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Sanken
SMA5127

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SMA5127

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

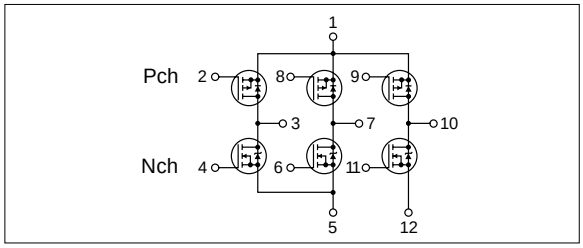
External dimensions Ⓑ ··· SMA

Absolute maximum ratings

(Ta=25°C)

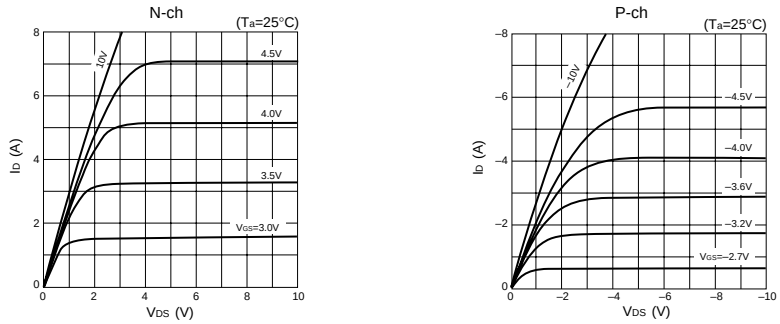
Symbol	Ratings		Unit
	N channel	P channel	
V_{DSS}	60	–60	V
V_{GSS}	±20	∓20	V
I_D	4	–4	A
$I_{D(pulse)}$	8 (PW≤1ms, Duty≤1%)	–8 (PW≤1ms, Duty≤1%)	A
P_T	4 (Ta=25°C, with all circuits operating, without heatsink)		W
	28 (Tc=25°C,with all circuits operating, with infinite heatsink)		W
$\theta_{j\text{-}a}$	31.25 (Junction-Air, Ta=25°C, with all circuits operating)		°C/W
$\theta_{j\text{-}c}$	4.46 (Junction-Case, Tc=25°C, with all circuits operating)		°C/W
Tch	150		°C
Tstg	–40 to +150		°C

■Equivalent circuit diagram

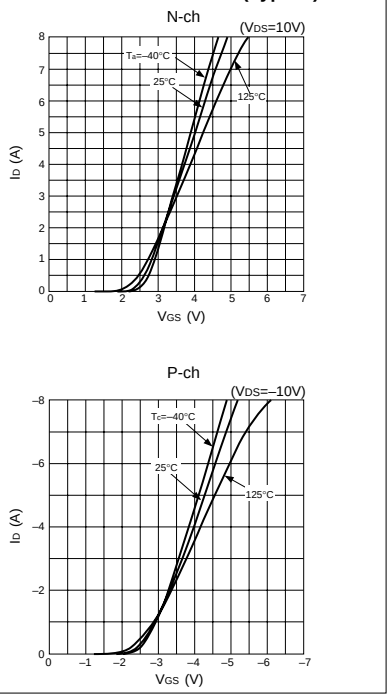


Characteristic curves

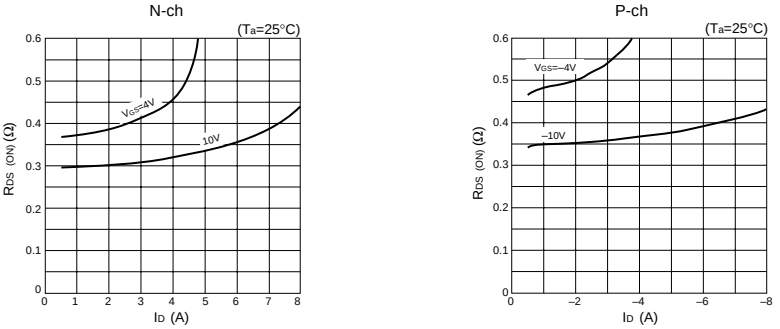
ID-VDS Characteristics (Typical)



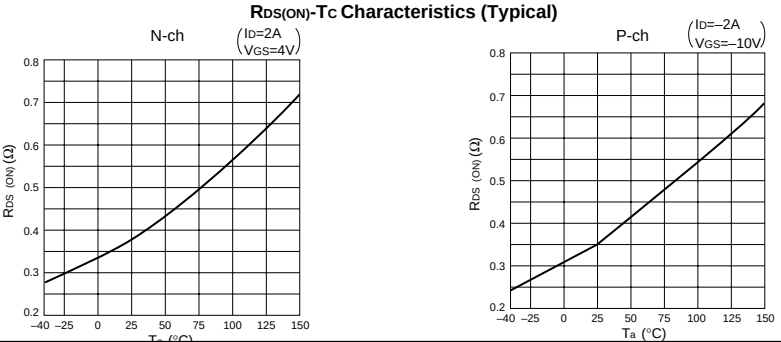
ID-VGS Characteristics (Typical)



RDS(ON)-ID Characteristics (Typical)



RDS(ON)-Tc Characteristics (Typical)



SMA5127

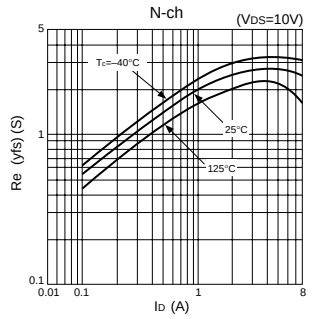
Electrical characteristics

(Ta=25°C)

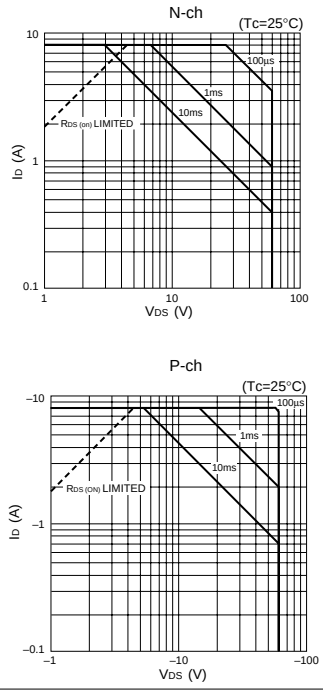
Symbol	N channel					P channel				
	Specification			Unit	Conditions	Specification			Unit	Conditions
	min	typ	max			min	typ	max		
$V_{(BR)DSS}$	60			V	I_D=100μA, V_{GS}=0V	–60			V	I_D=–100μA, V_{GS}=0V
I_{GSS}			±10	μA	V_{GS}=±20V			∓10	μA	V_{GS}=∓20V
I_{DSS}			100	μA	V_{DS}=60V, V_{GS}=0V			–100	μA	V_{DS}=–60V, 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
$Re_{(yfs)}$		2.5		S	V_{DS}=10V, I_D=2A		3		S	V_{DS}=–10V, I_D=–2A
$R_{DS(ON)}$			0.55	Ω	V_{GS}=4V, I_D=2A			0.55	Ω	V_{GS}=–10V, I_D=–2A
Ciss		150		pF	V_{DS}=10V		320		pF	V_{DS}=–10V,
Coss		70		pF	f=1.0MHz		130		pF	f=1.0MHz,
Crss		15		pF	V_{GS}=0V		40		pF	V_{GS}=0V
td (on)		12		ns	I_D=2A, V_{DD}≒20V,		20		ns	I_D=–2A, V_{DD}≒–20V,
tr		40		ns	R_L=10Ω, V_{GS}=5V,		95		ns	R_L=10Ω, V_{GS}=–5V,
td (off)		40		ns	see Fig.3 on page 16.		70		ns	see Fig.4 on page 16.
tf		25		ns			60		ns	
V_{SD}		1.2		V	I_{SD}=4A, V_{GS}=0V		–1.1		V	I_{SD}=–4A, V_{GS}=0V
trr		75		ns	I_{SD}=2A, V_{GS}=0V, di/dt=100A/μs		75		ns	I_{SD}=–2A, V_{GS}=0V, di/dt=100A/μs

Characteristic curves

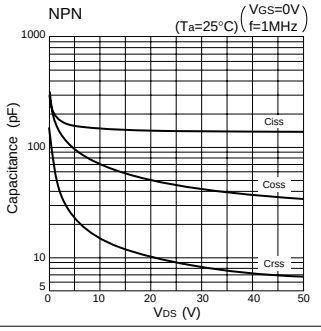
$Re_{(yfs)}$-I_D Characteristics (Typical)



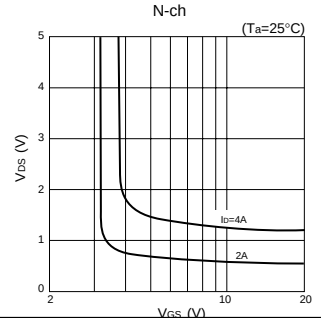
Safe Operating Area (SOA)



Capacitance-V_{DS} Characteristics (Typical)



V_{DS}-V_{GS} Characteristics (Typical)



P_T-T_a Characteristics