Ordering number : ENN8250A

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

2SK3748 — High-Voltage, High-Speed Switching Applications

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching.
- High reliability (Adoption of HVP process).
- Attachment workability is good by Mica-less package.
- Avalanche resistance guarantee.

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*		4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	8	A
Allowable Power Dissipation	P_D		3.0	W
		Tc=25°C	65	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		170	mJ
Avalanche Current *2	I_{AV}		4	A

*Shows chip capability

*1 V_{DD}=99V, L=20mH, I_{AV}=4A

*2 L≤20mH, 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	1500			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}= ±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	2.5		3.5	V
Forward Transfer Admittance	|yfs|	V_{DS}=20V, I_D=2A	1.7	2.8		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	I_D=2A, V_{GS}=10V		5	7	Ω

Marking : K3748

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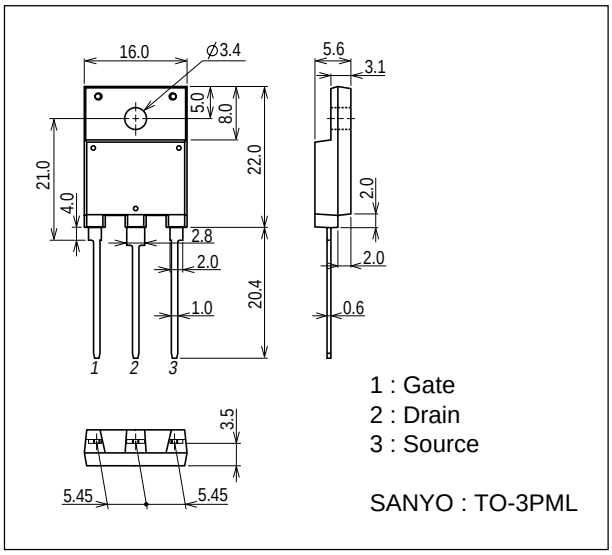
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		790		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		140		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		70		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		17		ns
Rise Time	t_{r}	See specified Test Circuit.		75		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		360		ns
Fall Time	t_{f}	See specified Test Circuit.		116		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_{D}=4A		80		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_{D}=4A		6.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_{D}=4A		36		nC
Diode Forward Voltage	V_{SD}	I_{S}=4A, V_{GS}=0V		0.94	1.2	V
Reverse Recovery Time	t_{rr}	I_{S}=4A, V_{GS}=0V, dis/dt=100A/μs		340		ns

Note) Although the protection diode is contained between gate and source, be careful of handling enough.

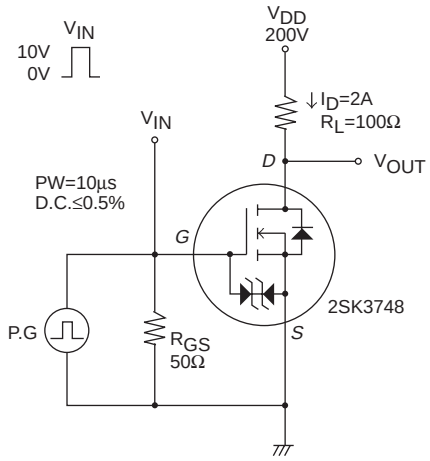
Package Dimensions

unit : mm

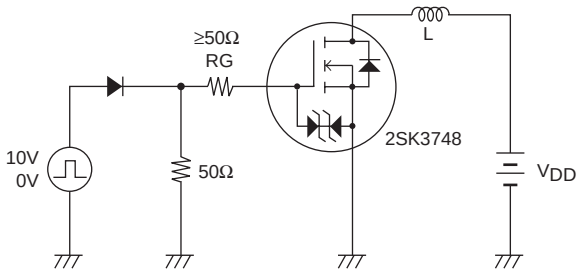
7505-003

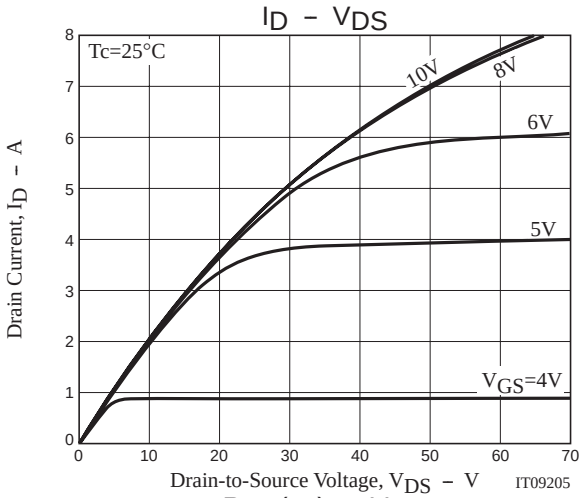


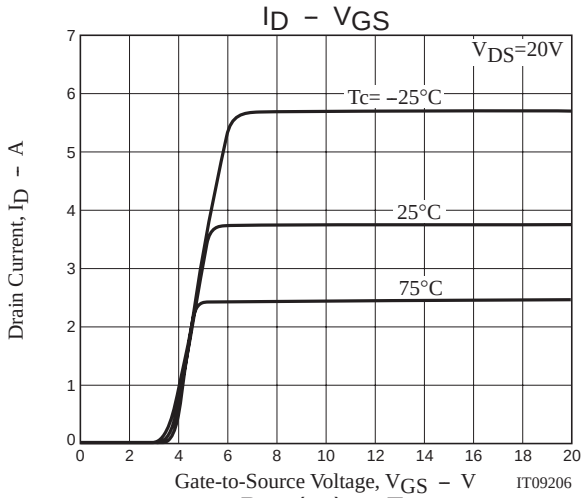
Switching Time Test Circuit

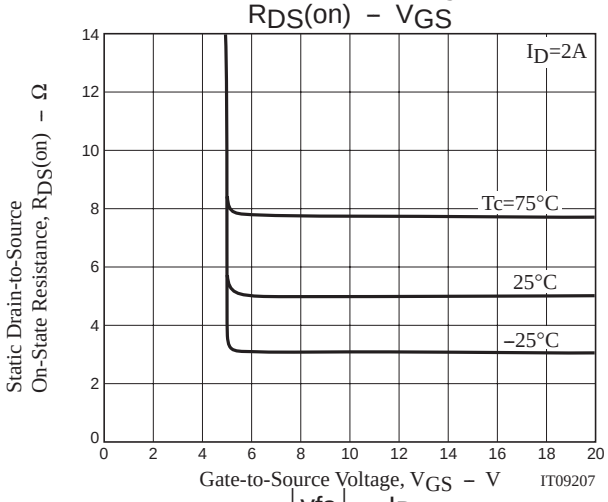


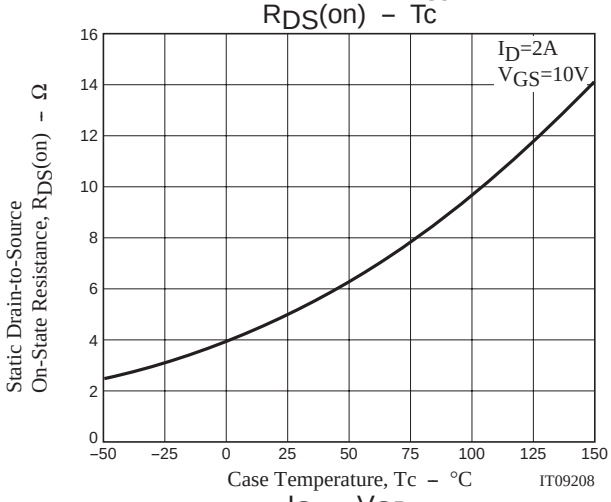
Avalanche Resistance Test Circuit

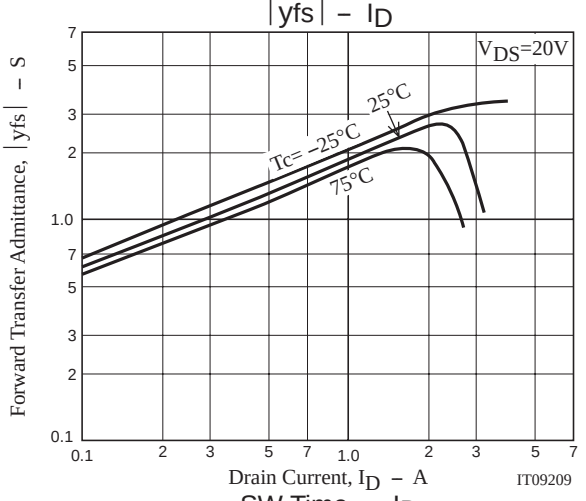


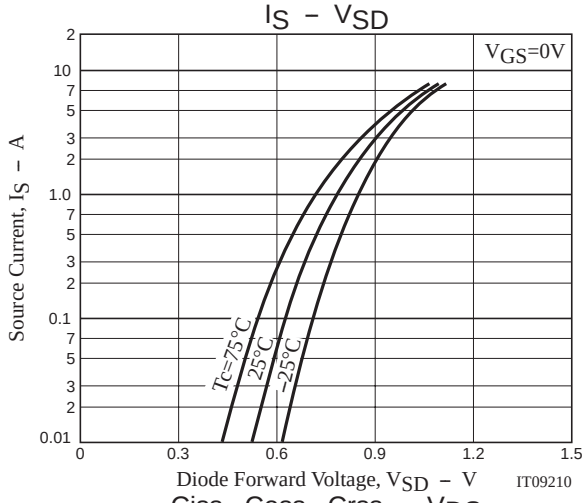

ID – VDS
Tc=25°C
10V
8V
6V
5V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT09205

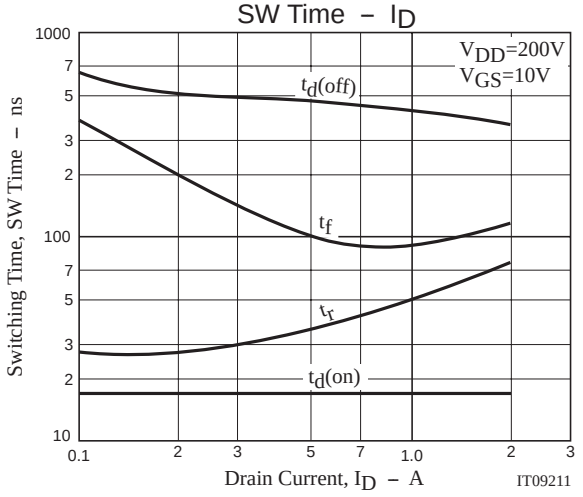

ID – VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT09206

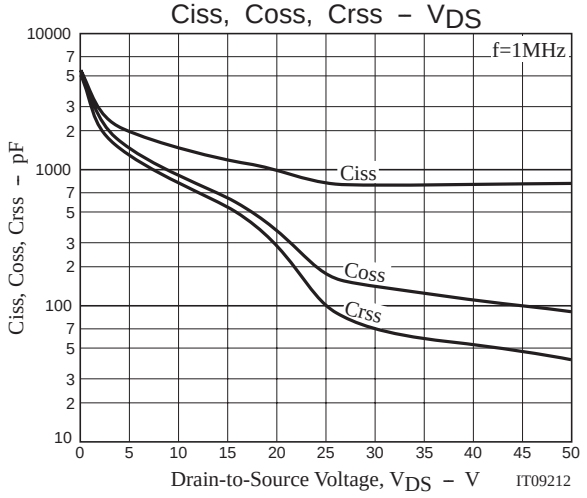

RDS(on) – VGS
ID=2A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT09207

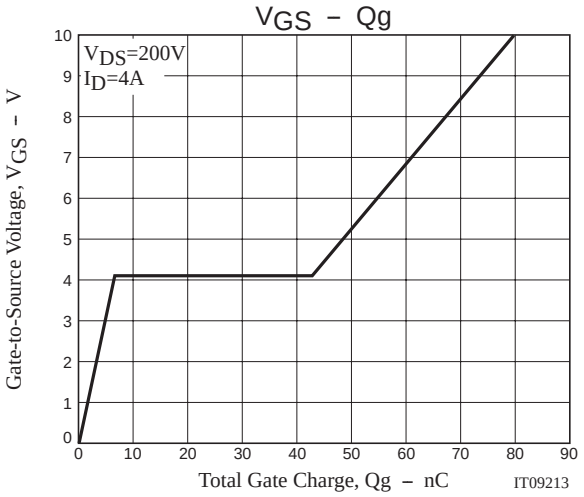

RDS(on) – Tc
ID=2A
VGS=10V
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT09208

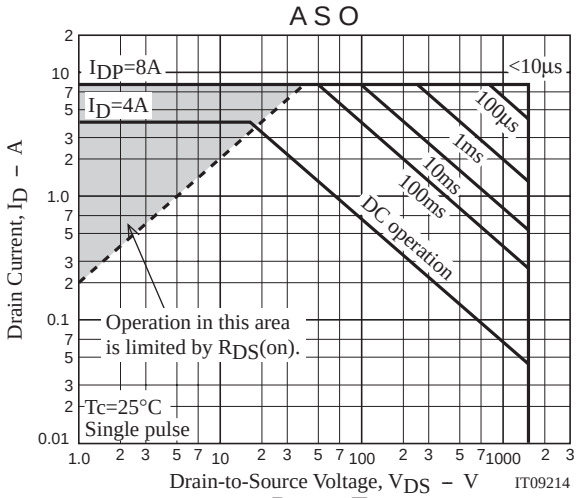

|yfs| – ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT09209

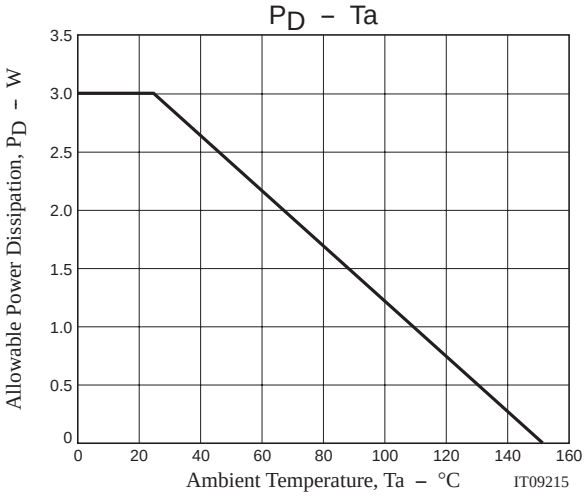

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT09210

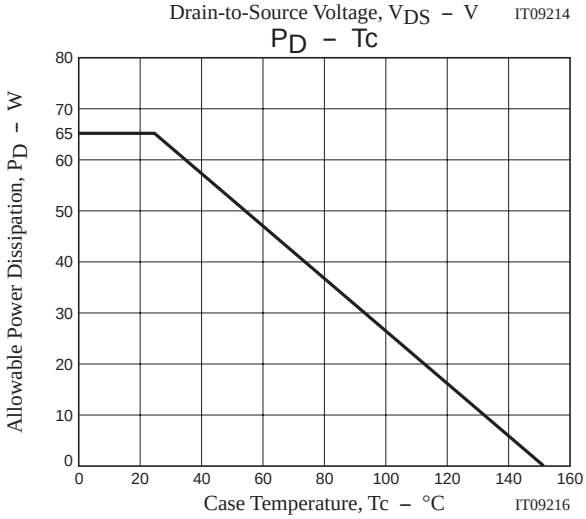

SW Time – ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT09211


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT09212









Note on usage : Since the 2SK3748 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.