SMA5125

N-channel + P-channel
3-phase motor drive

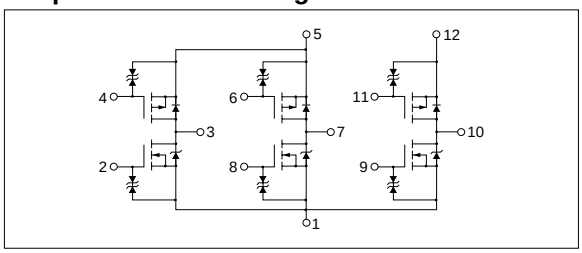
External dimensions Ⓑ ··· SMA

Absolute maximum ratings

(Ta=25°C)

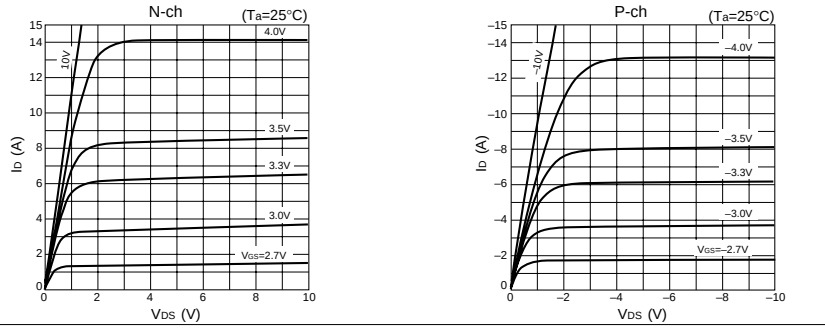
Symbol	Ratings		Unit
	N channel	P channel	
V_{DSS}	60	–60	V
V_{GSS}	±20	±20	V
I_D	10	–10	A
$I_{D(pulse)}$	15 (PW≤1ms, duty≤25%)	–15 (PW≤1ms, duty≤25%)	A
P_T	4 (Ta=25°C, with all circuits operating, without heatsink)		W
	30 (Tc=25°C,with all circuits operating, with infinite heatsink)		W
$\theta_{j\text{-}a}$	31.25 (Junction-Air, Ta=25°C, with all circuits operating)		°C/W
$\theta_{j\text{-}c}$	4.166 (Junction-Case, Tc=25°C, with all circuits operating)		°C/W
Tch	150		°C
Tstg	–40 to +150		°C

■Equivalent circuit diagram

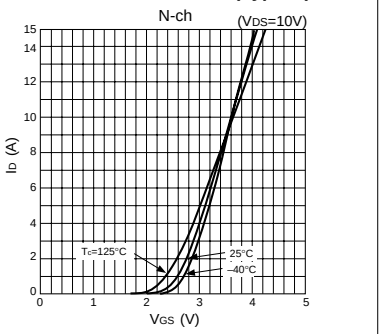


Characteristic curves

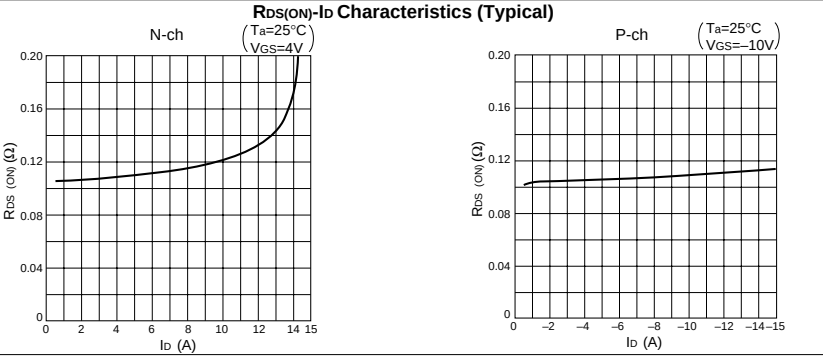
I_D-V_{DS} Characteristics (Typical)



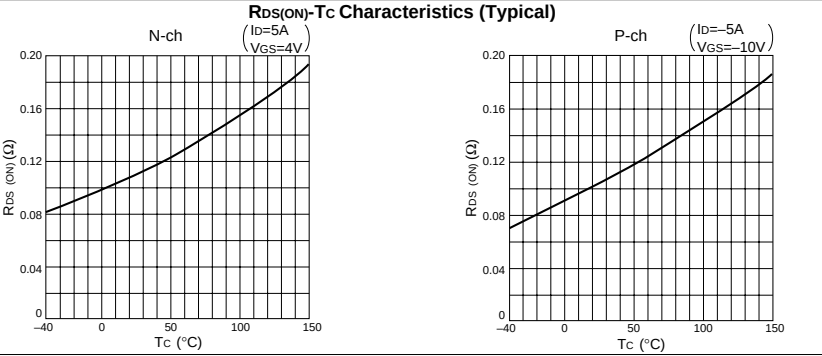
I_D-V_{GS} Characteristics (Typical)



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



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



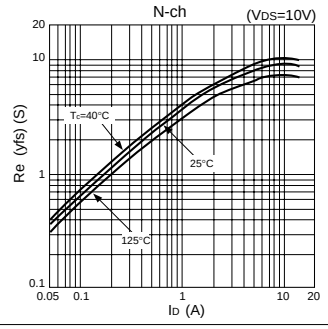
Electrical characteristics

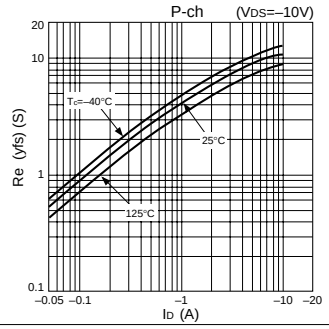
(Ta=25°C)

Symbol	N channel					P channel				
	Specification			Unit	Conditions	Specification			Unit	Conditions
	min	typ	max			min	typ	max		
$V_{(BR)DSS}$	60			V	I_D=100μA, V_{GS}=0V	–60			V	I_D=–100μA, V_{GS}=0V
I_{GSS}			±10	μA	V_{GS}=±20V			±10	μA	V_{GS}=±20V
I_{DSS}			100	μA	V_{DS}=60V, V_{GS}=0V			–100	μA	V_{DS}=–60V, V_{GS}=0V
V_{TH}	1.0		2.0	V	V_{DS}=10V, I_D=250μA	–1.0		–2.0	V	V_{DS}=–10V, I_D=–250μA
$Re_{(yfs)}$		8.0		S	V_{DS}=10V, I_D=5A		8.7		S	V_{DS}=–10V, I_D=–5A
$R_{DS(ON)}$			0.14	Ω	V_{GS}=4V, I_D=5A			0.14	Ω	V_{GS}=–10V, I_D=–5A
Ciss		460		pF	V_{DS}=10V,		1200		pF	V_{DS}=–10V,
Coss		225		pF	f=1.0MHz,		440		pF	f=1.0MHz,
Crss		50		pF	V_{GS}=0V		120		pF	V_{GS}=0V
td (on)		25		ns	I_D=5A, V_{DD}≒20V,		50		ns	I_D=–5A, V_{DD}≒–20V,
tr		110		ns	R_L=4Ω, V_{GS}=5V,		170		ns	R_L=4Ω, V_{GS}=–5V,
td (off)		90		ns	R_G=50Ω,		180		ns	R_G=50Ω,
tf		55		ns	see Fig.3 on page 16.		100		ns	see Fig.4 on page 16.
V_{SD}		1.15		ns	I_{SD}=10A, V_{GS}=0V		–1.25		V	I_{SD}=–10A, V_{GS}=0V
trr		75		V	I_{SD}=5A, di/dt=100A/μs		100		ns	I_{SD}=–5A, di/dt=100A/μs

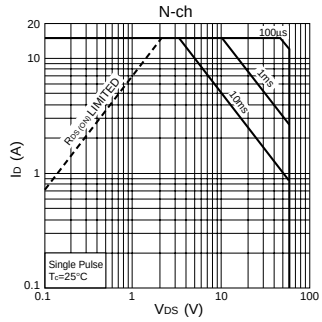
Characteristic curves

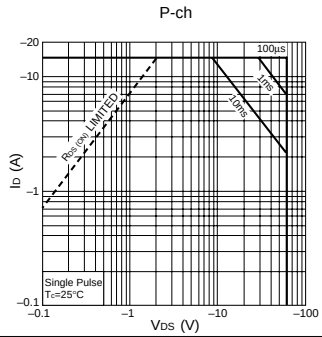
$Re_{(yfs)}$-I_D Characteristics (Typical)



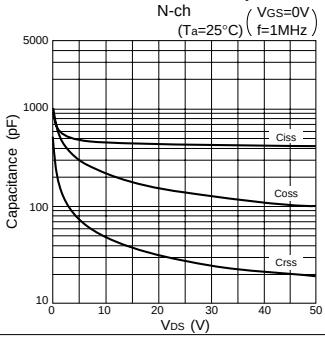


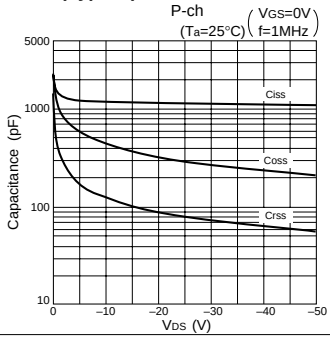
Safe Operating Area (SOA)



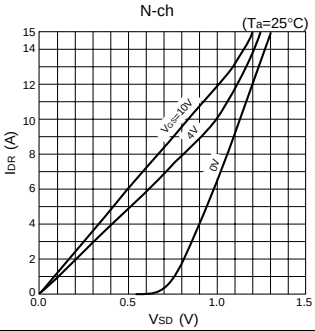


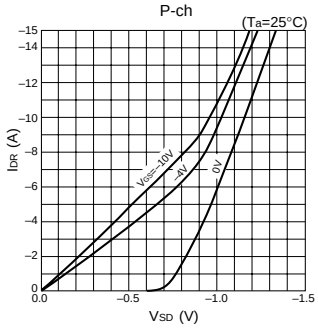
Capacitance-V_{DS} Characteristics (Typical)



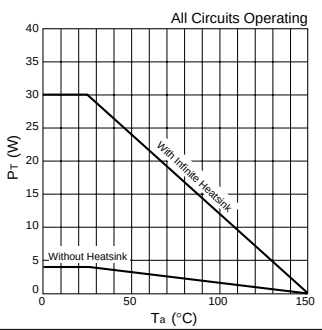


I_{DR}-V_{SD} Characteristics (Typical)

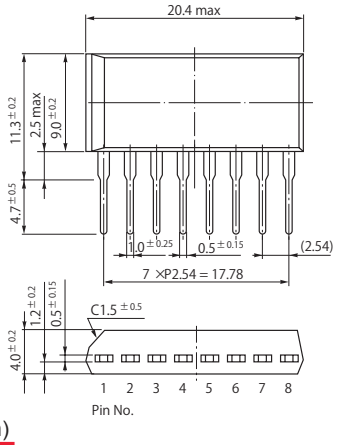




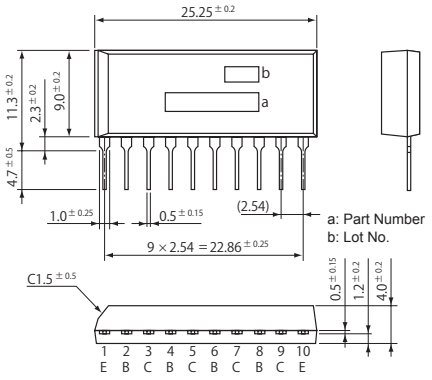
P_T-T_a Characteristics



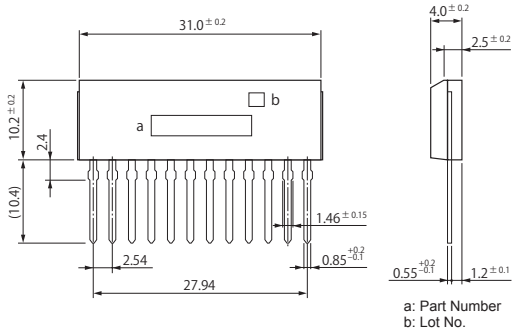
• SIP 8 (STA8Pin)



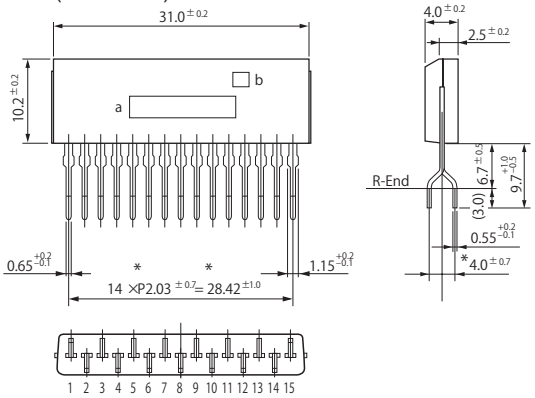
• SIP 10 (STA10Pin)



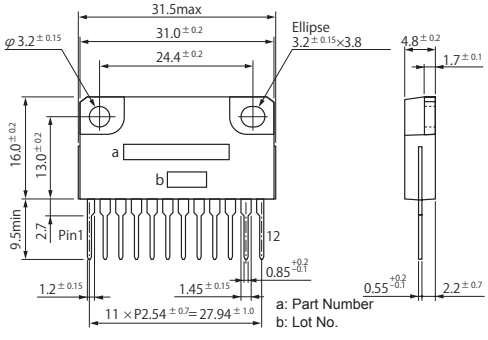
• SIP 12 (SMA12Pin)



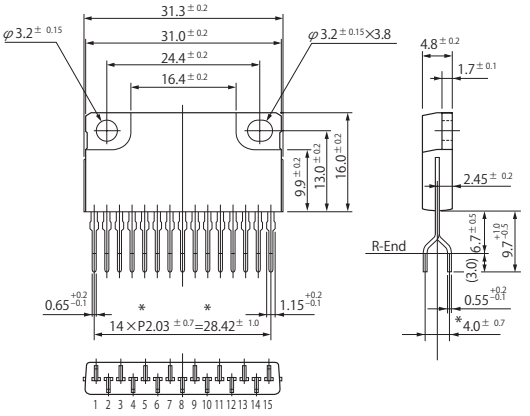
• SIP 15 (SMA15Pin)



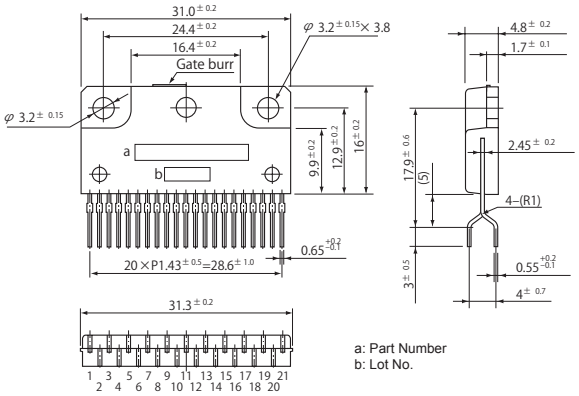
• SIP 12 with Fin (SLA12Pin)



• SIP 15 with Fin (SLA15Pin)



• SIP 21 with Fin (SLA21Pin)



(Unit:mm)

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