ON Semiconductor®

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DATA SHEET

N-Channel Silicon MOSFET

2SK4043LS — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- 2.5V drive.
- Avalanche resistance guarantee.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		20	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	80	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	20	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		147	mJ
Avalanche Current *2	I_{AV}		20	A

Note : *1 V_{DD}=10V, L=500μH, I_{AV}=20A
*2 L≤500μH, Single pulse

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}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}= ±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS}(off)$	V_{DS}=10V, I_D=1mA	0.4		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=10A	15	25		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=10A, V_{GS}=4V		16	21	mΩ
	$R_{DS}(on)2$	I_D=10A, V_{GS}=2.5V		17	24	mΩ

Marking : K4043

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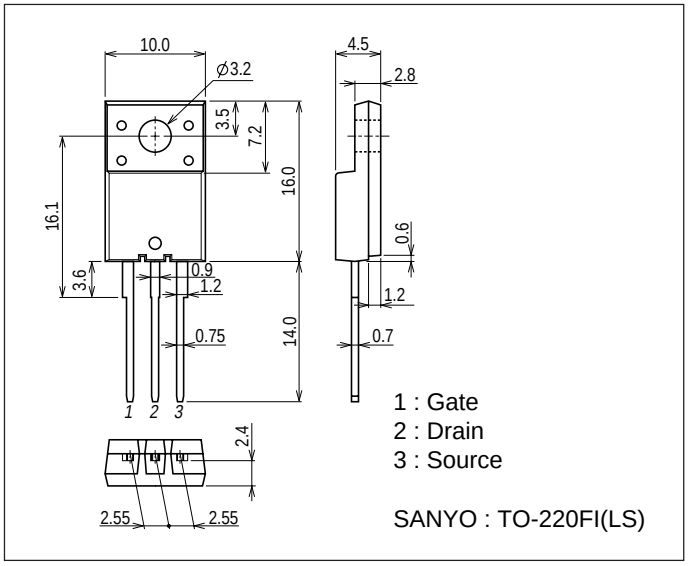
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		3000		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		360		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		300		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		27		ns
Rise Time	t_{r}	See specified Test Circuit.		190		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		370		ns
Fall Time	t_{f}	See specified Test Circuit.		280		ns
Total Gate Charge	Qg	V_{DS}=15V, V_{GS}=4V, I_{D}=20A		37		nC
Gate-to-Source Charge	Qgs	V_{DS}=15V, V_{GS}=4V, I_{D}=20A		3.9		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=15V, V_{GS}=4V, I_{D}=20A		12.6		nC
Diode Forward Voltage	V_{SD}	I_{S}=20A, V_{GS}=0V		1.0	1.2	V

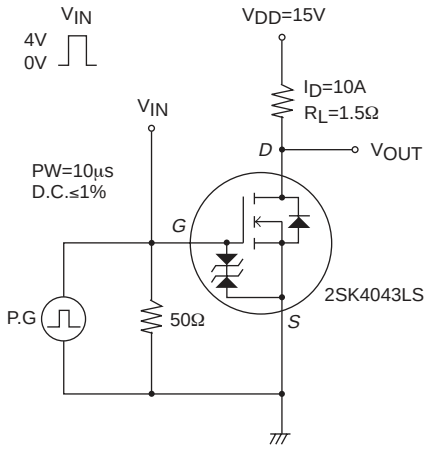
Package Dimensions

unit : mm

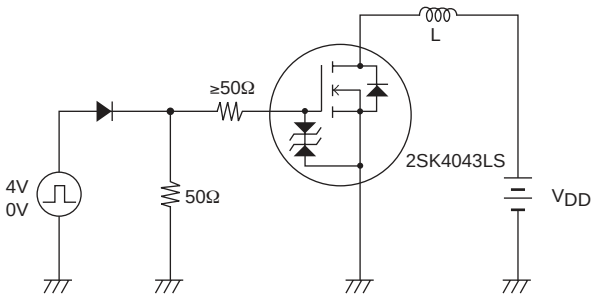
7509-002

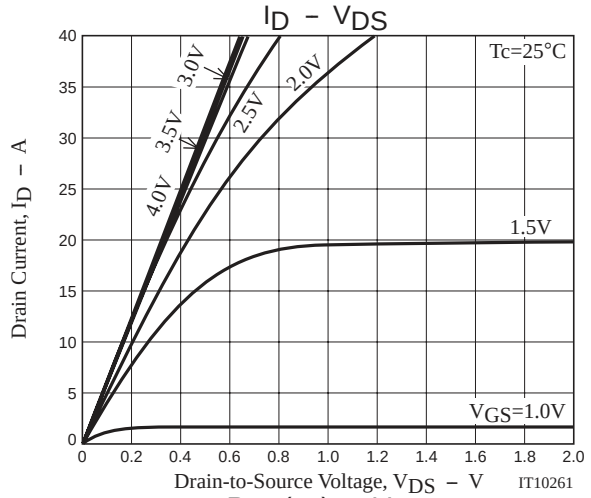


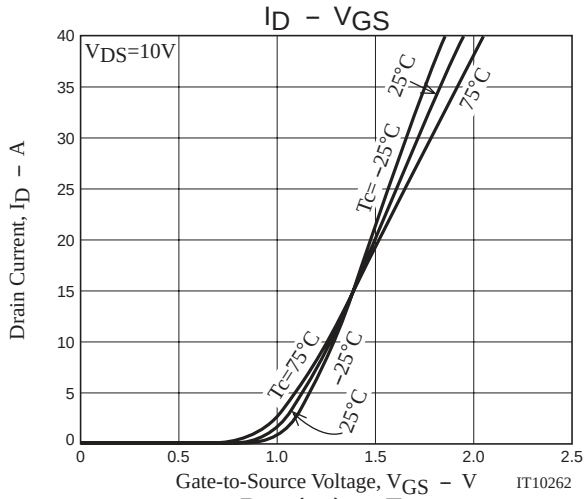
Switching Time Test Circuit

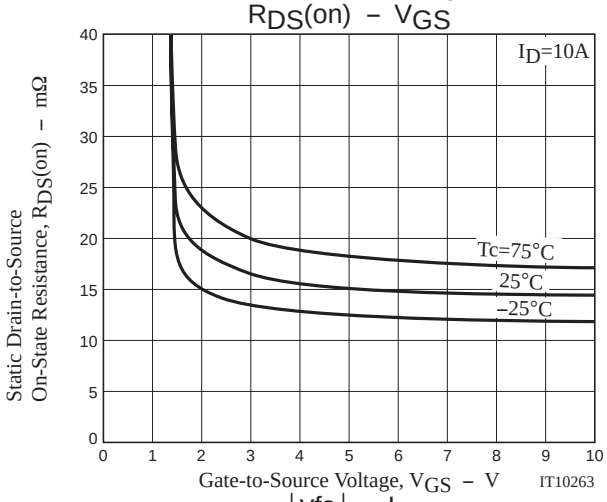


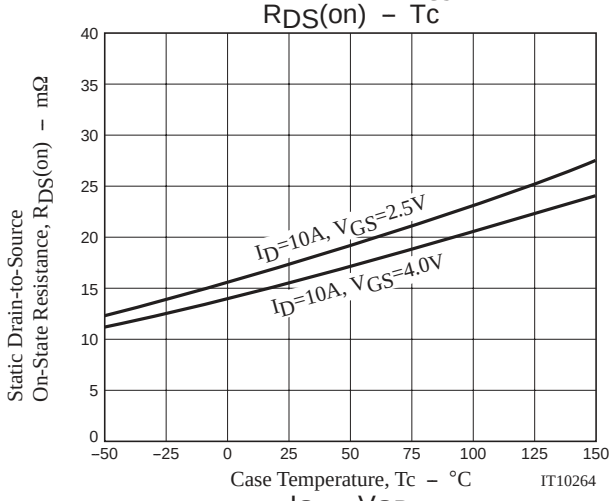
Avalanche Resistance Test Circuit

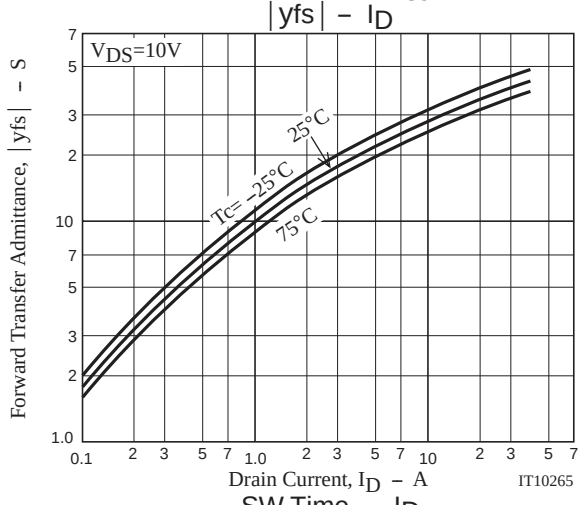


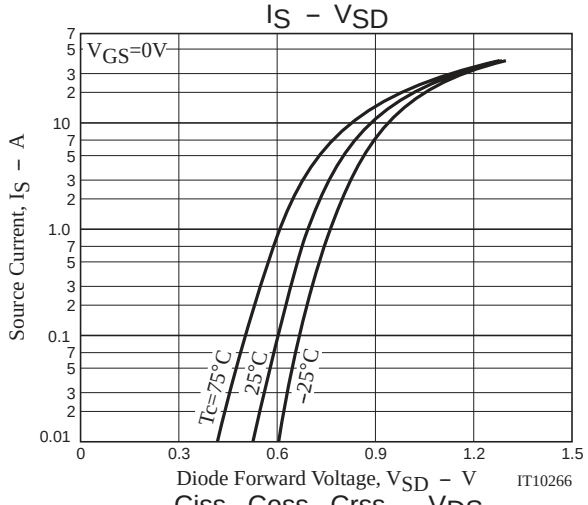

ID – VDS
Tc=25°C
3.0V
3.5V
4.0V
2.5V
2.0V
1.5V
VGS=1.0V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT10261

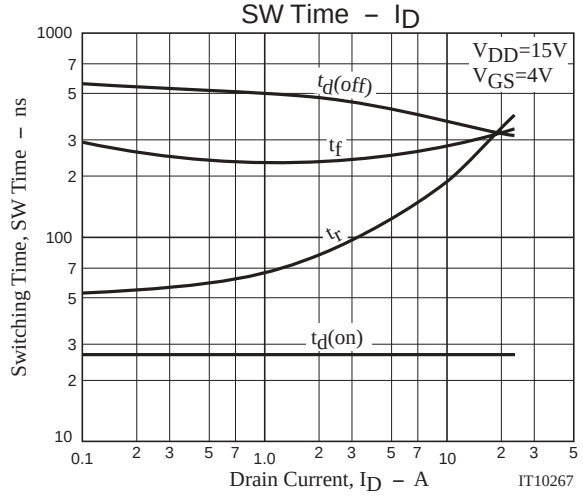

ID – VGS
VDS=10V
25°C
Tc=–25°C
75°C
Tc=75°C
–25°C
25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT10262

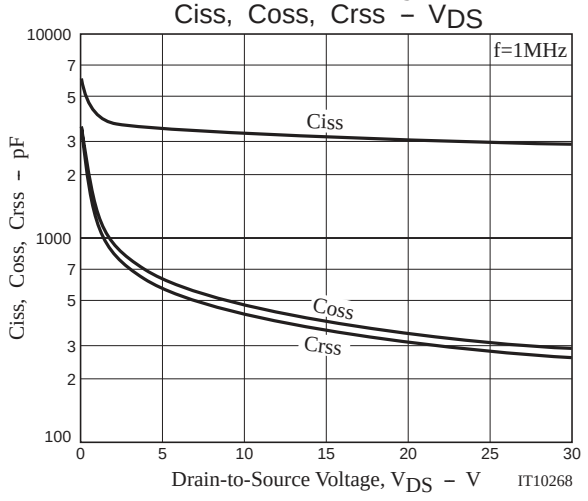

RDS(on) – VGS
ID=10A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT10263

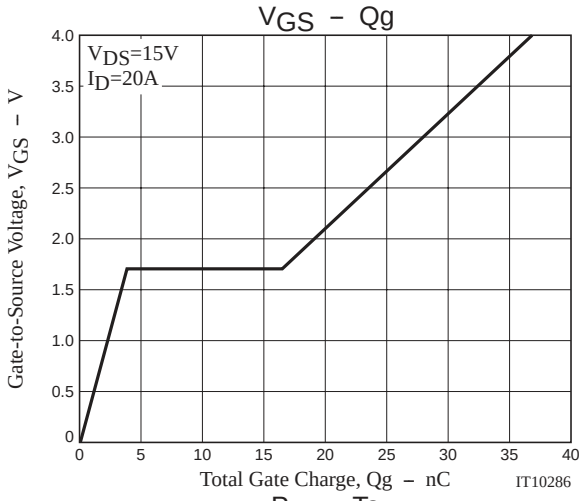

RDS(on) – Tc
ID=10A, VGS=2.5V
ID=10A, VGS=4.0V
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT10264

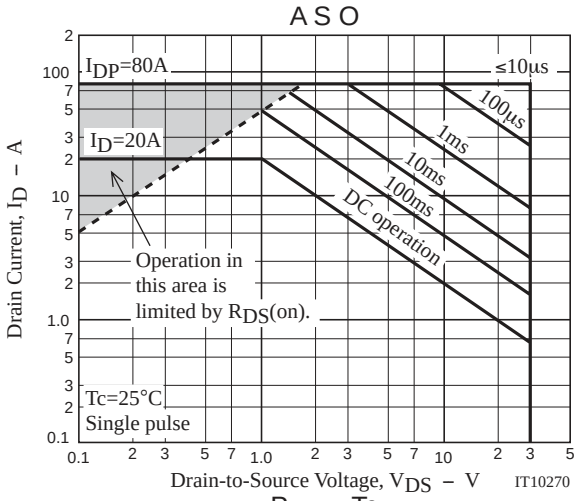

|yfs| – ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT10265

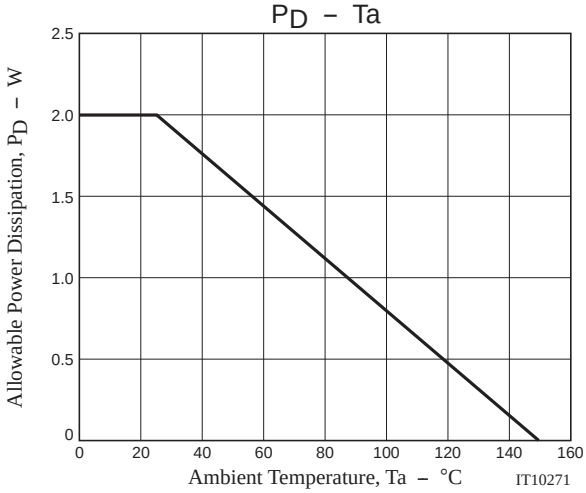

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT10266

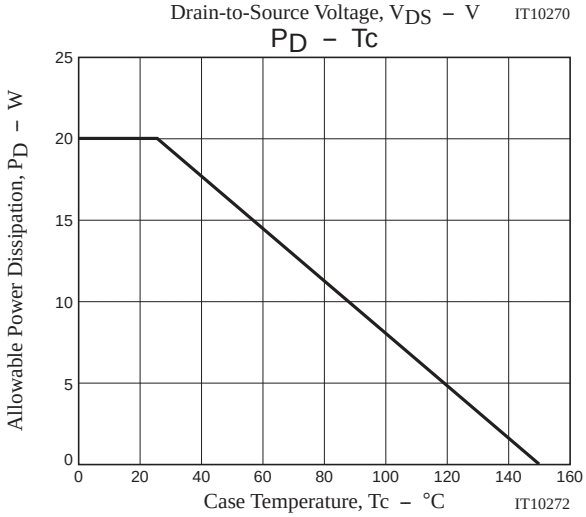

SW Time – ID
VDD=15V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT10267


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT10268









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