SMA5114

N-channel

With built-in flywheel diode

External dimensions Ⓑ ··· SMA

Absolute maximum ratings (Ta=25°C)

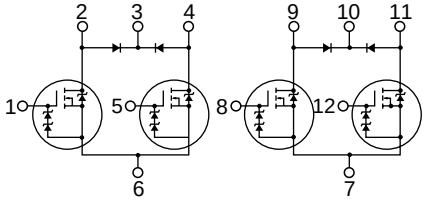
Symbol	Ratings	Unit
V_{DSS}	60	V
V_{GSS}	±20	V
I_D	±3	A
$I_{D(pulse)}$	±6 (PW≤1ms, Du≤1%)	A
E_{AS}*	6.8	mJ
I_{AS}	3	A
P_T	4 (Ta=25°C, with all circuits operating, without heatsink)	W
	28 ((Tc=25°C,with all circuits operating, with infinite heatsink)	W
θj–a	31.2 (Junction-Air, Ta=25°C, with all circuits operating)	°C/W
θj–c	4.46 (Junction-Case, Tc=25°C, with all circuits operating)	°C/W
Tch	150	°C
Tstg	–40 to +150	°C

* : V_{DD}=20V, L=1mH, I_L=3A, unclamped, see Fig. E on page 15.

Electrical characteristics (Ta=25°C)

Symbol	Specification min	typ	max	Unit	Conditions
$V_{(BR)DSS}$	60			V	I_D=100μA, V_{GS}=0V
I_{GSS}			±10	μA	V_{GS}=±20V
I_{DSS}			100	μA	V_{DS}=60V, V_{GS}=0V
V_{TH}	1.0		2.5	V	V_{DS}=10V, I_D=250μA
$Re_{(yfs)}$	1.0	2.3		S	V_{DS}=10V, I_D=1.0A
$R_{DS(ON)}$		0.20	0.25	Ω	V_{GS}=10V, I_D=1.0A
		0.25	0.30	Ω	V_{GS}=4V, I_D=1.0A
Ciss		170		pF	V_{DS}=10V,
Coss		130		pF	f=1.0MHz,
Crss		20		pF	V_{GS}=0V
$t_{d(on)}$		80		ns	I_D=1A,
t_r		170		ns	V_{DD}≒30V,
$t_{d(off)}$		330		ns	R_L=30Ω, V_{GS}=5V,
t_f		150		ns	see Fig. 3 on page 16.
V_{SD}		1.0	1.5	V	I_{SD}=3A, V_{GS}=0V
t_{rr}		80		ns	I_{SD}=±100mA

■Equivalent circuit diagram

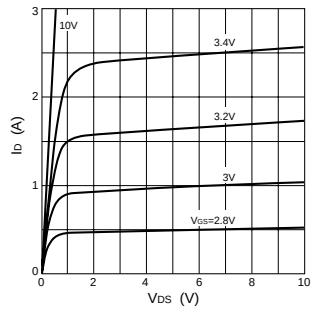


●Diode for flyback voltage absorption

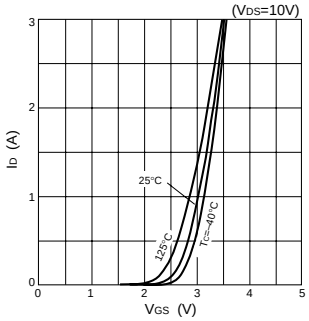
Symbol	Specification min	typ	max	Unit	Conditions
V_R	120			V	I_R=10μA
V_F		1.0	1.2	V	I_F=1A
I_R			10	μA	V_R=120V
t_{rr}		100		ns	I_F=±100mA

Characteristic curves

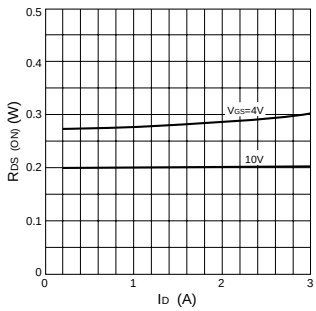
I_D-V_{DS} Characteristics (Typical)



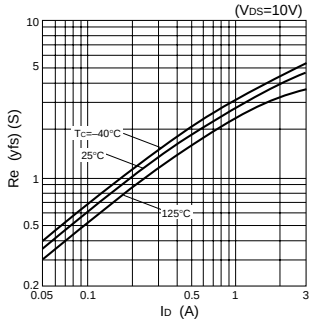
I_D-V_{GS} Characteristics (Typical)



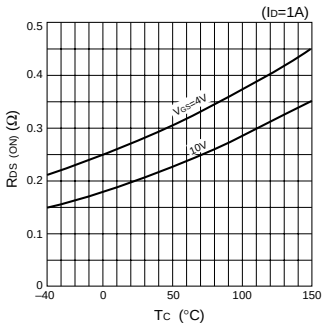
$R_{DS(ON)}$-I_D Characteristics (Typical)



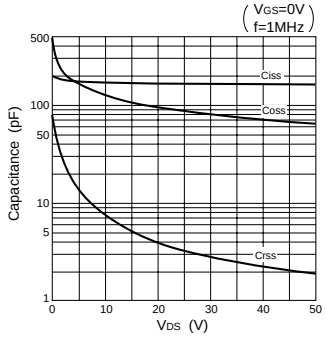
$Re_{(yfs)}$-I_D Characteristics (Typical)



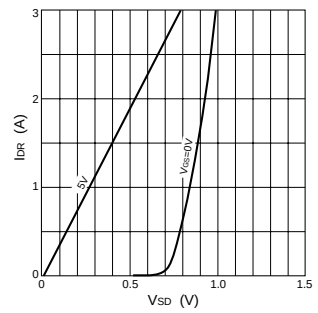
$R_{DS(ON)}$-T_C Characteristics (Typical)



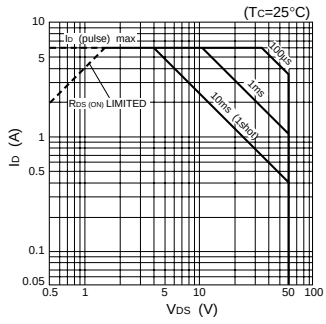
Capacitance-V_{DS} Characteristics (Typical)



I_{DR}-V_{SD} Characteristics (Typical)



Safe Operating Area (SOA)



P_T-T_a Characteristics