Ordering number : ENA1202A

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

MCH6440 — General-Purpose Switching Device Applications

Features

- 1.5V drive.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		55	V
Gate-to-Source Voltage *1	V_{GSS}		10	V
Drain Current (DC)	I_D		0.6	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	2.4	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (2000mm²×0.8mm)	1.5	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

*1 Note, when designing a circuit using this product, that it has a gate (oxide film) protection diode connected only between its gate and source.

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	55			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=55V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=8V, V_{DS}=0V			1	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=100μA	0.4		1.3	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=300mA	420	700		mS
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=300mA, V_{GS}=4V		2.0	2.7	Ω
	R_{DS}(on)2	I_D=150mA, V_{GS}=2.5V		2.1	3.0	Ω
	R_{DS}(on)3	I_D=10mA, V_{GS}=1.5V		3.0	6.0	Ω

Marking : ZP

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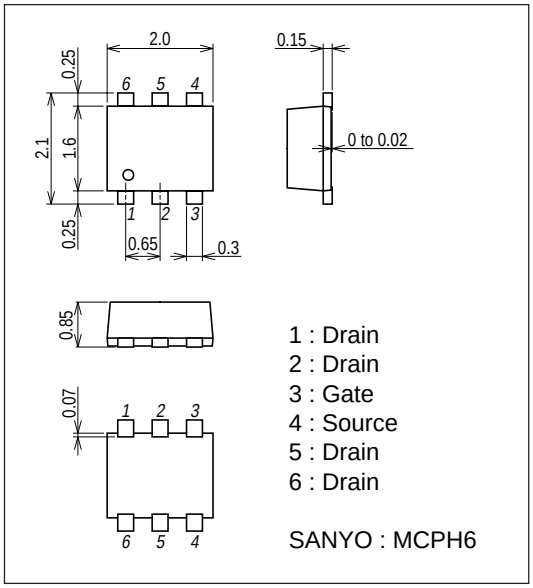
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		30		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		6.1		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		3.9		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		4.1		ns
Rise Time	t_{r}	See specified Test Circuit.		5.6		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		8.6		ns
Fall Time	t_{f}	See specified Test Circuit.		8.4		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=4V, I_{D}=600mA		0.87		nC
Gate-to-Source Charge	Qgs	V_{DS}=30V, V_{GS}=4V, I_{D}=600mA		0.12		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=30V, V_{GS}=4V, I_{D}=600mA		0.37		nC
Diode Forward Voltage	V_{SD}	I_{S}=600mA, V_{GS}=0V		0.94	1.2	V

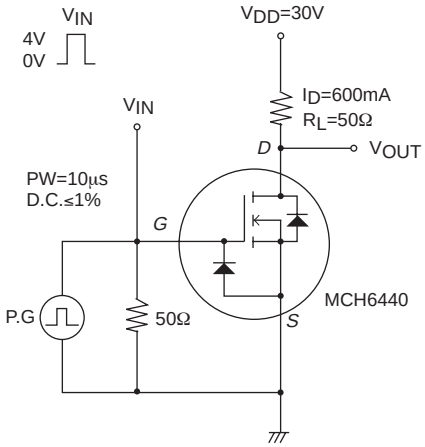
Package Dimensions

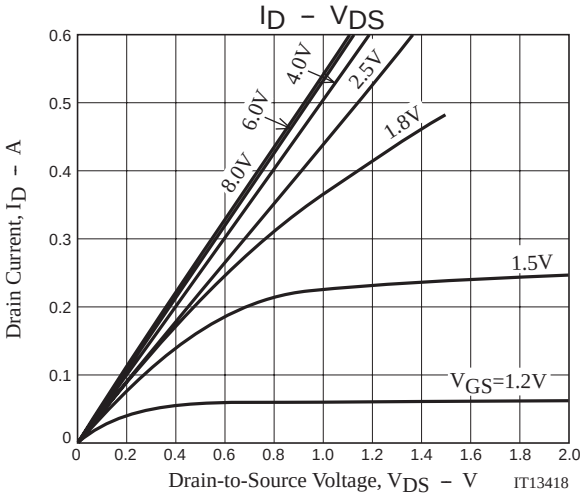
unit : mm (typ)

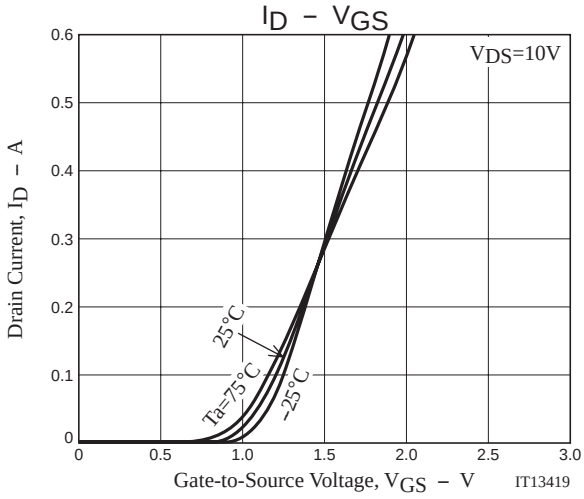
7022A-009

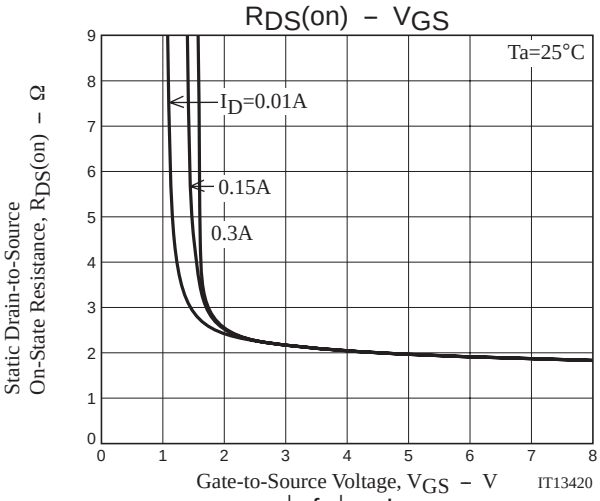


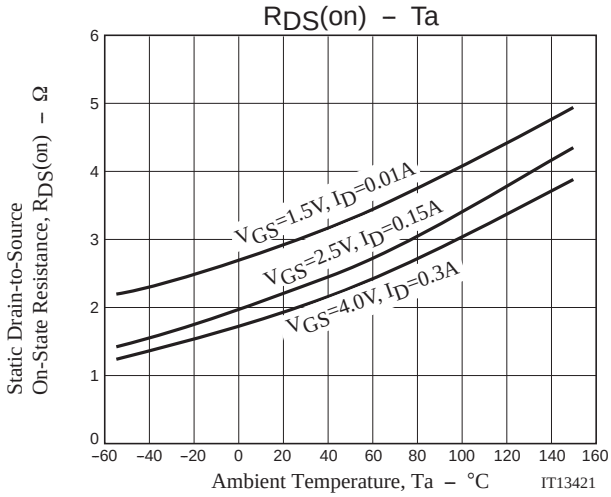
Switching Time Test Circuit

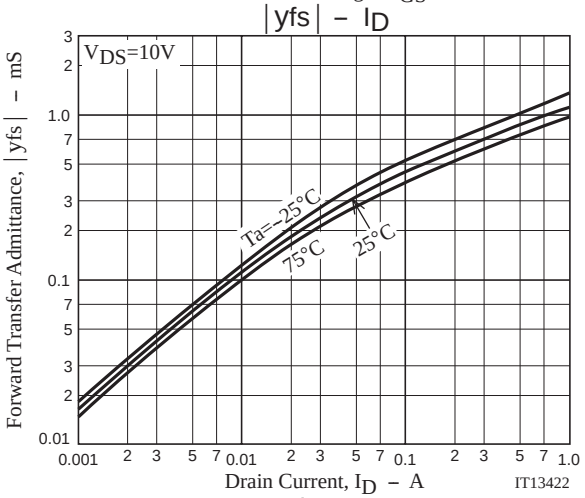


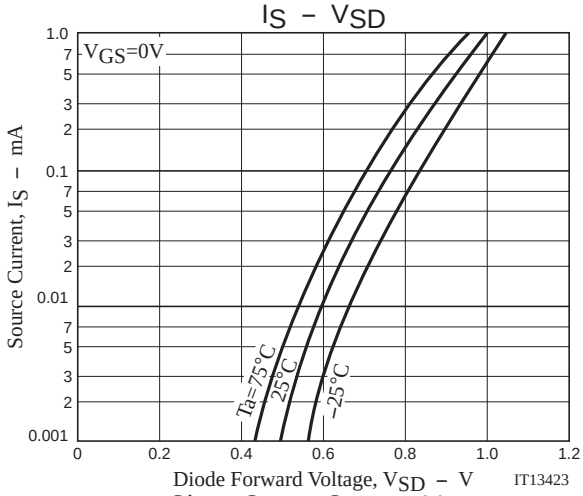


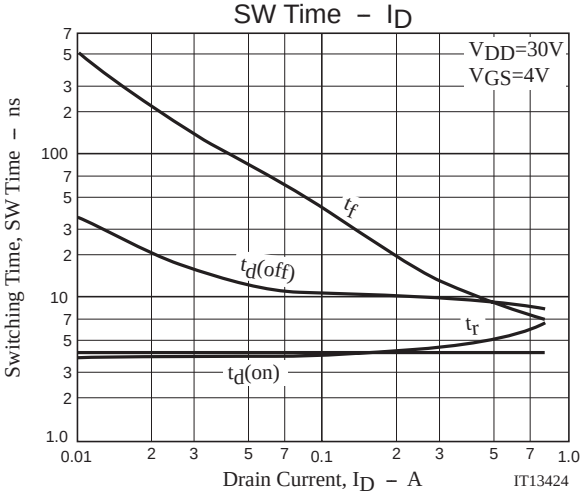


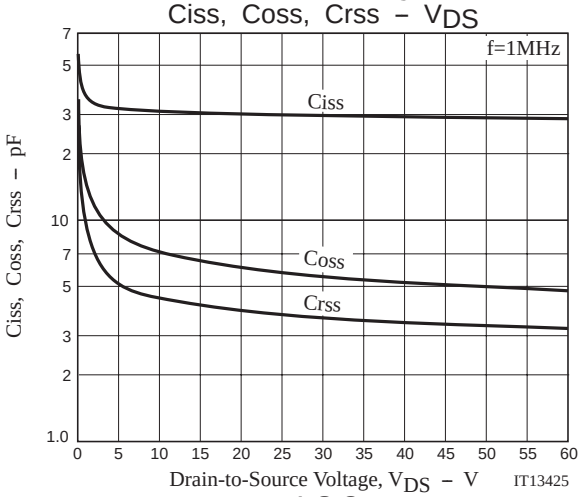

RDS(on) – VGS
Ta=25°C
ID=0.01A
0.15A
0.3A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT13420

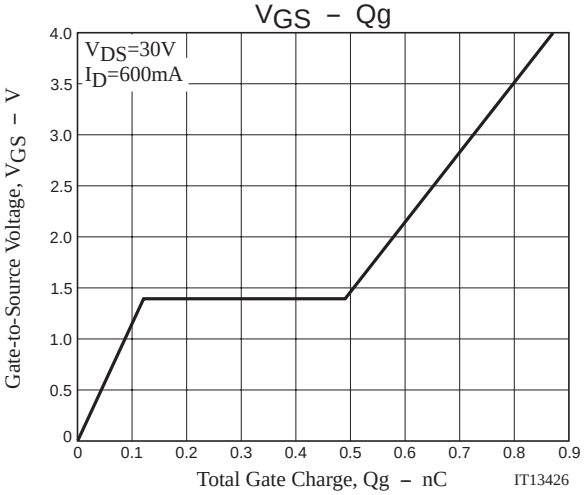

RDS(on) – Ta
VGS=1.5V, ID=0.01A
VGS=2.5V, ID=0.15A
VGS=4.0V, ID=0.3A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT13421

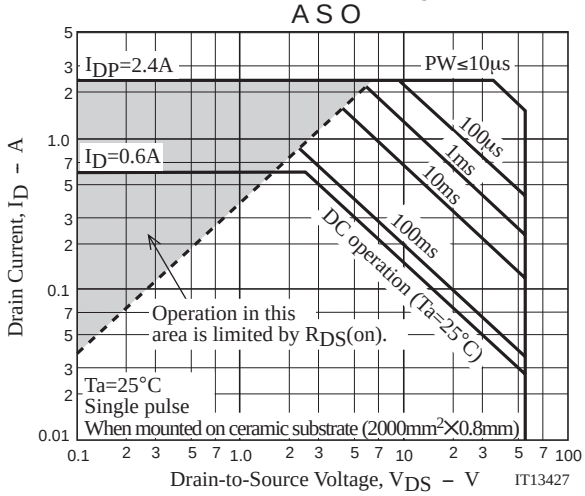

|yfs| – ID
VDS=10V
Ta=–25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – mS
Drain Current, ID – A
IT13422

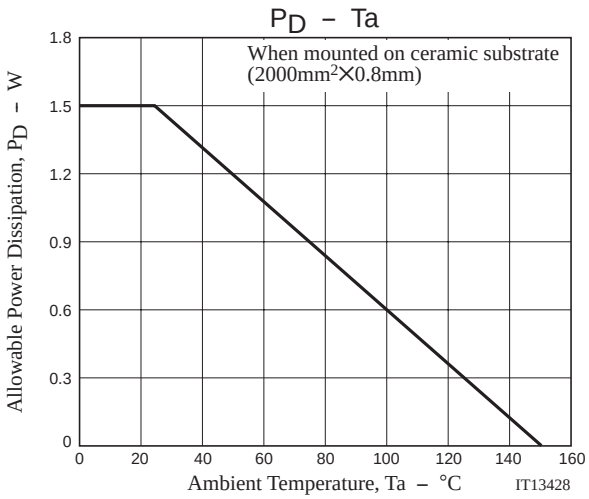

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – mA
Diode Forward Voltage, VSD – V
IT13423


SW Time – ID
VDD=30V
VGS=4V
tf
td(off)
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT13424


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13425


VGS – Qg
VDS=30V
ID=600mA
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13426


A S O
IDP=2.4A
PW≤10μs
ID=0.6A
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 (2000mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13427



Note on usage : Since the MCH6440 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.