SMA5117

N-channel

3-phase DC motor 100V AC direct drive **External dimensions Ⓑ···SMA**

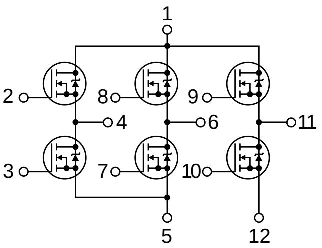
Absolute maximum ratings

(Ta=25°C)

Symbol	Ratings	Unit
V_{DSS}	250	V
V_{GSS}	±20	V
I_D	±7	A
$I_{D(pulse)}$	±15 (PW≤1ms, Du≤1%)	A
E_{AS}*	120	mJ
P_T	4 (Ta=25°C, with all circuits operating, without heatsink)	W
	35 (Tc=25°C, with all circuits operating, with infinite heatsink)	W
θ_{j-a}	31.2 (Junction-Air, Ta=25°C, with all circuits operating)	°C/W
θ_{j-c}	3.57 (Junction-Case, Tc=25°C, with all circuits operating)	°C/W
Tch	150	°C
Tstg	–40 to +150	°C

* : V_{DD}=25V, L=4.4mH, I_D=7A, unclamped, R_G=50Ω, see Fig. E on page 15.

■Equivalent circuit diagram



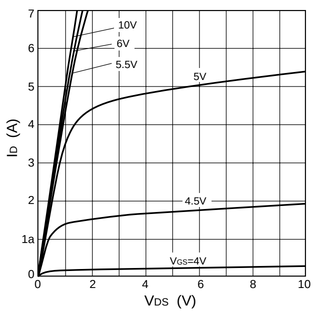
Electrical characteristics

(Ta=25°C)

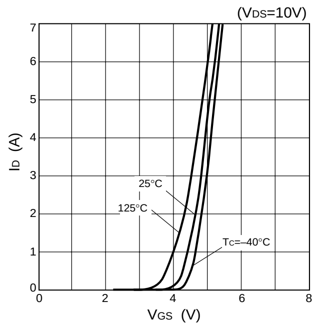
Symbol	Specification min	Specification typ	Specification max	Unit	Conditions
$V_{(BR)DSS}$	250			V	I_D=100μA, V_{GS}=0V
I_{GSS}			±100	nA	V_{GS}=±20V
I_{DSS}			100	μA	V_{DS}=250V, V_{GS}=0V
V_{TH}	2.0		4.0	V	V_{DS}=10V, I_D=1mA
$Re_{(yfs)}$	4.5	6.5		S	V_{DS}=10V, I_D=3.5A
$R_{DS(ON)}$		0.2	0.25	Ω	V_{GS}=10V, I_D=3.5A
Ciss		850		pF	V_{DS}=10V,
Coss		550		pF	f=1.0MHz,
Crss		250		pF	V_{GS}=0V
$t_{d(on)}$		20		ns	I_D=3.5A,
t_r		25		ns	V_{DD}≒100V,
$t_{d(off)}$		90		ns	R_L=28.6Ω, V_{GS}=10V,
t_f		70		ns	see Fig. 3 on page 16.
V_{SD}		1.1	1.5	V	I_{SD}=7A, V_{GS}=0V
t_{rr}		85		ns	I_{SD}=3.5A, V_{GS}=0V, di/dt=100A/μs

Characteristic curves

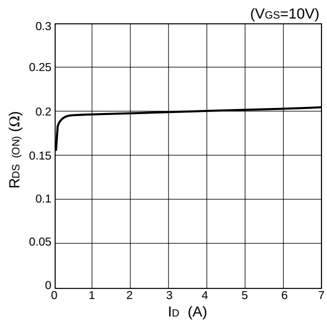
I_D-V_{DS} Characteristics (Typical)



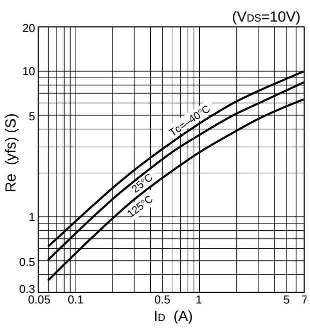
I_D-V_{GS} Characteristics (Typical)



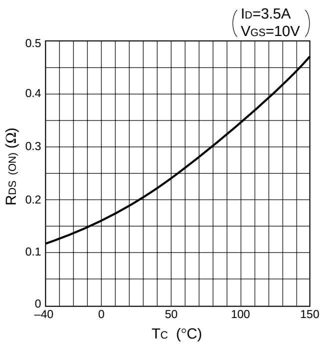
$R_{DS(ON)}$-I_D Characteristics (Typical)



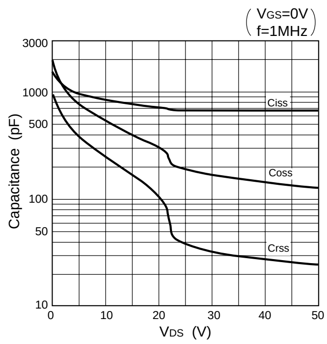
$Re_{(yfs)}$-I_D Characteristics (Typical)



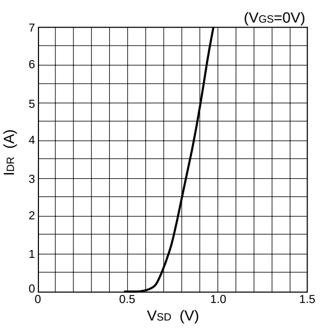
$R_{DS(ON)}$-T_C Characteristics (Typical)



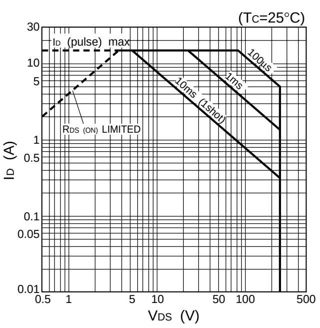
Capacitance-V_{DS} Characteristics (Typical)



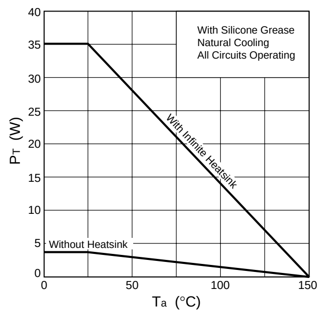
I_{DR}-V_{SD} Characteristics (Typical)



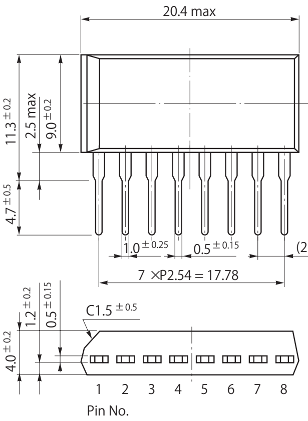
Safe Operating Area (SOA)



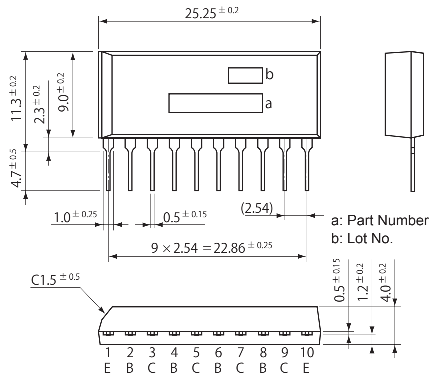
P_T-T_a Characteristics



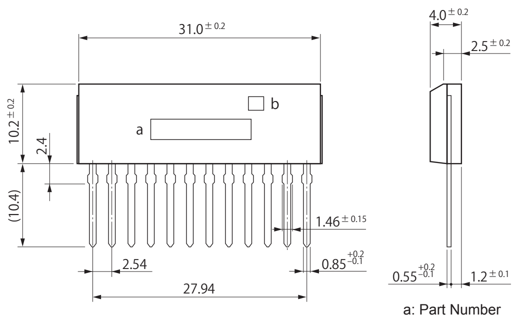
- SIP 8 (STA8Pin)



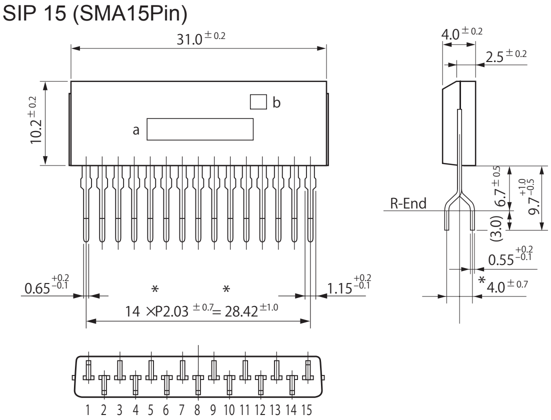
- SIP 10 (STA10Pin)



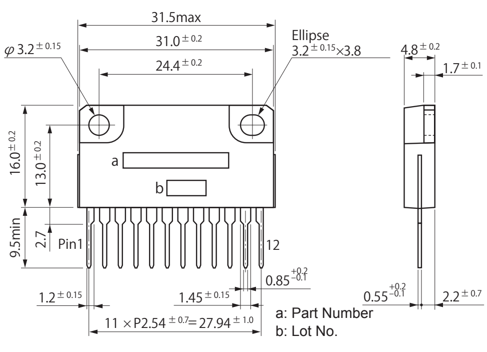
- SIP 12 (SMA12Pin)



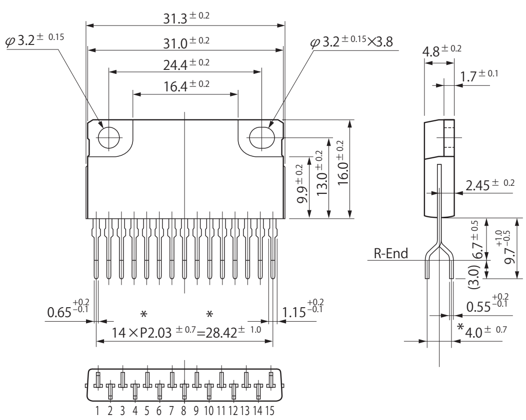
- SIP 15 (SMA15Pin)



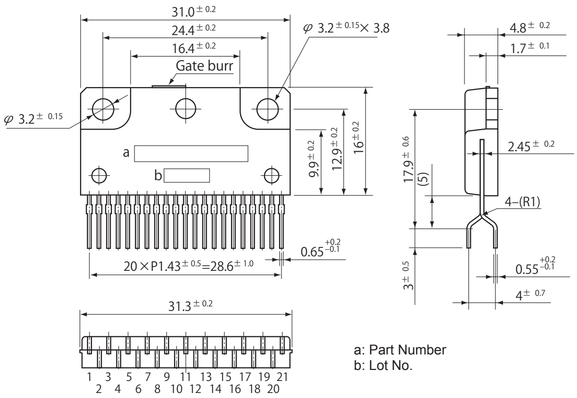
- SIP 12 with Fin (SLA12Pin)



- SIP 15 with Fin (SLA15Pin)



- SIP 21 with Fin (SLA21Pin)



a: Part Number
b: Lot No.

(Unit:mm)