



# THE DATASHEET OF SMA5118



## Absolute maximum ratings

( $T_a=25^\circ\text{C}$ )

Symbol	Ratings	Unit
$V_{DSS}$	500	V
$V_{GSS}$	$\pm 30$	V
$I_D$	$\pm 5$	A
$I_D(\text{pulse})$	$\pm 10$ ( $PW \leq 1\text{ms}$ , $D_u \leq 1\%$ )	A
$E_{AS}^*$	45	mJ
$P_T$	4 ( $T_a=25^\circ\text{C}$ , with all circuits operating, without heatsink)	W
	35 ( $T_c=25^\circ\text{C}$ , with all circuits operating, with infinite heatsink)	W
$\theta_{j-a}$	31.2 (Junction-Air, $T_a=25^\circ\text{C}$ , with all circuits operating)	$^\circ\text{C/W}$
$\theta_{j-c}$	3.57 (Junction-Case, $T_c=25^\circ\text{C}$ , with all circuits operating)	$^\circ\text{C/W}$
$T_{ch}$	150	$^\circ\text{C}$
$T_{stg}$	-40 to +150	$^\circ\text{C}$

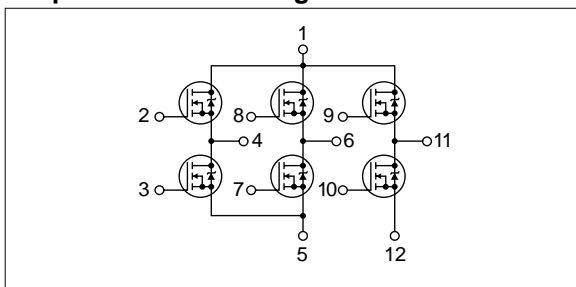
\* :  $V_{DD}=30\text{V}$ ,  $L=3.4\text{mH}$ ,  $I_D=5\text{A}$ , unclamped,  $R_G=50\Omega$ , see Fig. E on page 15.

## Electrical characteristics

( $T_a=25^\circ\text{C}$ )

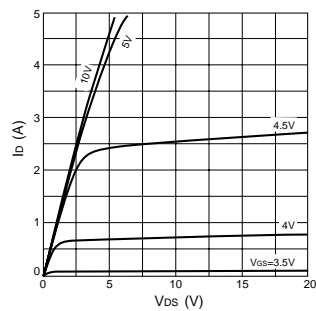
Symbol	Specification			Unit	Conditions
	min	typ	max		
$V_{(BR)DSS}$	500			V	$I_D=100\mu\text{A}$ , $V_{GS}=0\text{V}$
$I_{GSS}$			$\pm 100$	nA	$V_{GS}=\pm 30\text{V}$
$I_{DSS}$			100	$\mu\text{A}$	$V_{DS}=500\text{V}$ , $V_{GS}=0\text{V}$
$V_{TH}$	2.0		4.0	V	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$
$R_{e(yfs)}$	2.4	4.0		S	$V_{DS}=10\text{V}$ , $I_D=2.5\text{A}$
$R_{DS(ON)}$		1.05	1.4	$\Omega$	$V_{GS}=10\text{V}$ , $I_D=2.5\text{A}$
$C_{iss}$		770		pF	$V_{DS}=10\text{V}$ , $f=1.0\text{MHz}$ , $V_{GS}=0\text{V}$
$C_{oss}$		290		pF	
$t_{d(on)}$		20		ns	$I_D=2.5\text{A}$ , $V_{DD} \approx 200\text{V}$ , $R_L=80\Omega$ , $V_{GS}=10\text{V}$ , see Fig. 3 on page 16.
$t_r$		25		ns	
$t_{d(off)}$		70		ns	
$t_f$		65		ns	
$V_{SD}$		1.1	1.5	V	
$t_{rr}$		75		ns	$I_{SD}=2.5\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$

## Equivalent circuit diagram

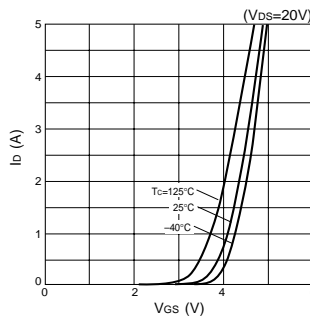


## Characteristic curves

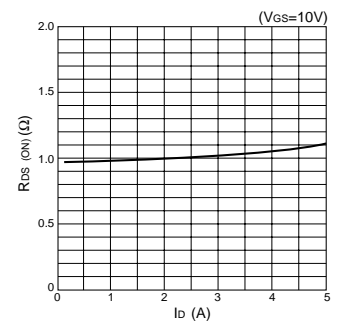
$I_D$ - $V_{DS}$  Characteristics (Typical)



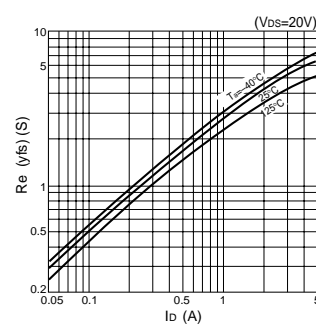
$I_D$ - $V_{GS}$  Characteristics (Typical)



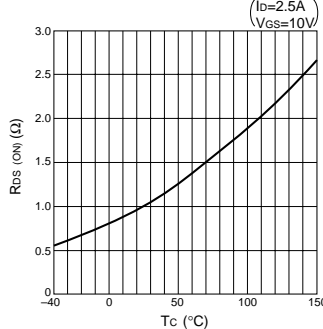
$R_{DS(ON)}$ - $I_D$  Characteristics (Typical)



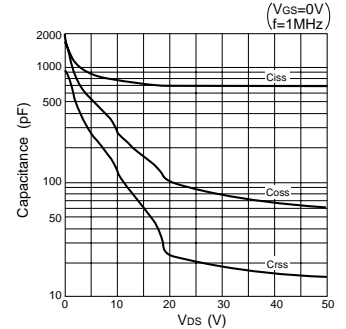
$R_{e(yfs)}$ - $I_D$  Characteristics (Typical)



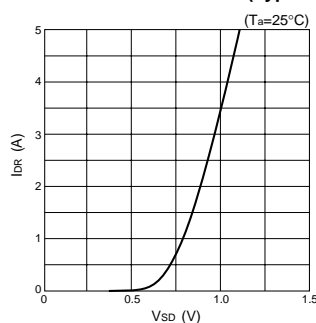
$R_{DS(ON)}$ - $T_C$  Characteristics (Typical)



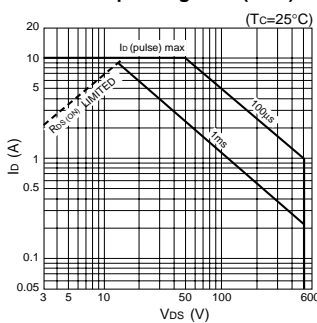
Capacitance- $V_{DS}$  Characteristics (Typical)



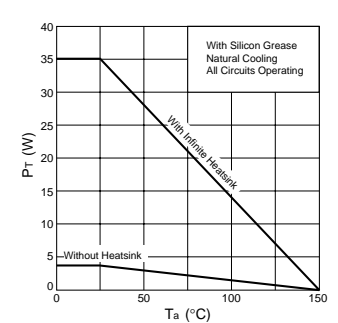
$I_{DR}$ - $V_{SD}$  Characteristics (Typical)



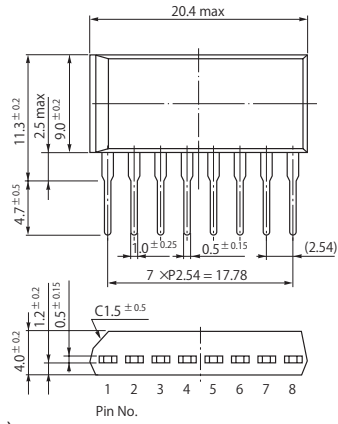
Safe Operating Area (SOA)



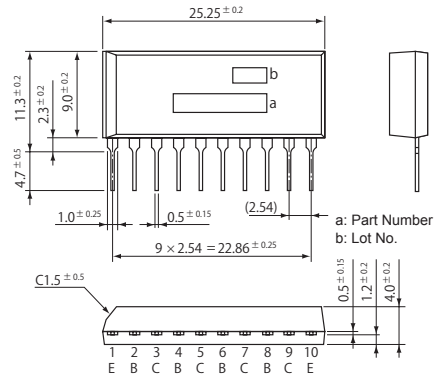
$P_T$ - $T_a$  Characteristics



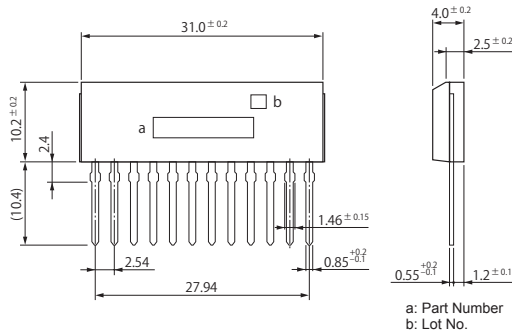
• SIP 8 (STA8Pin)



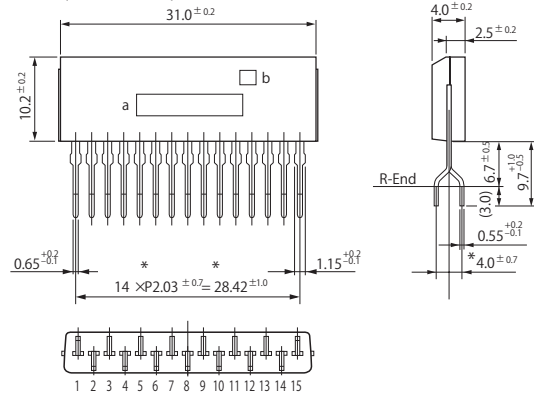
• SIP 10 (STA10Pin)



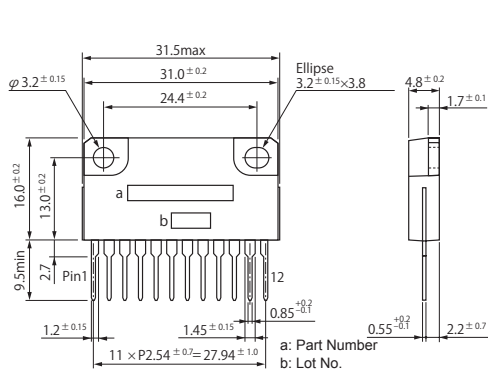
• SIP 12 (SMA12Pin)



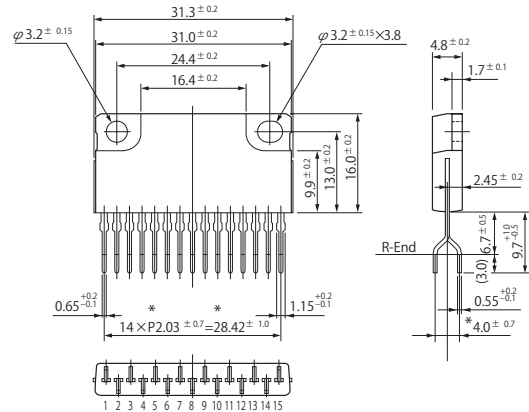
• SIP 15 (SMA15Pin)



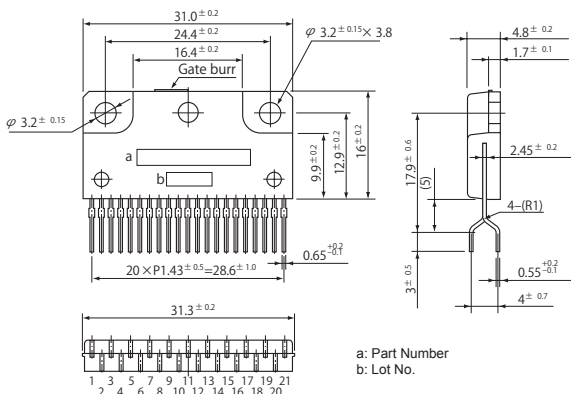
• SIP 12 with Fin (SLA12Pin)



• SIP 15 with Fin (SLA15Pin)





• SIP 21 with Fin (SLA21Pin)



(Unit:mm)

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