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SMA5125

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

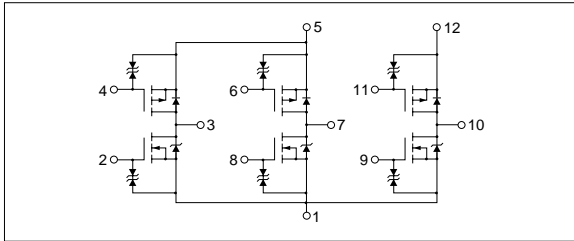
External dimensions SMA

Absolute maximum ratings

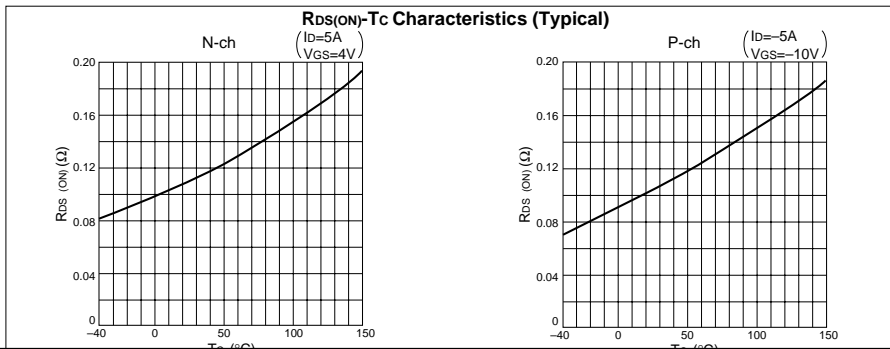
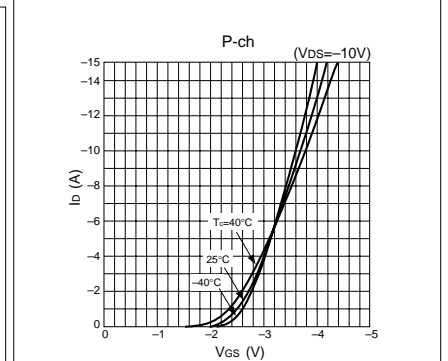
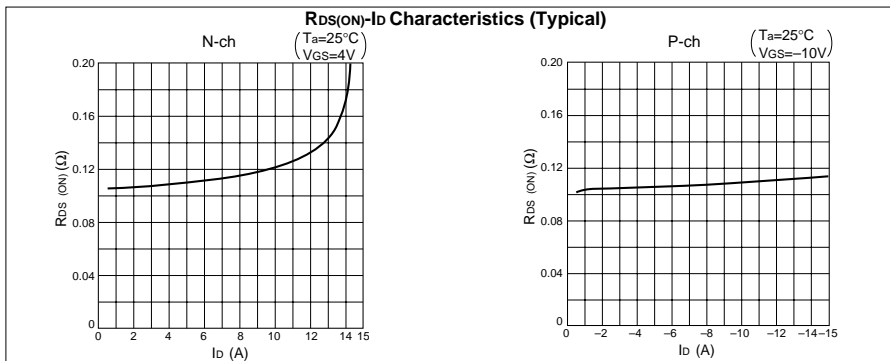
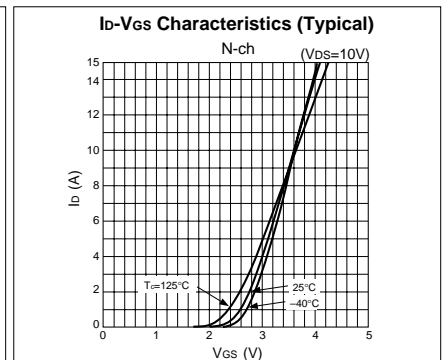
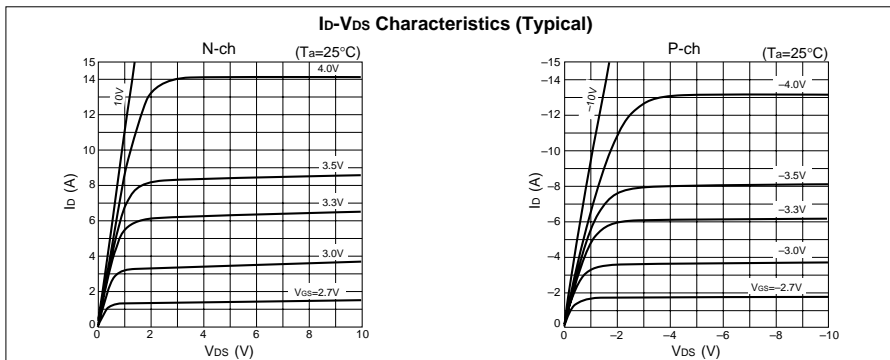
($T_a=25^\circ\text{C}$)

Symbol	Ratings		Unit
	N channel	P channel	
V_{DSS}	60	-60	V
V_{GSS}	± 20	± 20	V
I_D	10	-10	A
$I_D(\text{pulse})$	15 (PW \leq 1ms, duty \leq 25%)	-15 (PW \leq 1ms, duty \leq 25%)	A
P_T	4 ($T_a=25^\circ\text{C}$, with all circuits operating, without heatsink)		W
	30 ($T_c=25^\circ\text{C}$, with all circuits operating, with infinite heatsink)		W
θ_{j-a}	31.25 (Junction-Air, $T_a=25^\circ\text{C}$, with all circuits operating)		$^\circ\text{C/W}$
θ_{j-c}	4.166 (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		$^\circ\text{C}$

Equivalent circuit diagram



Characteristic curves



SMA5125

Electrical characteristics

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

Symbol	N channel					P channel				
	Specification			Unit	Conditions	Specification			Unit	Conditions
	min	typ	max			min	typ	max		
$V_{(BR)DSS}$	60			V	$I_D=100\mu\text{A}, V_{GS}=0\text{V}$	-60			V	$I_D=-100\mu\text{A}, V_{GS}=0\text{V}$
I_{GSS}			± 10	μA	$V_{GS}=\pm 20\text{V}$			± 10	μA	$V_{GS}=\pm 20\text{V}$
I_{DSS}			100	μA	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$			-100	μA	$V_{DS}=-60\text{V}, V_{GS}=0\text{V}$
V_{TH}	1.0		2.0	V	$V_{DS}=10\text{V}, I_D=250\mu\text{A}$	-1.0		-2.0	V	$V_{DS}=-10\text{V}, I_D=-250\mu\text{A}$
$R_{e(yfs)}$		8.0		S	$V_{DS}=10\text{V}, I_D=5\text{A}$		8.7		S	$V_{DS}=-10\text{V}, I_D=-5\text{A}$
$R_{DS(ON)}$			0.14	Ω	$V_{GS}=4\text{V}, I_D=5\text{A}$			0.14	Ω	$V_{GS}=-10\text{V}, I_D=-5\text{A}$
C_{iss}		460		pF	$V_{DS}=10\text{V},$ $f=1.0\text{MHz},$ $V_{GS}=0\text{V}$		1200		pF	$V_{DS}=-10\text{V},$ $f=1.0\text{MHz},$ $V_{GS}=0\text{V}$
C_{oss}		225		pF			440		pF	
C_{rss}		50		pF			120		pF	
$t_{d(on)}$		25		ns	$I_D=5\text{A}, V_{DD} \approx 20\text{V},$ $R_L=4\Omega, V_{GS}=5\text{V},$ $R_G=50\Omega,$		50		ns	$I_D=-5\text{A}, V_{DD} \approx -20\text{V},$ $R_L=4\Omega, V_{GS}=-5\text{V},$ $R_G=50\Omega,$
t_r		110		ns			170		ns	
$t_{d(off)}$		90		ns			180		ns	
t_f		55		ns	see Fig.3 on page 16.		100		ns	see Fig.4 on page 16.
V_{SD}		1.15		ns	$I_{SD}=10\text{A}, V_{GS}=0\text{V}$		-1.25		V	$I_{SD}=-10\text{A}, V_{GS}=0\text{V}$
t_{rr}		75		V	$I_{SD}=5\text{A}, di/dt=100\text{A}/\mu\text{s}$		100		ns	$I_{SD}=-5\text{A}, di/dt=100\text{A}/\mu\text{s}$

Characteristic curves

