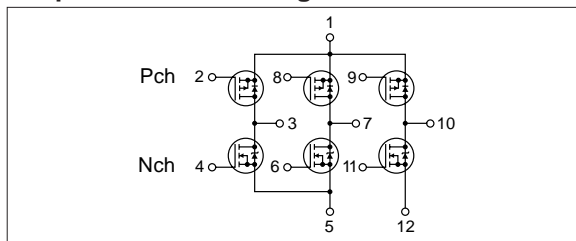# SMA5127
N-channel + P-channel
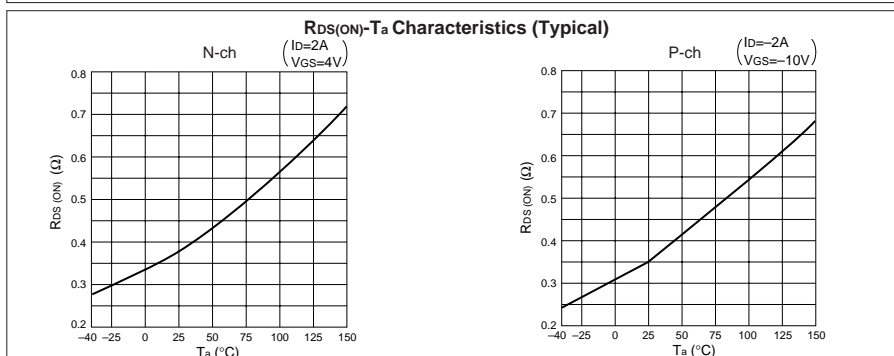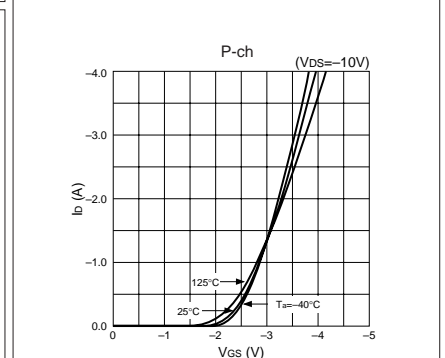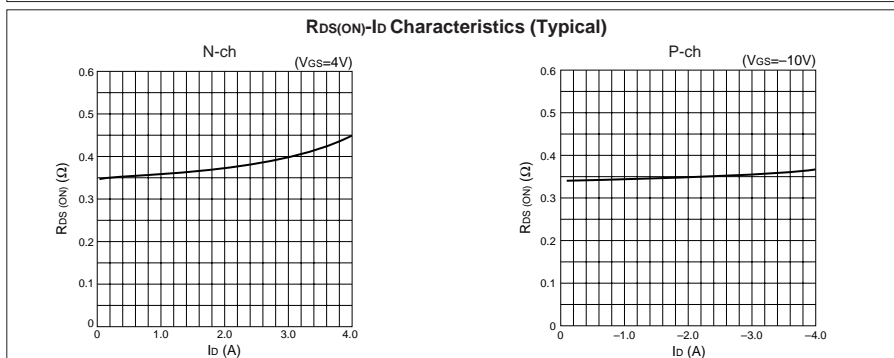**3-phase motor drive**
External dimensions Ⓑ⋯SMA

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 ━

I_D-V_{DS} Characteristics (Typical)

I_D-V_{GS} Characteristics (Typical)

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

$R_{DS(ON)}$-T_a Characteristics (Typical)
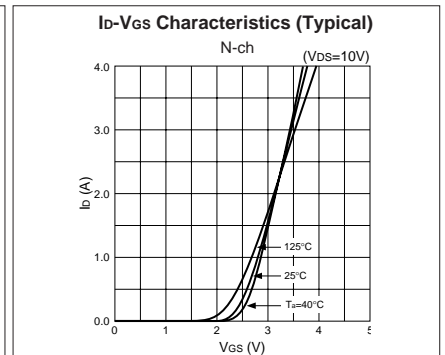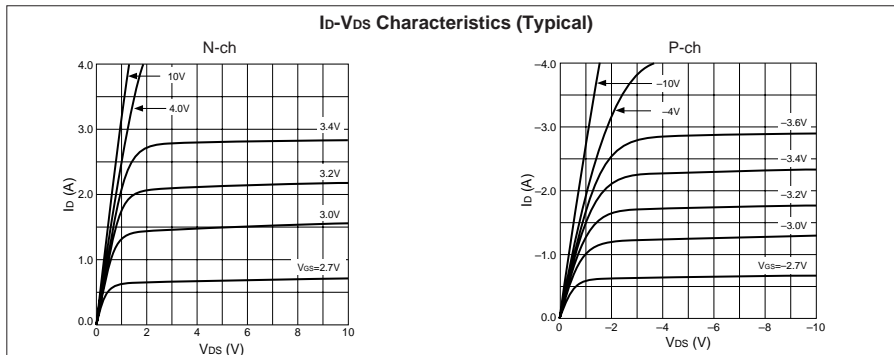
Electrical characteristics

<div align="right">(Ta=25°C)</div>

Symbol	N channel					P channel				
	Specification			Unit	Conditions	Specification			Unit	Conditions
	min	typ	max			min	typ	max		
V(BR)DSS	60			V	ID=100μA, VGS=0V	−60			V	ID=−100μA, VGS=0V
IGSS			±10	μA	VGS=±20V			∓10	μA	VGS=∓20V
IDSS			100	μA	VDS=60V, VGS=0V			−100	μA	VDS=−60V, VGS=0V
VTH	1.0		2.0	V	VDS=10V, ID=250μA	−1.0		−2.0	V	VDS=−10V, ID=−250μA
Re(yfs)		2.5		S	VDS=10V, ID=2A		3		S	VDS=−10V, ID=−2A
RDS(ON)			0.55	Ω	VGS=4V, ID=2A			0.55	Ω	VGS=−10V, ID=−2A
Ciss		150		pF	VDS=10V, f=1.0MHz, VGS=0V		320		pF	VDS=−10V, f=1.0MHz, VGS=0V
Coss		70		pF			130		pF	
Crss		15		pF			40		pF	
td(on)		12		ns	ID=2A, VDD≒20V, RL=10Ω, VGS=5V see Fig. 3 on page 16.		20		ns	ID=−2A, VDD≒−20V, RL=10Ω, VGS=−5V see Fig. 4 on page 16.
tr		40		ns			95		ns	
td(off)		40		ns			70		ns	
tf		25		ns			60		ns	
VSD		1.2		V	ISD=5A, VGS=0V		1.1		V	ISD=−4A, VGS=0V
trr		75		ns	ISD=2A, VGS=0V di/dt=100A/μs		75		ns	ISD=−2A, VGS=0V di/dt=100A/μs

▆ Characteristic curves ▆

Re(yfs)-ID Characteristics (Typical)

N-ch (VDS=10V)

P-ch (VDS=−10V)

Safe Operating Area (SOA)

N-ch (Tc=25°C)

P-ch (Tc=25°C)

Capacitance-VDS Characteristics (Typical)

N-ch (VGS=0V, f=1MHz)

P-ch (VGS=0V, f=1MHz)

IDR-VSD Characteristics (Typical)

N-ch

P-ch

PT-Ta Characteristics

With Silicone Grease Natural Cooling All Circuits Operating