

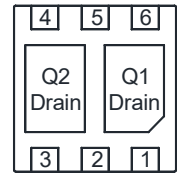
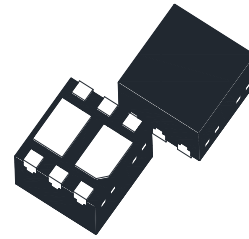
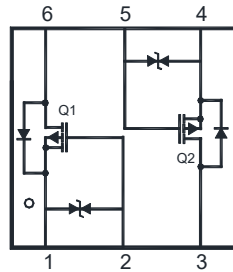
MMFTP58KMP-HAF

Dual P-Channel Enhancement Mode MOSFET

Features

- Surface-mounted package
- Advanced trench cell design
- Halogen and Antimony Free(HAF), RoHS compliant
- Typical ESD Protection HBM Class 1C

Classificatio	Voltage Range(V)
0A	< 125
0B	125 to < 250
1A	250 to < 500
1B	500 to < 1000
1C	1000 to < 2000
2	2000 to < 4000
3A	4000 to < 8000
3B	≥ 8000



Q1: 1. Source 2. Gate 6. Drain
Q2: 4. Source 5. Gate 3. Drain
DFN2020-6H Plastic Package

Applications

- Portable appliances
- Battery management
- High speed switch
- Low power DC to DC Converter

Absolute Maximum Ratings (T_a = 25°C)

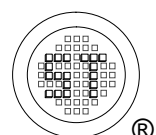
Parameter	Symbol	Value	Unit
Drain-Source Voltage	-V _{DS}	20	V
Gate-Source Voltage	V _{GS}	± 8	V
Drain Current	-I _D	3.6	A
Pulsed Drain Current ¹⁾	-I _{DM}	14.4	A
Power Dissipation ²⁾	P _D	512	mW
Operating Junction Temperature Range	T _J	- 55 to + 150	°C
Storage Temperature Range	T _{stg}	- 65 to + 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ²⁾	R _{θJA}	244	°C/W

¹⁾ Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%, Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.

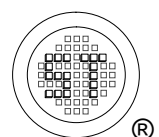
²⁾ Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.



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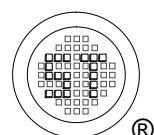
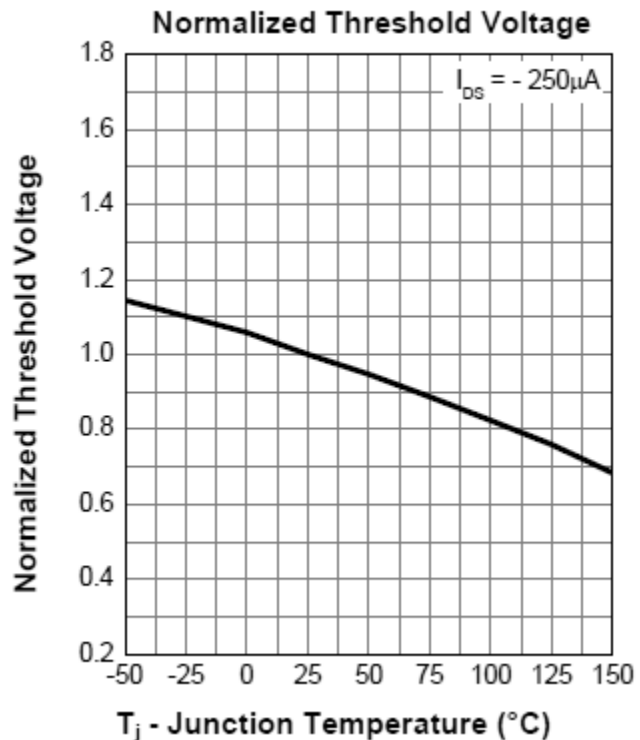
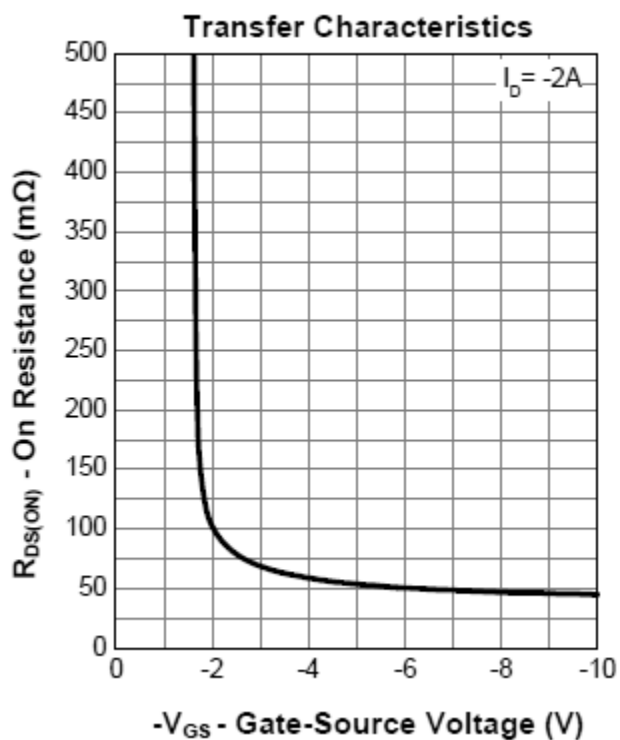
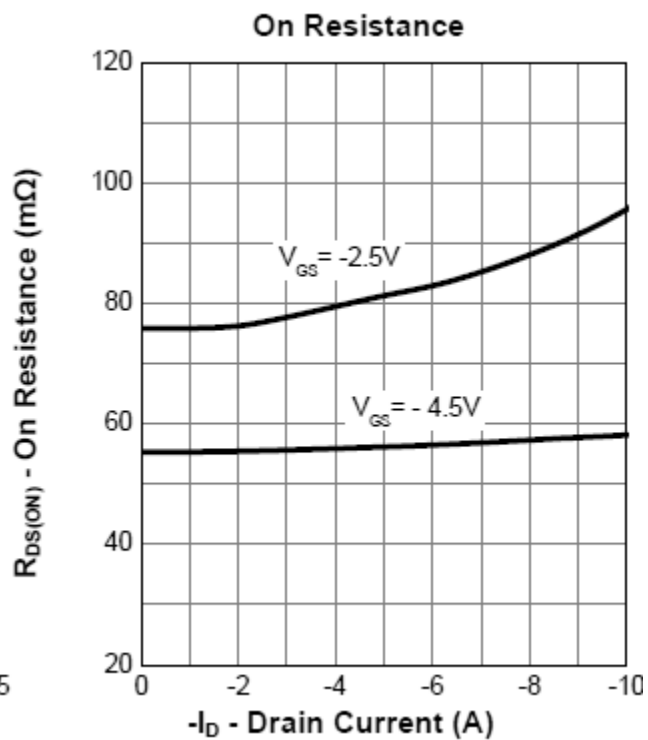
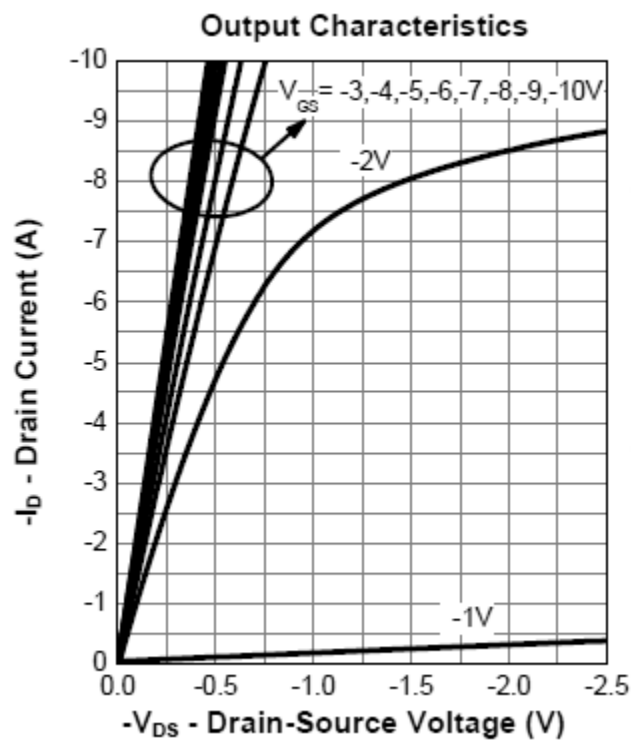
Characteristics at $T_j = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $-I_D = 250\ \mu\text{A}$	$-BV_{DSS}$	20	-	-	V
Drain-Source Leakage Current at $-V_{DS} = 20\ \text{V}$	$-I_{DSS}$	-	-	1	μA
Gate Leakage Current at $V_{GS} = \pm 8\ \text{V}$	I_{GSS}	-	-	± 10	μA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $-I_D = 250\ \mu\text{A}$	$-V_{GS(th)}$	0.45	-	0.95	V
Drain-Source On-State Resistance at $-V_{GS} = 4.5\ \text{V}$, $-I_D = 2\ \text{A}$ at $-V_{GS} = 2.5\ \text{V}$, $-I_D = 1.5\ \text{A}$ at $-V_{GS} = 1.8\ \text{V}$, $-I_D = 1\ \text{A}$	$R_{DS(on)}$	- - -	- - -	67 95 137	$\text{m}\Omega$
DYNAMIC PARAMETERS					
Forward Transconductance at $-V_{DS} = 10\ \text{V}$, $-I_D = 2\ \text{A}$	g_{fs}	-	5	-	S
Input Capacitance at $-V_{DS} = 10\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}	-	518	-	pF
Output Capacitance at $-V_{DS} = 10\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}	-	72	-	pF
Reverse Transfer Capacitance at $-V_{DS} = 10\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}	-	67	-	pF
Total Gate Charge at $-V_{DS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $-V_{GS} = 10\ \text{V}$	Q_g	-	13	-	nC
Gate Source Charge at $-V_{DS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $-V_{GS} = 10\ \text{V}$	Q_{gs}	-	1.7	-	nC
Gate Drain Charge at $-V_{DS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $-V_{GS} = 10\ \text{V}$	Q_{gd}	-	1.2	-	nC
Turn-On Delay Time at $-V_{DD} = 10\ \text{V}$, $-V_{GS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $R_G = 4.7\ \Omega$	$t_{d(on)}$	-	5.8	-	ns
Turn-On Rise Time at $-V_{DD} = 10\ \text{V}$, $-V_{GS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $R_G = 4.7\ \Omega$	t_r	-	31	-	ns
Turn-Off Delay Time at $-V_{DD} = 10\ \text{V}$, $-V_{GS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $R_G = 4.7\ \Omega$	$t_{d(off)}$	-	40	-	ns
Turn-Off Fall Time at $-V_{DD} = 10\ \text{V}$, $-V_{GS} = 10\ \text{V}$, $-I_D = 3\ \text{A}$, $R_G = 4.7\ \Omega$	t_f	-	10	-	ns
Body-Diode PARAMETERS					
Body Diode Voltage at $-I_S = 1\ \text{A}$	$-V_{SD}$	-	-	1.2	V
Body Diode Reverse Recovery Time at $-I_S = 3\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	t_{rr}	-	38	-	ns
Body Diode Reverse Recovery Charge at $-I_S = 3\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	Q_{rr}	-	8.8	-	nC



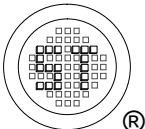
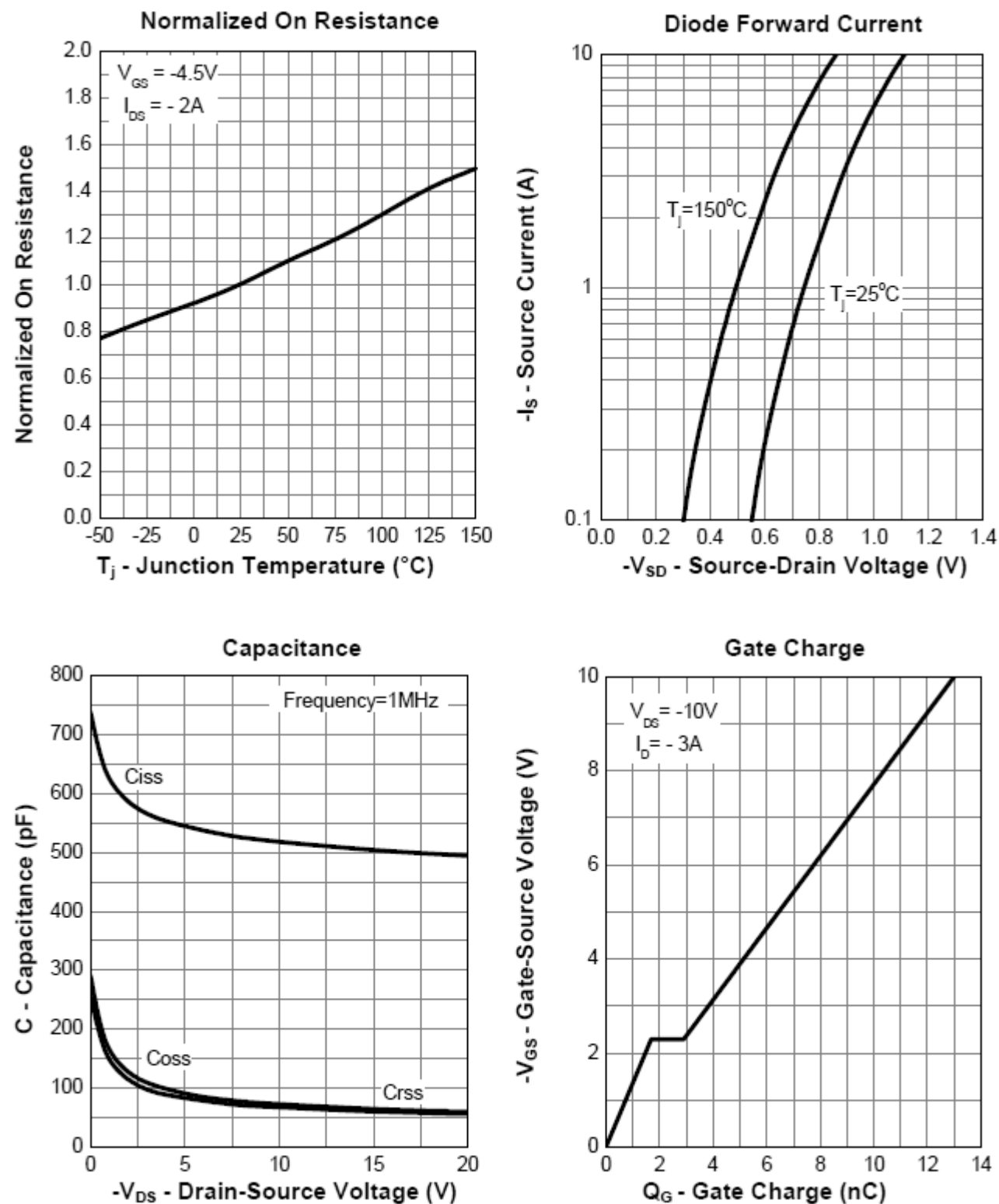
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Electrical Characteristics Curves



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Electrical Characteristics Curves



Test Circuits

Fig.1-1 Switching times test circuit

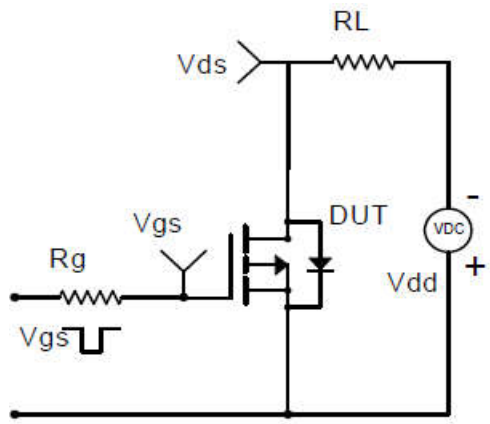


Fig.1-2 Switching Waveform

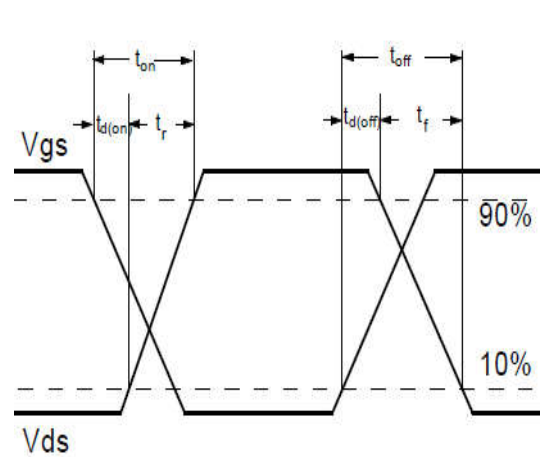


Fig.2-1 Gate charge test circuit

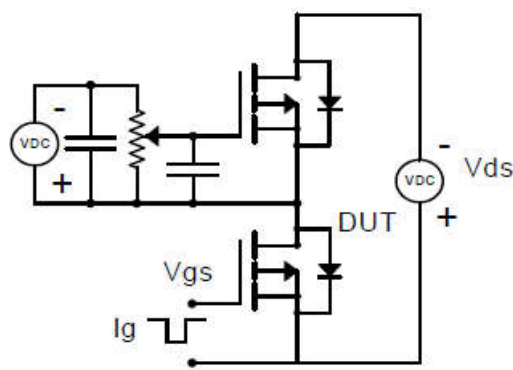
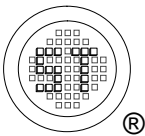
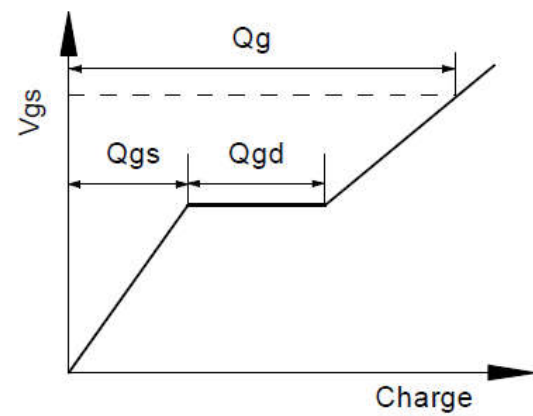


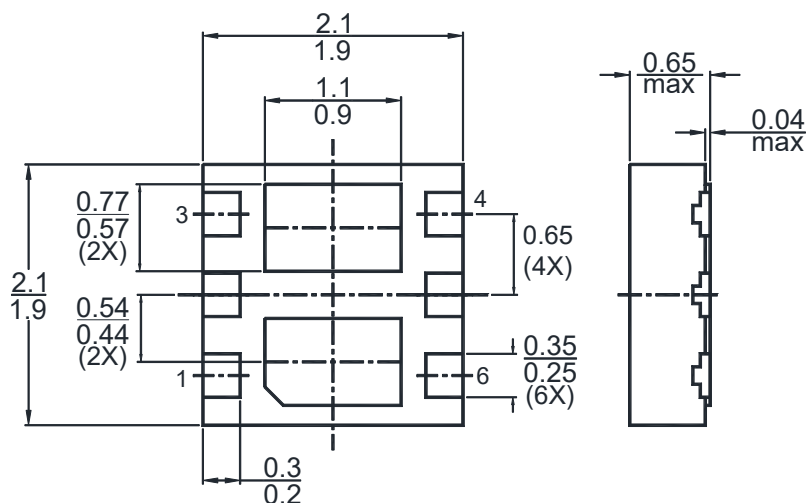
Fig.2-2 Gate charge waveform



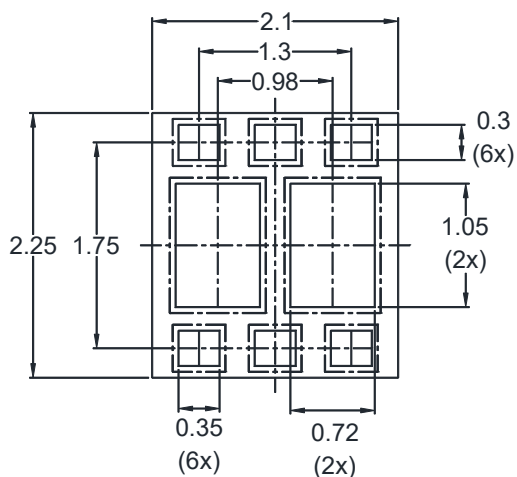
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Package Outline

(Dimensions in mm)



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
DFN2020-6H	8	4 ± 0.1	0.157 ± 0.004	178	7	4,000

Marking information

"MH" = Part No.

"•" = HAF (Halogen and Antimony Free)

"YYWW" = Date Code Marking

"Y" = Year (ex: 19 = 2019)

"W" = Week (ex: 09 = the 9th week of the year)

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