Ordering number : ENA1566

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

MCH6445 — General-Purpose Switching Device Applications

Features

- 4V drive.
- Low ON-resistance.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	16	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (1500mm^2×0.8mm)	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	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=2A		3		S

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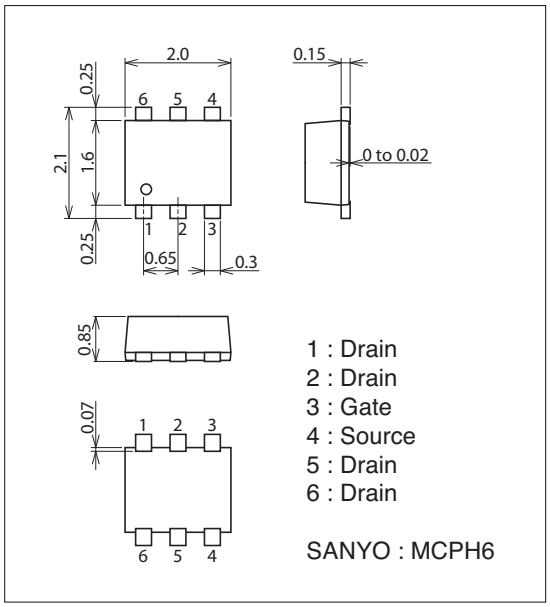
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=2A, V_{GS}=10V		60	78	mΩ
	$R_{DS}(on)2$	I_D=1A, V_{GS}=4.5V		74	104	mΩ
	$R_{DS}(on)3$	I_D=1A, V_{GS}=4V		81	114	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		505		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		57		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		37		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		7.3		ns
Rise Time	t_r	See specified Test Circuit.		9.8		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		40		ns
Fall Time	t_f	See specified Test Circuit.		24		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=4A		10		nC
Gate-to-Source Charge	Qgs	V_{DS}=30V, V_{GS}=10V, I_D=4A		1.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=30V, V_{GS}=10V, I_D=4A		2.1		nC
Diode Forward Voltage	V_{SD}	I_S=4A, V_{GS}=0V		0.82	1.2	V

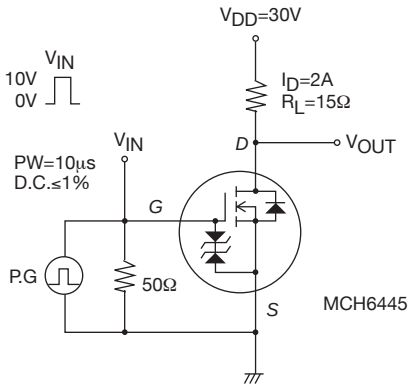
Package Dimensions

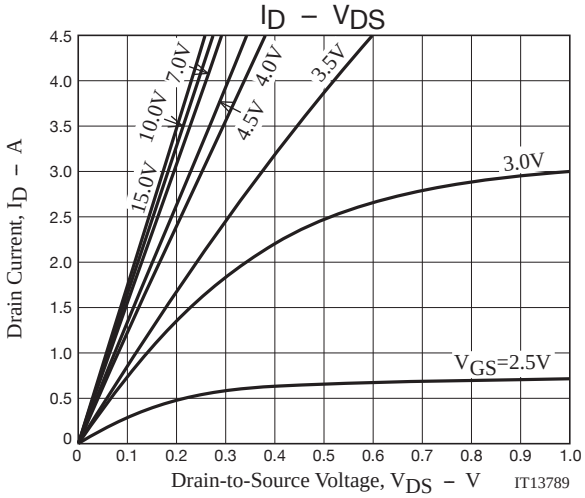
unit : mm (typ)

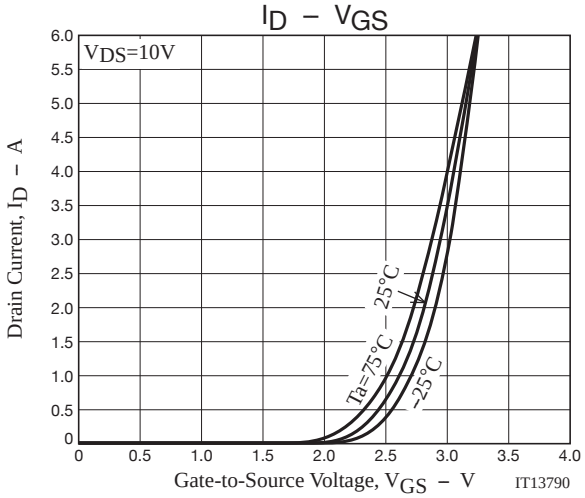
7022A-009

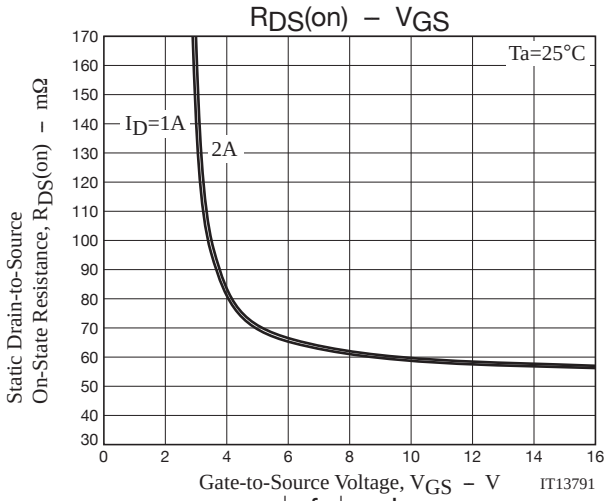


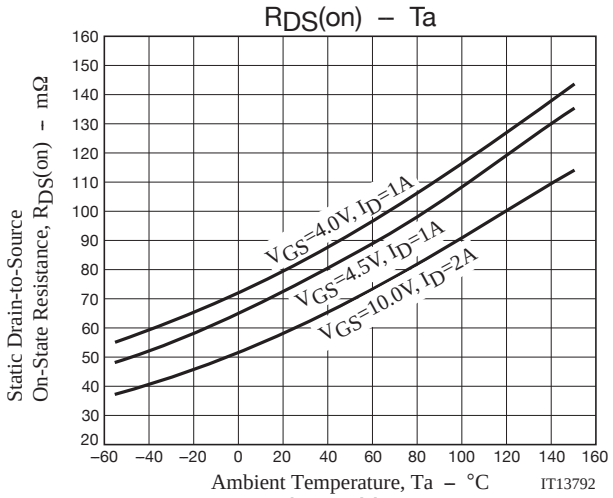
Switching Time Test Circuit

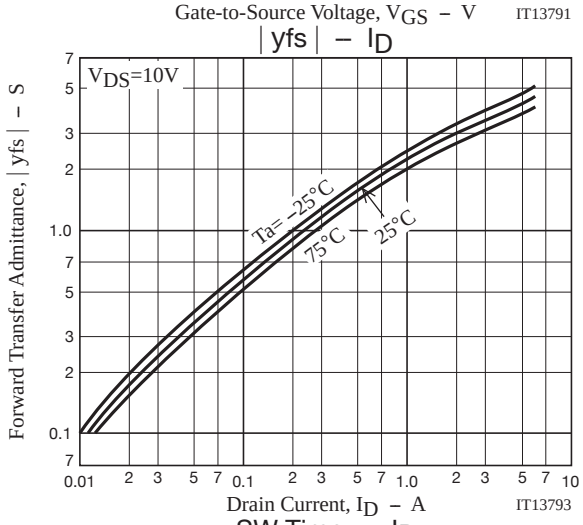


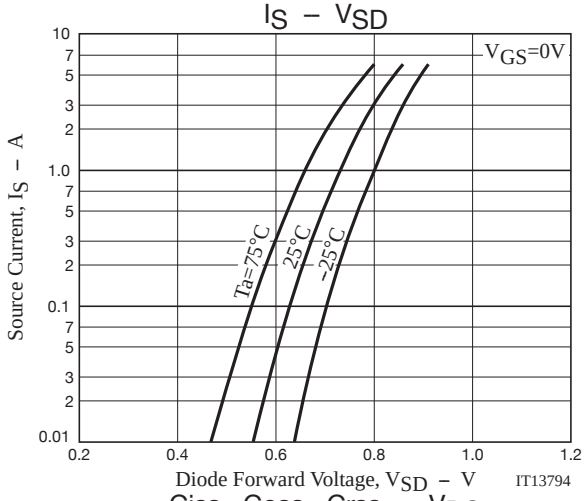


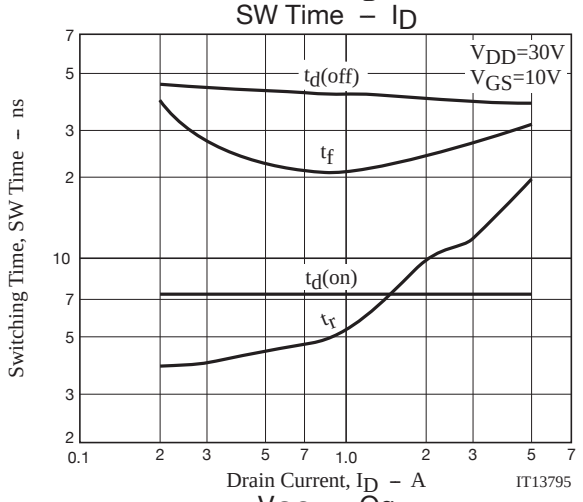


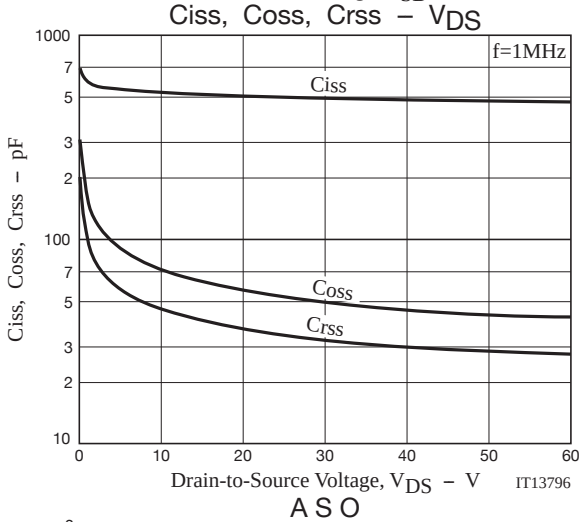

RDS(on) – VGS
Ta=25°C
ID=1A
2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT13791

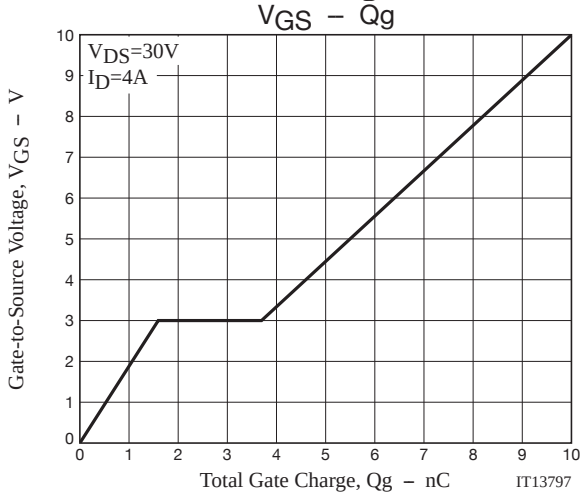

RDS(on) – Ta
VGS=4.0V, ID=1A
VGS=4.5V, ID=1A
VGS=10.0V, ID=2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT13792

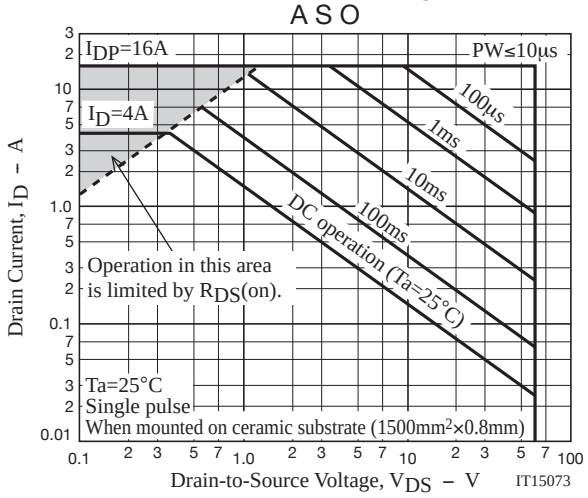

| yfs | – ID
VDS=10V
Ta=–25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT13793

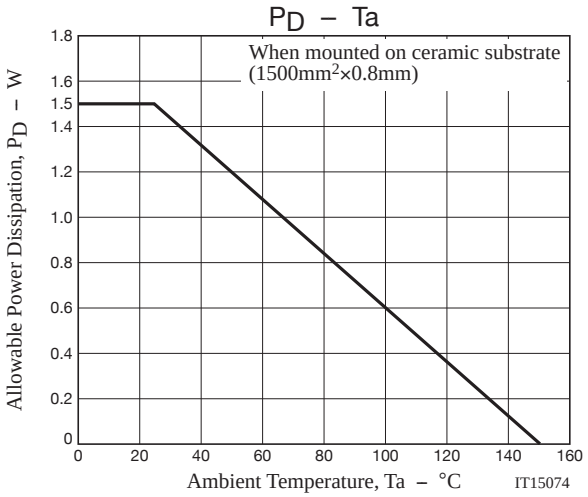

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13794


SW Time – ID
VDD=30V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT13795


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13796


VGS – Qg
VDS=30V
ID=4A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13797


A S O
IDP=16A
PW≤10μs
ID=4A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (1500mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15073



Note on usage : Since the MCH6445 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.