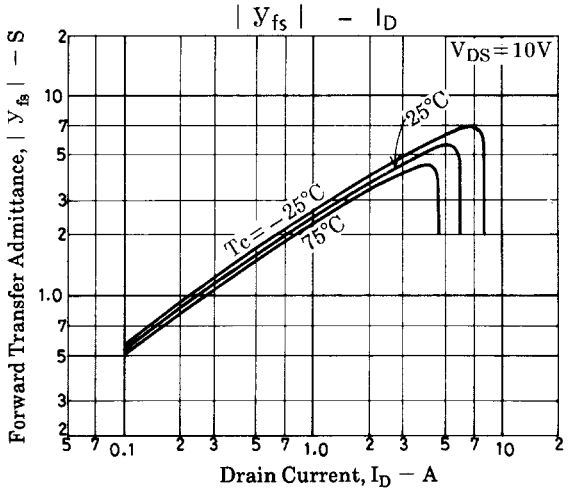
Switching Time Test Circuit

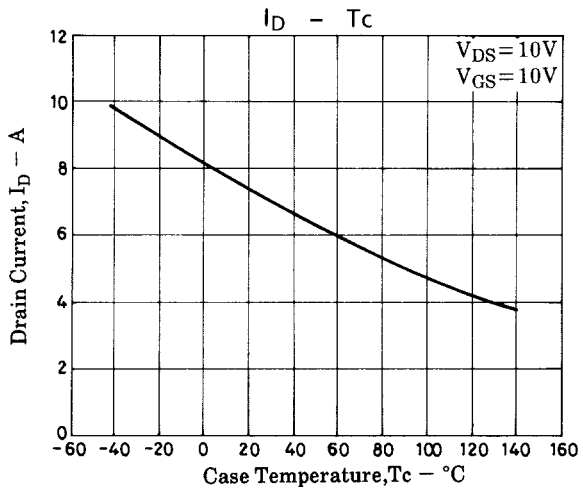


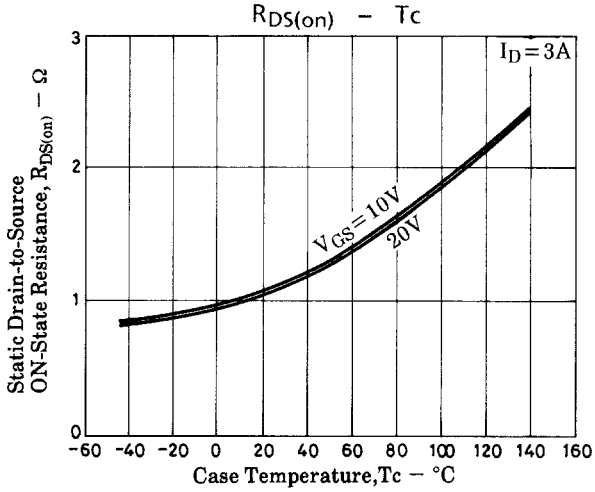


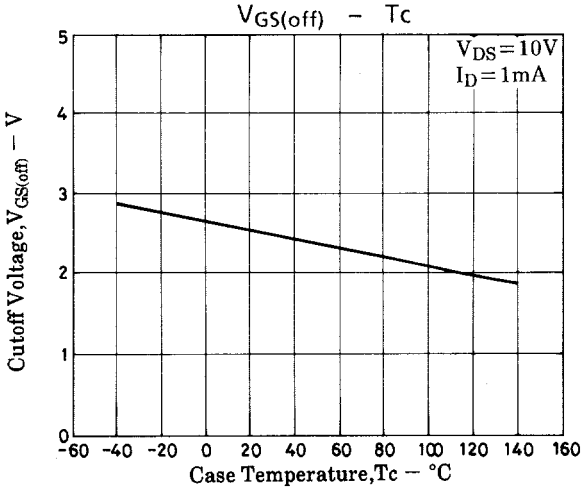


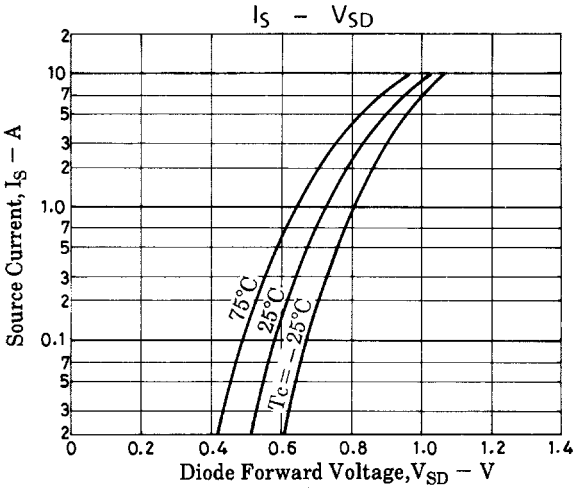


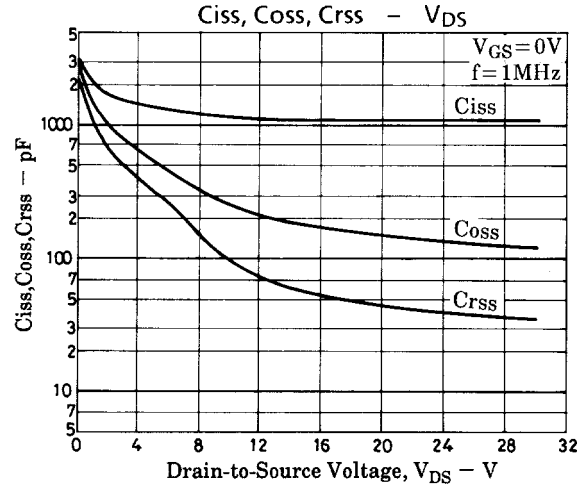


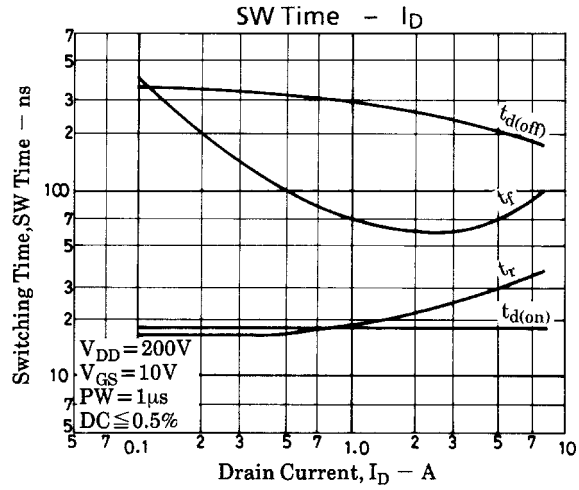

I_D – Tc
V_{DS}=10V
V_{GS}=10V
Drain Current, I_D – A
Case Temperature,Tc – °C

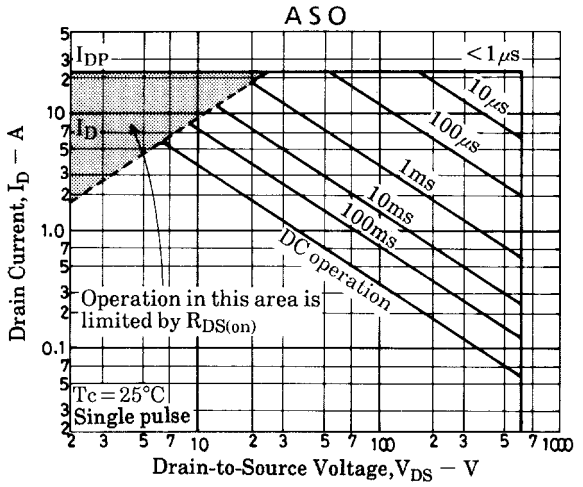

$R_{DS(on)}$ – Tc
I_D=3A
V_{GS}=10V
20V
Static Drain-to-Source ON-State Resistance, $R_{DS(on)}$ – Ω
Case Temperature,Tc – °C

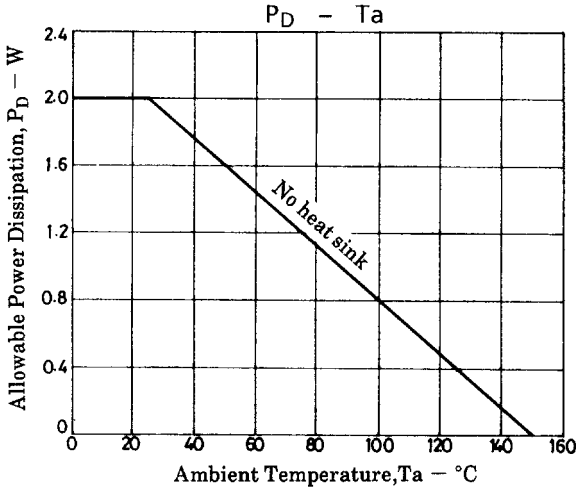

$V_{GS(off)}$ – Tc
V_{DS}=10V
I_D=1mA
Cutoff Voltage, $V_{GS(off)}$ – V
Case Temperature,Tc – °C


I_S – V_{SD}
75°C
25°C
Tc=–25°C
Source Current, I_S – A
Diode Forward Voltage,V_{SD} – V


Ciss, Coss, Crss – V_{DS}
V_{GS}=0V
f=1MHz
Ciss
Coss
Crss
Ciss,Coss,Crss – pF
Drain-to-Source Voltage, V_{DS} – V


SW Time – I_D
$t_{d(off)}$
t_f
t_r
$t_{d(on)}$
V_{DD}=200V
V_{GS}=10V
PW=1μs
DC≦0.5%
Switching Time,SW Time – ns
Drain Current, I_D – A


A S O
I_{DP}
I_D
<1μs
10μs
100μs
1ms
10ms
100ms
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


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