MCH6448-TL-H Datasheet

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DiGi Electronics Part Number	MCH6448-TL-H-DG
Manufacturer	onsemi
Manufacturer Product Number	MCH6448-TL-H
Description	MOSFET N-CH 20V 8A 6MCPH
Detailed Description	N-Channel 20 V 8A (Ta) 1.5W (Ta) Surface Mount 6-MCPH

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RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MCH6448-TL-H	onsemi
Series:	Product Status:
-	Obsolete
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
20 V	8A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
1.2V, 4.5V	22mOhm @ 4A, 4.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
-	11.2 nC @ 4.5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±9V	705 pF @ 10 V
FET Feature:	Power Dissipation (Max):
-	1.5W (Ta)
Operating Temperature:	Mounting Type:
150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
6-MCPH	6-SMD, Flat Leads
Base Product Number:	
MCH6448	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

MCH6448

Power MOSFET
20V, 22mΩ, 8A, Single N-Channel

ON Semiconductor®

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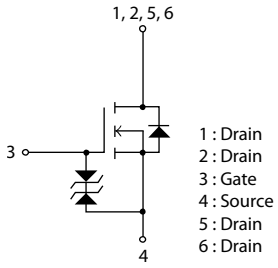
V_{DSS}	$R_{DS(on)}$ Max	I_D Max
20V	22mΩ@ 4.5V	8A
	28mΩ@ 2.5V	
	39mΩ@ 1.8V	
	124mΩ@ 1.2V	

Features

- Low On-Resistance
- 1.2V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

Electrical Connection
N-Channel



Specifications

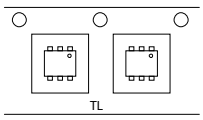
Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	20	V
Gate to Source Voltage	V_{GSS}	±9	V
Drain Current (DC)	I_D	8	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I_{DP}	32	A
Power Dissipation When mounted on ceramic substrate (1200mm^2 × 0.8mm)	P_D	1.5	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	–55 to +150	°C

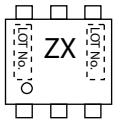
Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (1200mm^2 × 0.8mm)	$R_{\theta JA}$	83.3	°C/W

Packing Type : TL



Marking



Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

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March 2015 - Rev. 1

Publication Order Number :
MCH6448/D

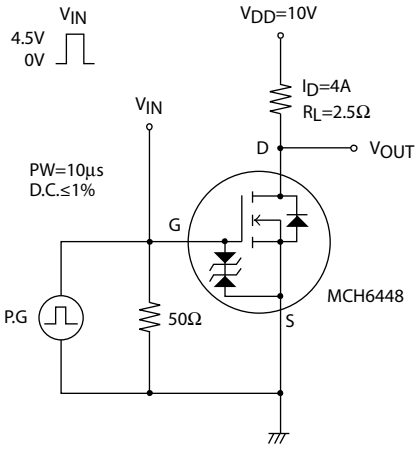
MCH6448

Electrical Characteristics at Ta = 25°C

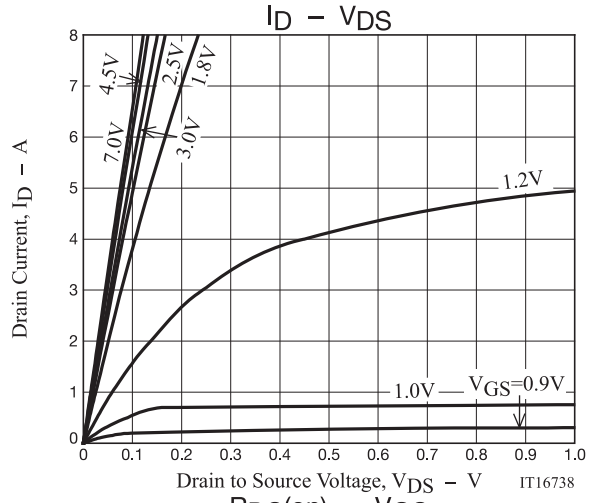
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±7.2V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	0.3		1.0	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=4A		7.7		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=4A, V_{GS}=4.5V		17	22	mΩ
	$R_{DS}(on)2$	I_D=2A, V_{GS}=2.5V		20	28	mΩ
	$R_{DS}(on)3$	I_D=1A, V_{GS}=1.8V		26	39	mΩ
	$R_{DS}(on)4$	I_D=0.5A, V_{GS}=1.2V		62	124	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		705		pF
Output Capacitance	Coss			150		pF
Reverse Transfer Capacitance	Crss			125		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		6		ns
Rise Time	t_r			47		ns
Turn-OFF Delay Time	$t_d(off)$			103		ns
Fall Time	t_f			81		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4.5V, I_D=8A		11.2		nC
Gate to Source Charge	Qgs			1.3		nC
Gate to Drain “Miller” Charge	Qgd			2.8		nC
Forward Diode Voltage	V_{SD}	I_S=8A, V_{GS}=0V		0.8	1.2	V

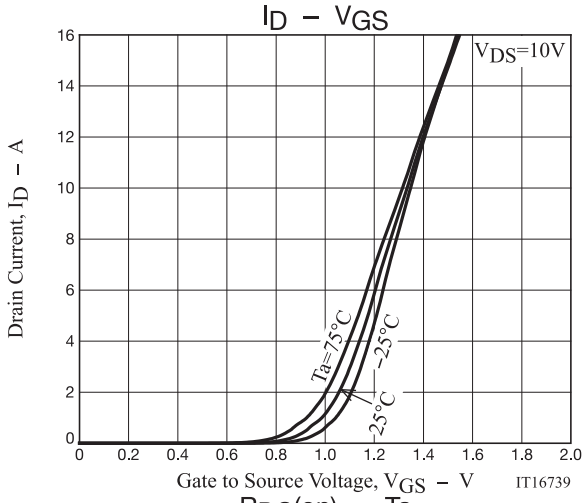
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

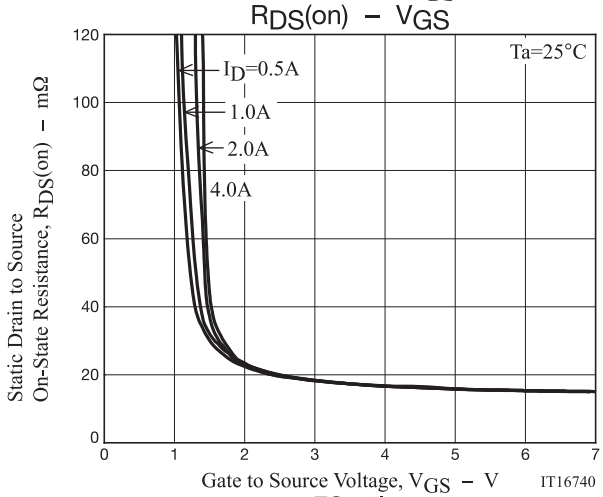
Switching Time Test Circuit

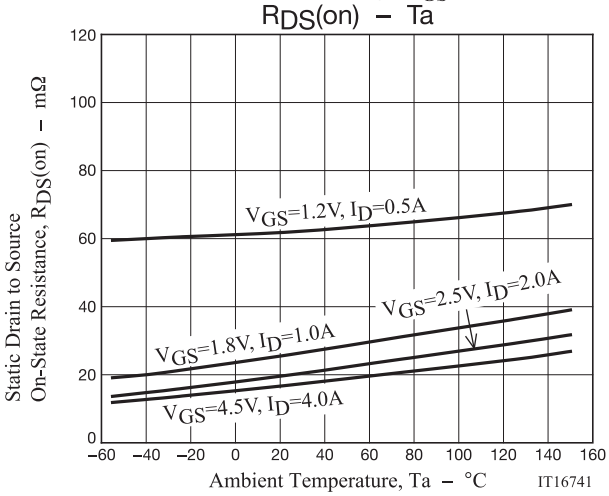


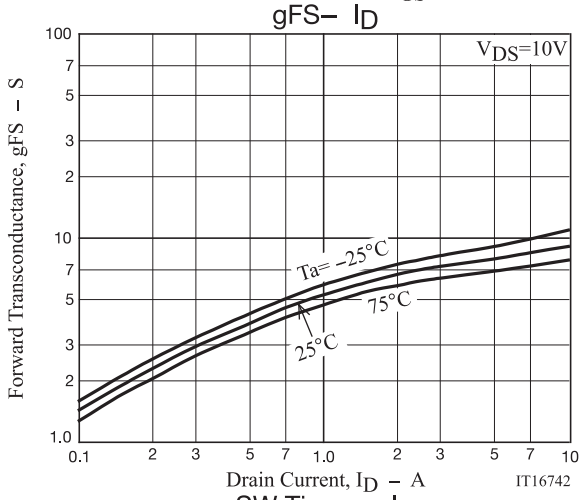
MCH6448

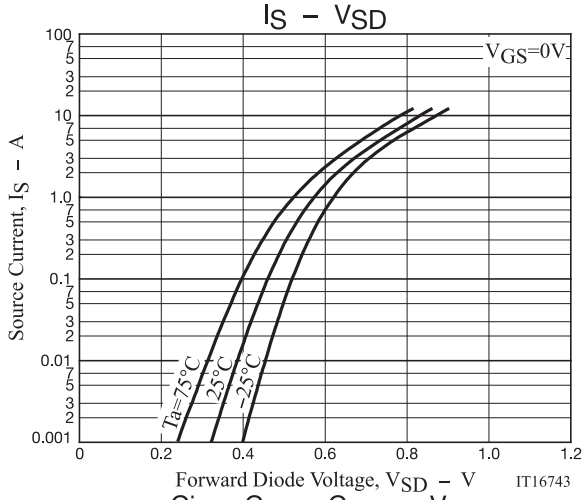

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT16738
4.5V
2.5V
1.8V
7.0V
3.0V
1.2V
1.0V
VGS=0.9V

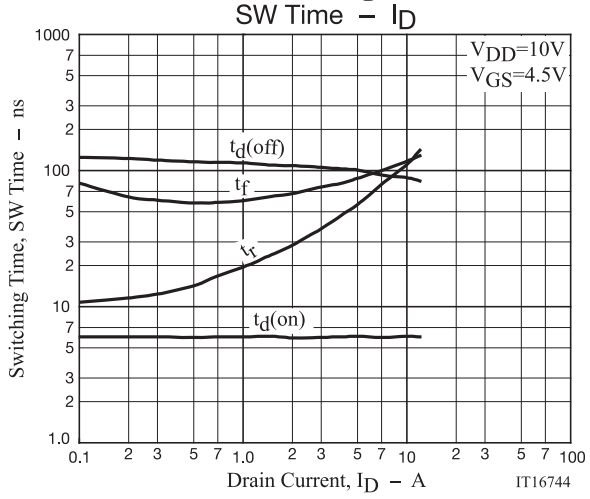

ID – VGS
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT16739
VDS=10V
Ta=75°C
25°C
–25°C

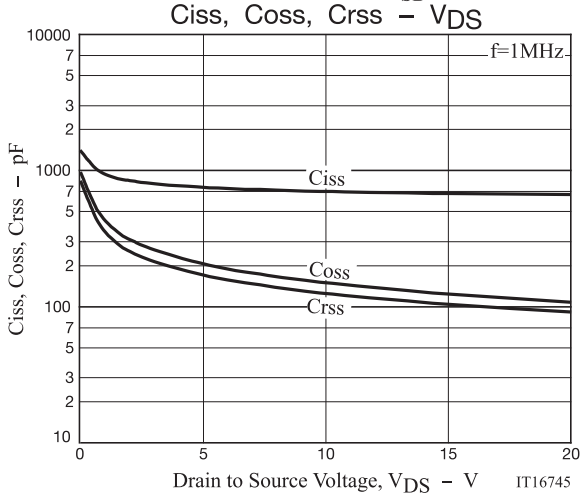

RDS(on) – VGS
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT16740
Ta=25°C
ID=0.5A
1.0A
2.0A
4.0A


RDS(on) – Ta
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT16741
VGS=1.2V, ID=0.5A
VGS=2.5V, ID=2.0A
VGS=1.8V, ID=1.0A
VGS=4.5V, ID=4.0A

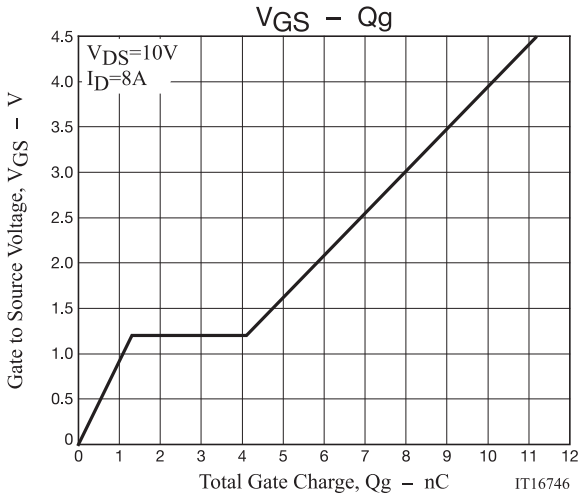

gFS– ID
Forward Transconductance, gFS – S
Drain Current, ID – A
IT16742
VDS=10V
Ta= –25°C
75°C
25°C

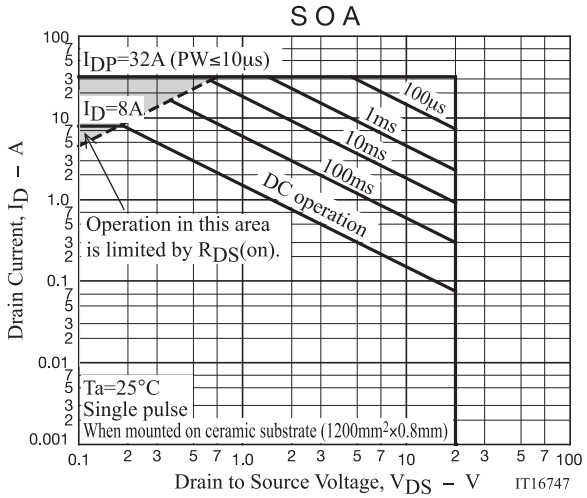

IS – VSD
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT16743
VGS=0V
Ta=75°C
25°C
–25°C

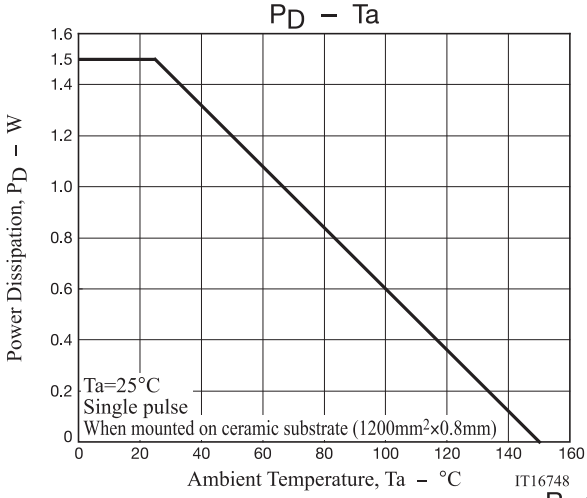

SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT16744
VDD=10V
VGS=4.5V
td(off)
tf
tr
td(on)

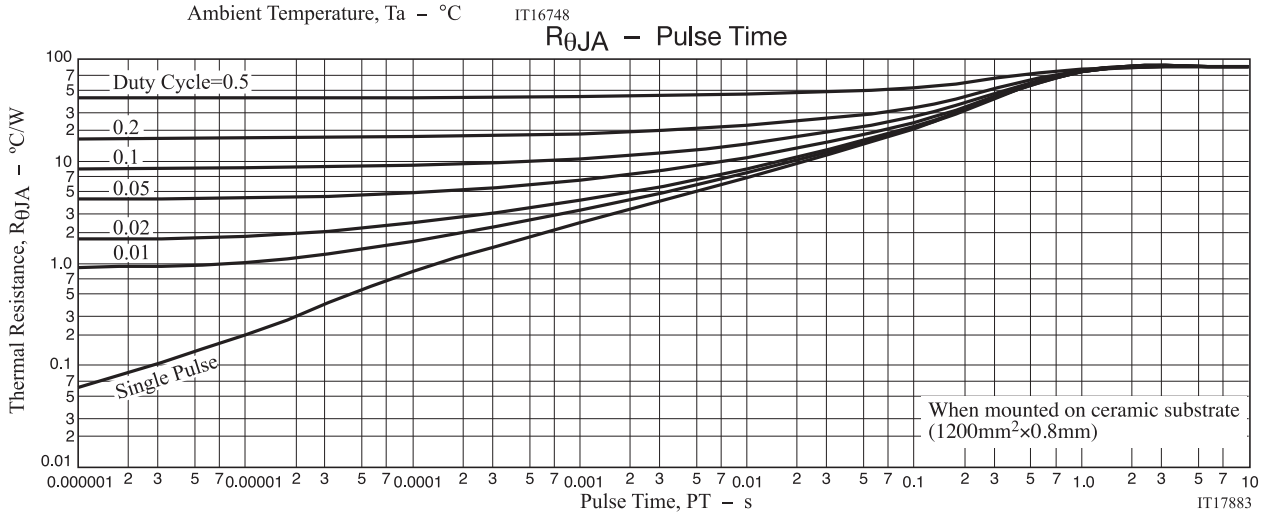

Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT16745
f=1MHz
Ciss
Coss
Crss

MCH6448


VGS – Qg
VDS=10V
ID=8A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16746


S O A
IDP=32A (PW≤10μs)
ID=8A
100μs
1ms
10ms
100ms
DC operation
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (1200mm²×0.8mm)
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT16747


PD – Ta
Ta=25°C
Single pulse
When mounted on ceramic substrate (1200mm²×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16748


RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
When mounted on ceramic substrate
(1200mm²×0.8mm)
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17883

Package Dimensions

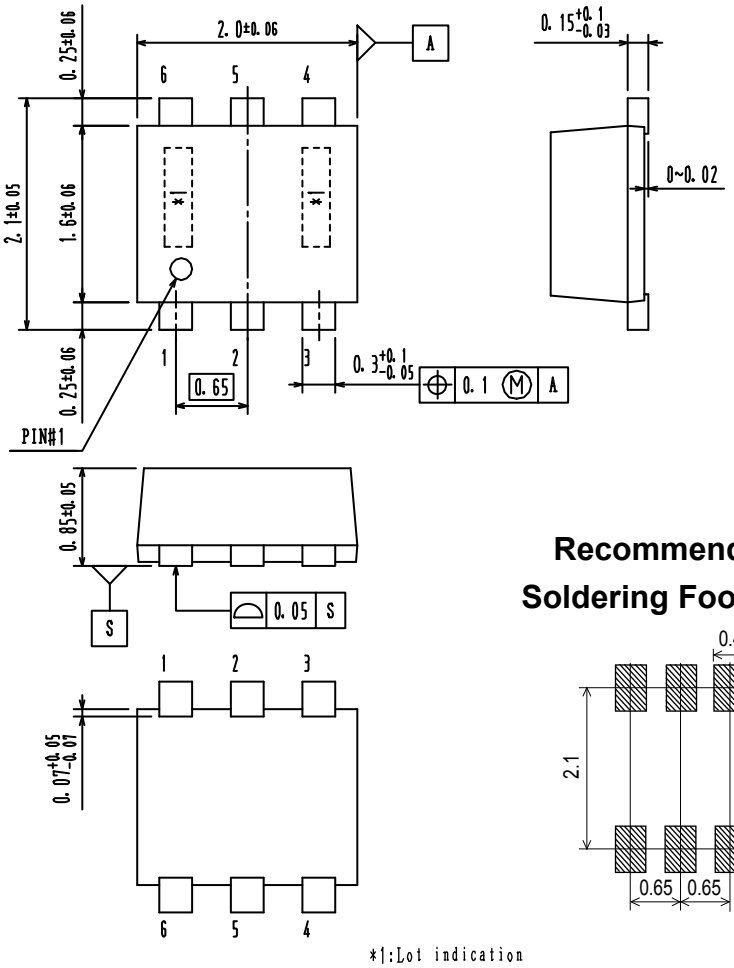
MCH6448-TL-H / MCH6448-TL-W

MCPH6

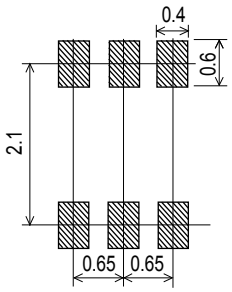
CASE 419AS
ISSUE O

unit : mm

1 : Drain
2 : Drain
3 : Gate
4 : Source
5 : Drain
6 : Drain



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Package	Shipping	Note
MCH6448-TL-H	MCPH6 SC-88FL,SC-70-6,SOT-363	3,000 pcs. / Tape & Reel	Pb-Free and Halogen Free
MCH6448-TL-W			

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Note on usage : Since the MCH6448 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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