Ordering number : ENA0705

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

MCH6428 — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 1.8V drive.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	20	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1200mm²×0.8mm)	1.5	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	0.4		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=3A	2.8	4.7		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=3A, V_{GS}=4V		38	50	mΩ
	R_{DS}(on)2	I_D=1.5A, V_{GS}=2.5V		50	70	mΩ
	R_{DS}(on)3	I_D=0.5A, V_{GS}=1.8V		70	110	mΩ

Marking : ZC

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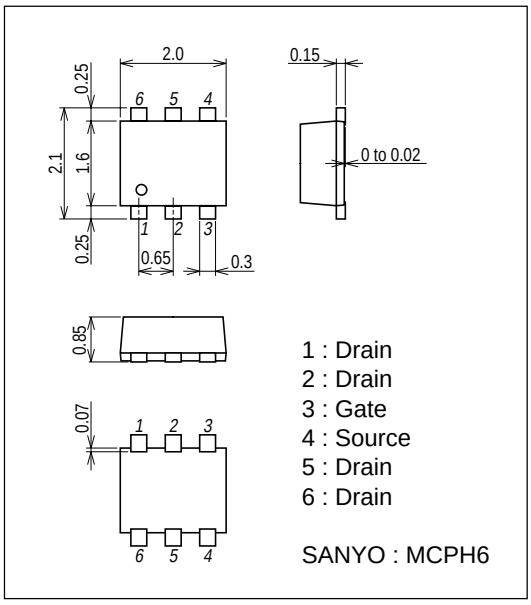
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		340		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		85		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		65		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		10		ns
Rise Time	t_{r}	See specified Test Circuit.		88		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		30		ns
Fall Time	t_{f}	See specified Test Circuit.		61		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4V, I_{D}=5A		4.4		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=4V, I_{D}=5A		0.92		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=4V, I_{D}=5A		1.35		nC
Diode Forward Voltage	V_{SD}	I_{S}=5A, V_{GS}=0V		0.85	1.2	V

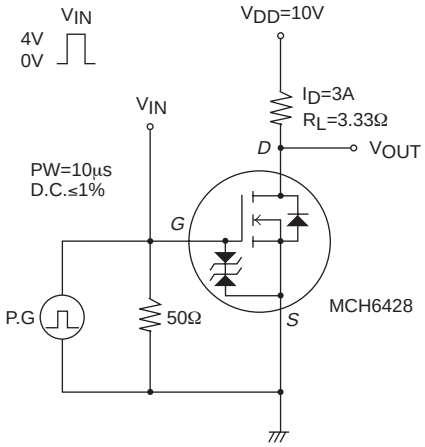
Package Dimensions

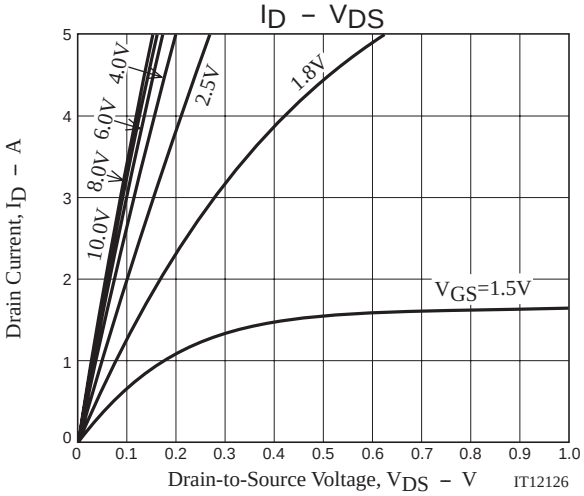
unit : mm (typ)

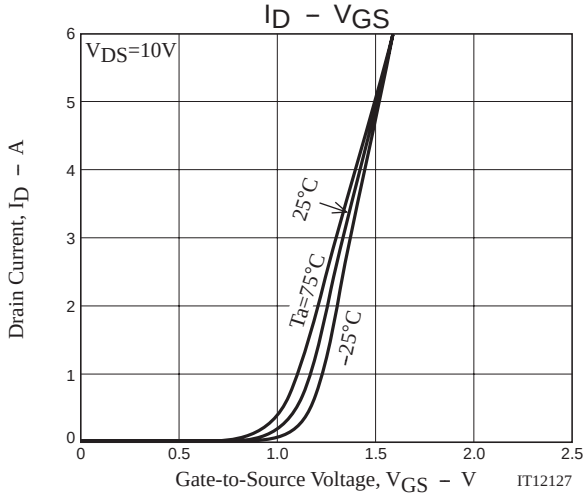
7022A-009

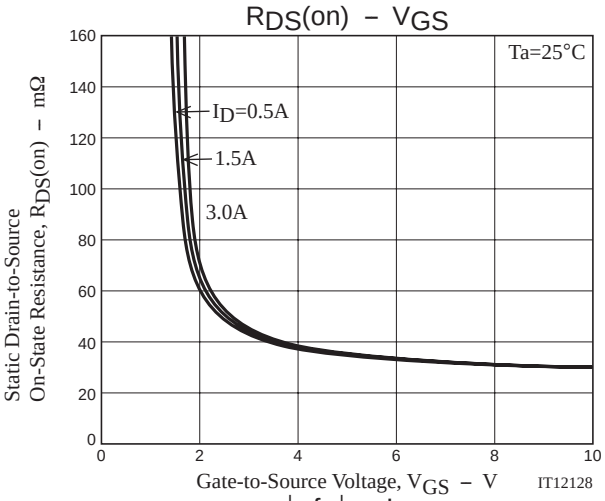


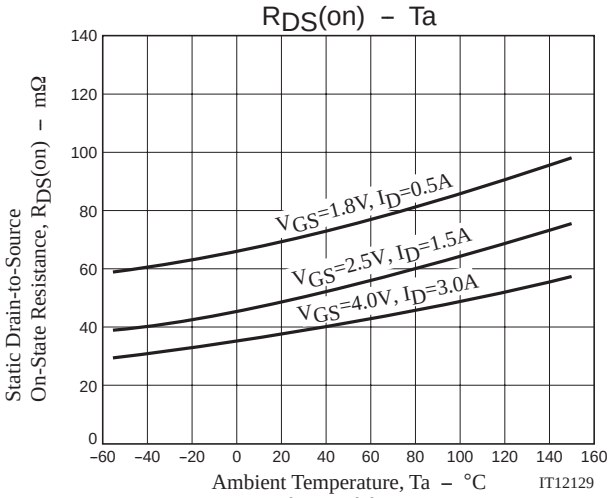
Switching Time Test Circuit

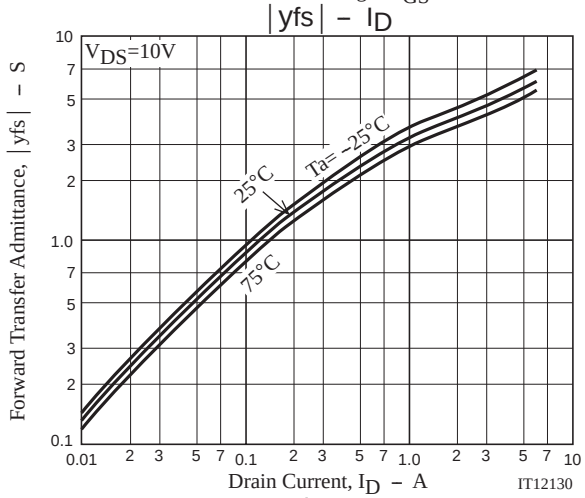


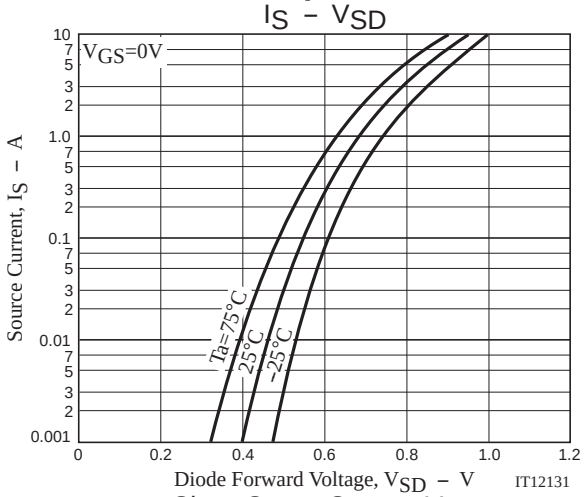


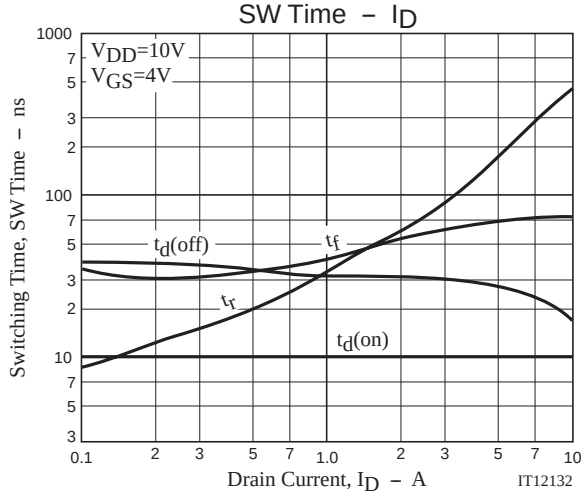


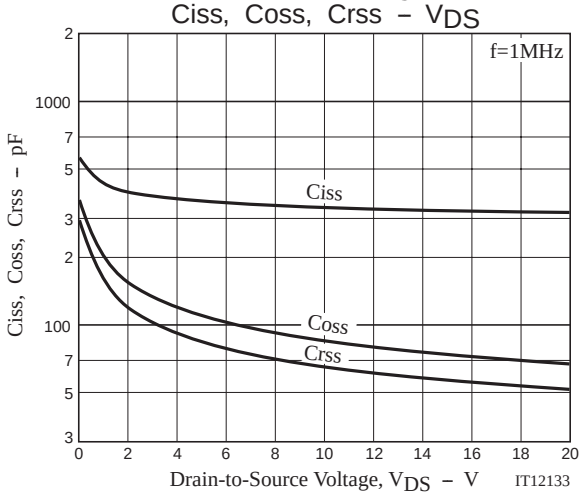

RDS(on) – VGS
Ta=25°C
ID=0.5A
1.5A
3.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT12128

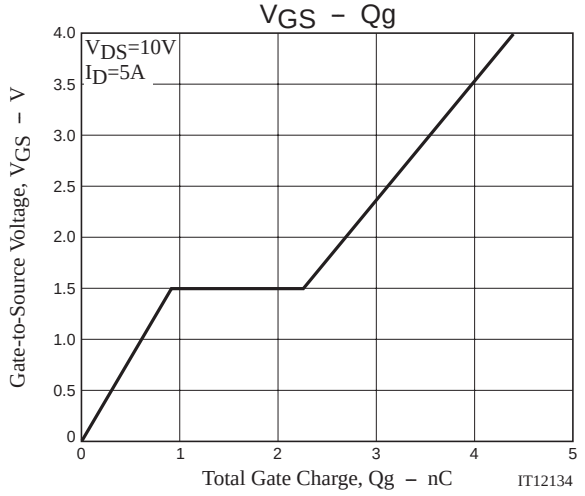

RDS(on) – Ta
VGS=1.8V, ID=0.5A
VGS=2.5V, ID=1.5A
VGS=4.0V, ID=3.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT12129

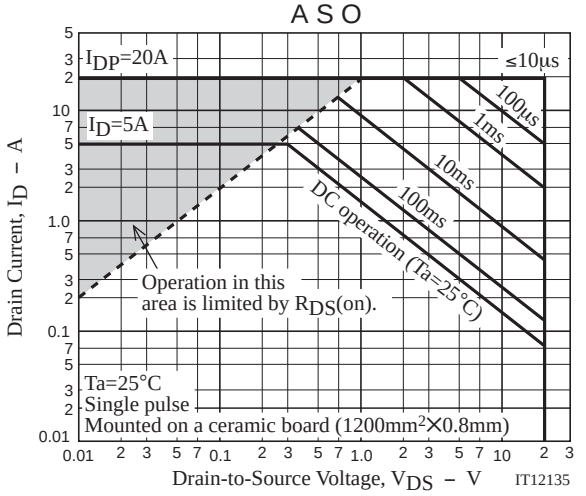

|yfs| – ID
VDS=10V
Ta=–25°C
25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT12130

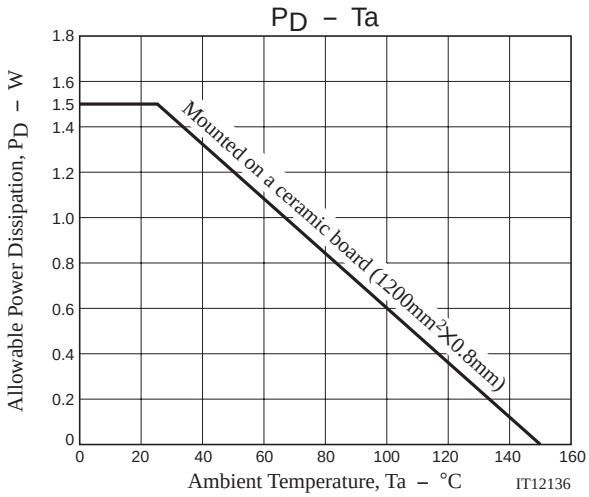

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT12131


SW Time – ID
VDD=10V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT12132


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT12133


VGS – Qg
VDS=10V
ID=5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT12134


A S O
IDP=20A
ID=5A
≤10μs
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (1200mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT12135



Note on usage : Since the MCH6428 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.