Ordering number : ENN3449B

N-Channel Silicon MOSFET

2SK1446LS

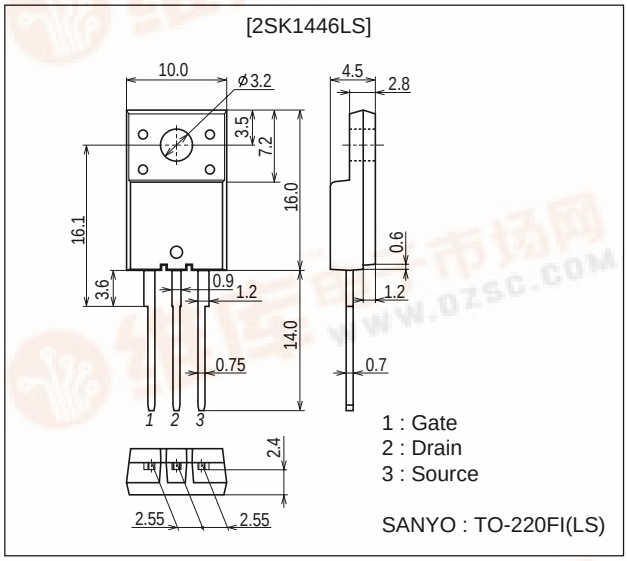
Ultrahigh-Speed Switching Applications

Features

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

Package Dimensions

unit : mm
2078C



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		7	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	28	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=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

(Note) Be careful in handling the 2SK1446LS because it has no protection diode between gate and source.

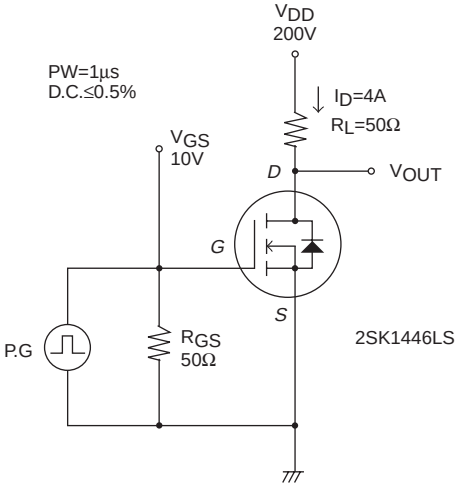
Continued on next page.

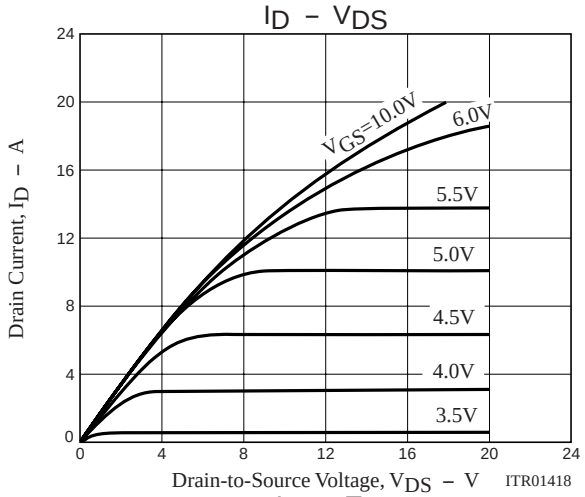
Marking : K1446

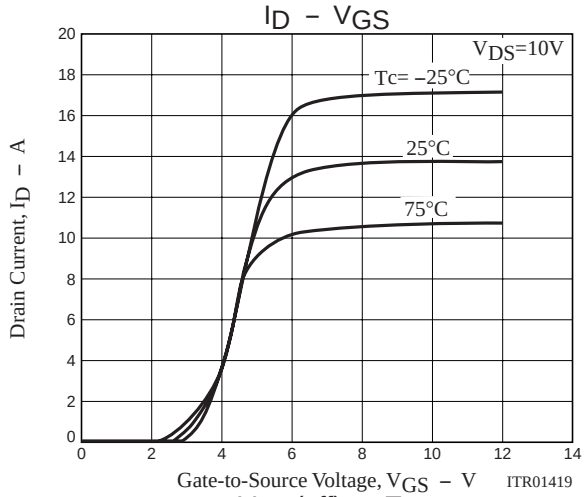
Continued from preceding page.

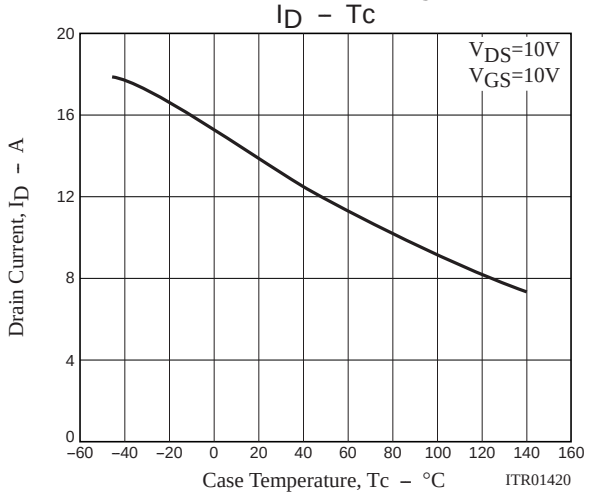
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	2.0		3.0	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=4A	3.0	6.0		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=4A, V_{GS}=10V		0.6	0.8	Ω
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		1200		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		180		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		70		pF
Turn-ON Delay Time	t_d(on)	I_D=4A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		20		ns
Rise Time	t_r	I_D=4A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		40		ns
Turn-OFF Delay Time	t_d(off)	I_D=4A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		160		ns
Fall Time	t_f	I_D=4A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50Ω		60		ns
Diode Forward Voltage	V_{SD}	I_S=7A, V_{GS}=0			1.8	V

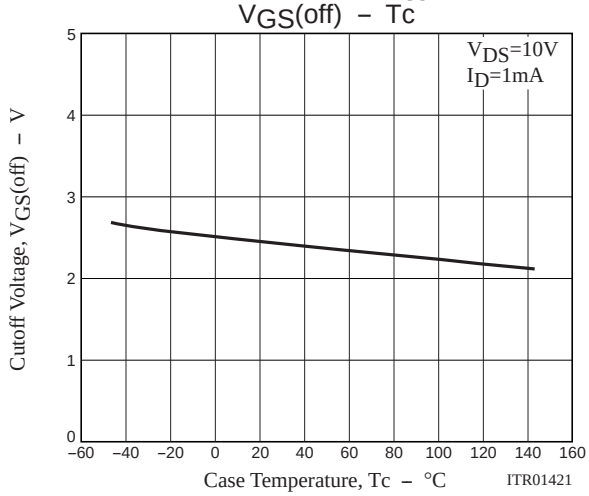
Switching Time Test Circuit

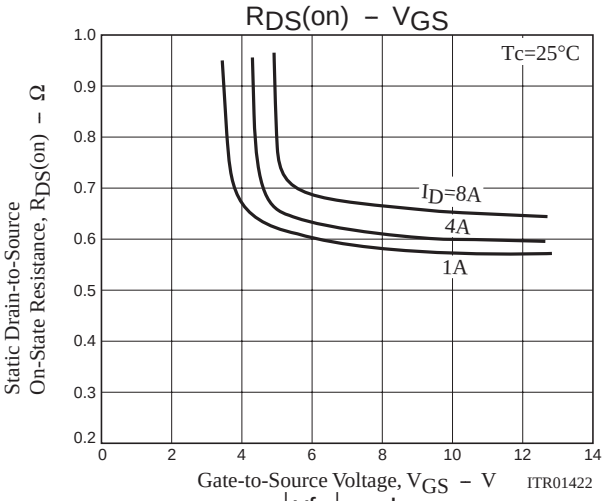


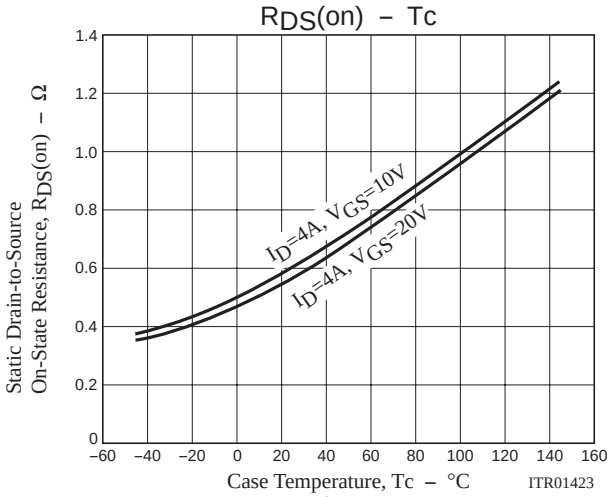


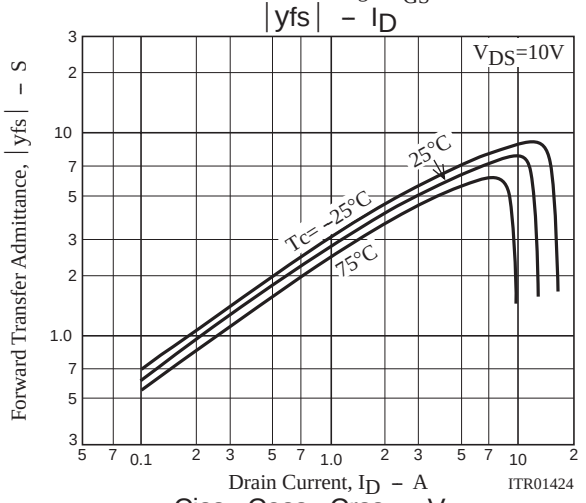


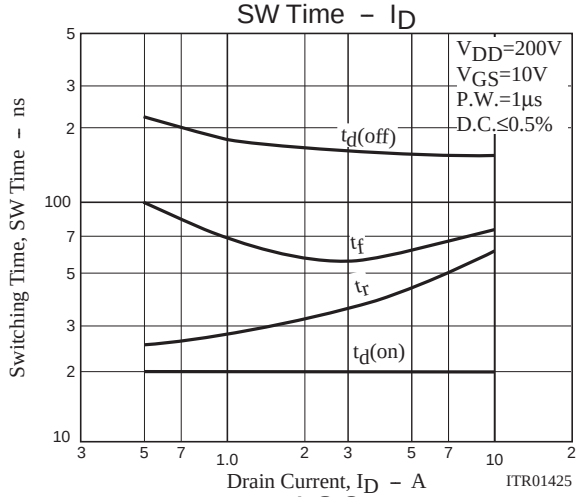


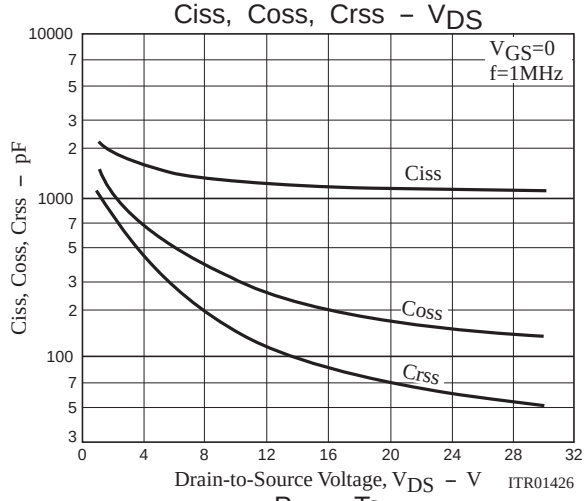


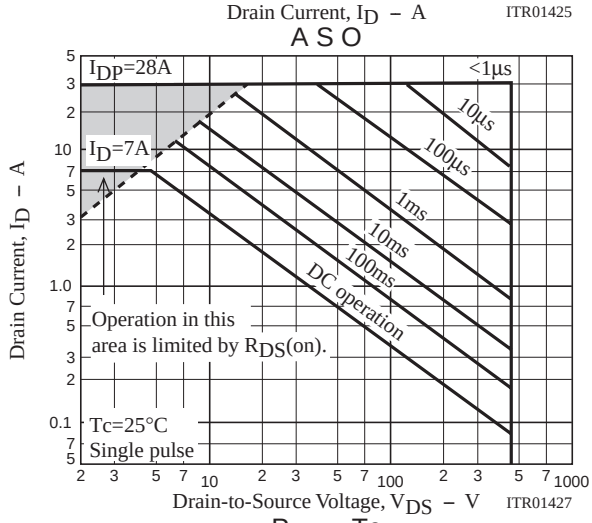

RDS(on) – VGS
Tc=25°C
ID=8A
4A
1A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
ITR01422

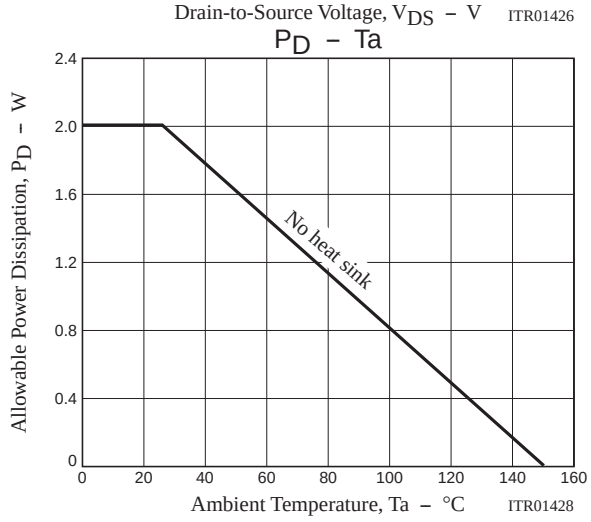

RDS(on) – Tc
ID=4A, VGS=10V
ID=4A, VGS=20V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
ITR01423

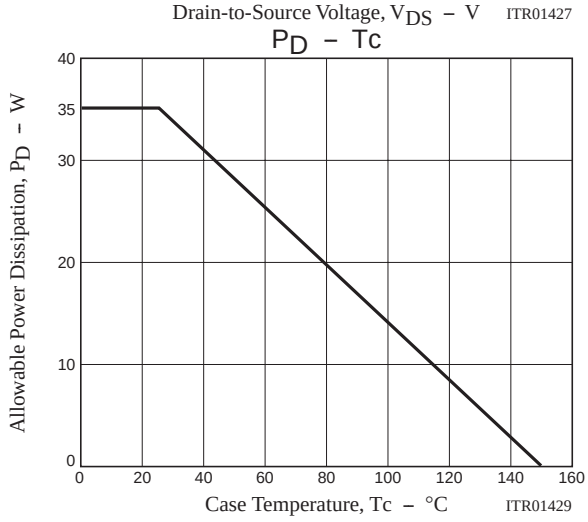

|yfs| – ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
ITR01424


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
ITR01425


Ciss, Coss, Crss – VDS
VGS=0
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
ITR01426


A S O
IDP=28A
ID=7A
<1µs
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
ITR01427


PD – Ta
No heat sink
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
ITR01428


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
ITR01429