

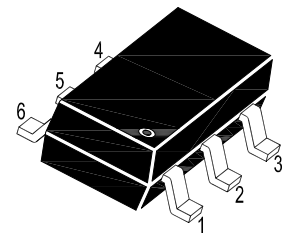
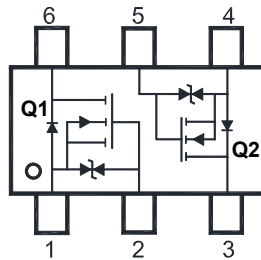
MMFTN620DW-HAF

Dual N-Channel Enhancement Mode MOSFET

Features

- Low gate threshold voltage
- Halogen and Antimony Free(HAF), RoHS compliant
- Typical ESD Protection HBM Class 2

Classification	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



1.Source1 2. Gate1 3. Drain2
4. Source2 5.Gate2 6. Drain1
SOT-363 Plastic Package

Applications

- Portable appliances
- Battery management

Absolute Maximum Ratings (at $T_a = 25^\circ\text{C}$ unless otherwise specified)(Q1/Q2)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	350	mA
Peak Drain Current, Pulsed ¹⁾	I_{DM}	1.4	A
Power Dissipation	P_D	320 ²⁾ 410 ³⁾	mW
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

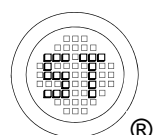
Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	390 ²⁾ 305 ³⁾	$^\circ\text{C/W}$

¹⁾ Pulse Test: Pulse Width $\leq 100 \mu\text{s}$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.

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

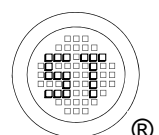
³⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.



MMFTN620DW-HAF

Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified(Q1/Q2)

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250\ \mu\text{A}$	$V_{(BR)DSS}$	60	-	-	V
Drain-Source Leakage Current at $V_{DS} = 60\ \text{V}$	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current at $V_{GS} = \pm 20\ \text{V}$	I_{GSS}	-	-	10	μA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	$V_{GS(th)}$	0.5	-	1	V
Drain-Source On-State Resistance at $V_{GS} = 4.5\ \text{V}$, $I_D = 100\ \text{mA}$ at $V_{GS} = 2.5\ \text{V}$, $I_D = 50\ \text{mA}$ at $V_{GS} = 1.8\ \text{V}$, $I_D = 50\ \text{mA}$	$R_{DS(on)}$	- - -	- - -	2 2.5 3	Ω
DYNAMIC PARAMETERS					
Gate resistance at $V_{DS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	R_g	-	38	-	Ω
Forward Transconductance at $V_{DS} = 5\ \text{V}$, $I_D = 0.4\ \text{A}$	g_{FS}	-	0.7	-	S
Input Capacitance at $V_{DS} = 25\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}	-	49	-	pF
Output Capacitance at $V_{DS} = 25\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}	-	10	-	pF
Reverse Transfer Capacitance at $V_{DS} = 25\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}	-	8	-	pF
Total Gate Charge at $V_{DS} = 25\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 10\ \text{V}$	Q_g	-	1.9	-	nC
Gate Source Charge at $V_{DS} = 25\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 10\ \text{V}$	Q_{gs}	-	0.5	-	nC
Gate Drain Charge at $V_{DS} = 25\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 10\ \text{V}$	Q_{gd}	-	0.2	-	nC
Turn-On Delay Time at $V_{DD} = 6\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 4.5\ \text{V}$, $R_G = 51\ \Omega$	$t_{d(on)}$	-	13	-	ns
Turn-On Rise Time at $V_{DD} = 6\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 4.5\ \text{V}$, $R_G = 51\ \Omega$	t_r	-	13	-	ns
Turn-Off Delay Time at $V_{DD} = 6\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 4.5\ \text{V}$, $R_G = 51\ \Omega$	$t_{d(off)}$	-	7.7	-	ns
Turn-Off Fall Time at $V_{DD} = 6\ \text{V}$, $I_D = 1\ \text{A}$, $V_{GS} = 4.5\ \text{V}$, $R_G = 51\ \Omega$	t_f	-	4.6	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 115\ \text{mA}$	V_{SD}	-	-	1.3	V
Body-Diode Continuous Current	I_S	-	-	350	mA
Body Diode Reverse Recovery Time at $I_S = 1\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	t_{rr}	-	9	-	ns
Body Diode Reverse Recovery Charge at $I_S = 1\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	Q_{rr}	-	3.7	-	nc



Electrical Characteristics Curves(Q1/Q2)

Fig.1 Output Characteristic

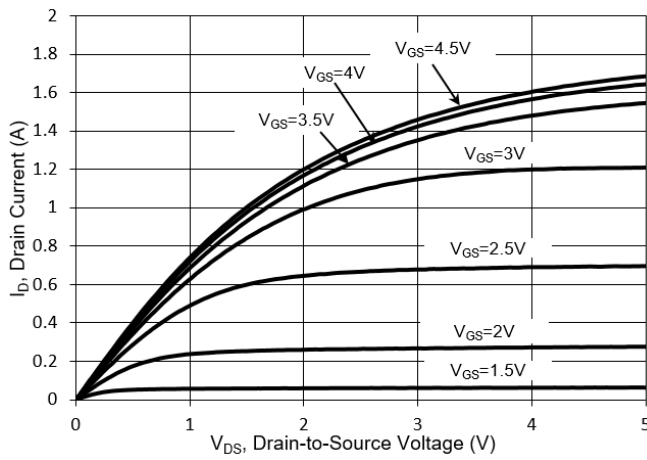


Fig.2 Transfer Characteristic

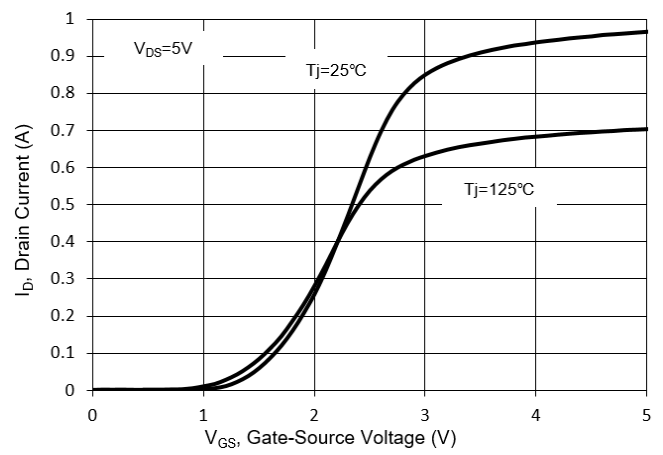


Fig.3 On Resistance vs. Gate-Source

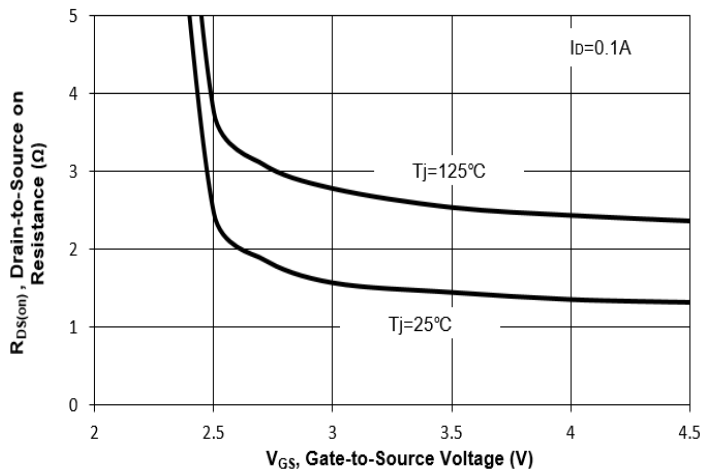


Fig.4 On Resistance vs. Temperatuer

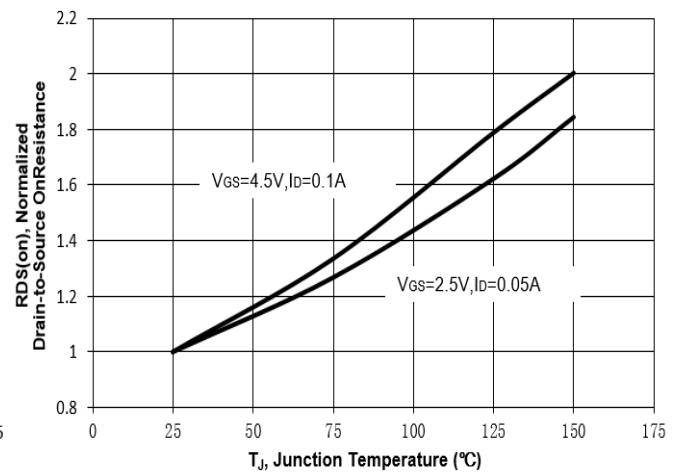


Fig.5 On Resistance vs. Drain Current

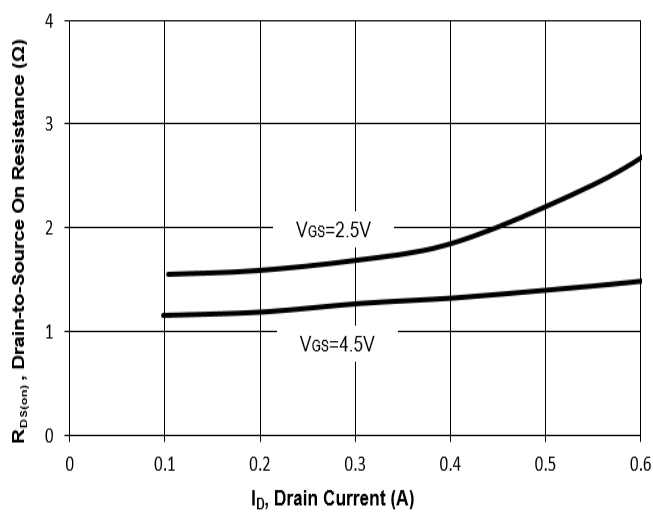
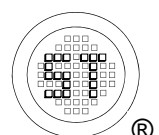
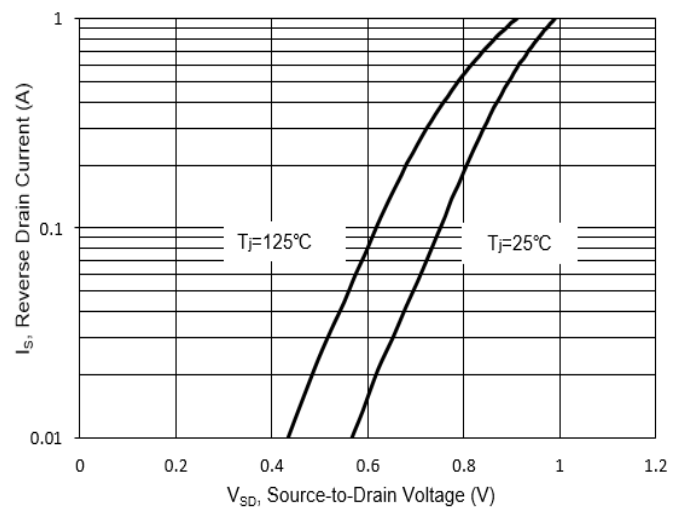


Fig.6 Source-Drain Diode Forward



Electrical Characteristics Curves(Q1/Q2)

Fig.7 Capacitance Characteristic

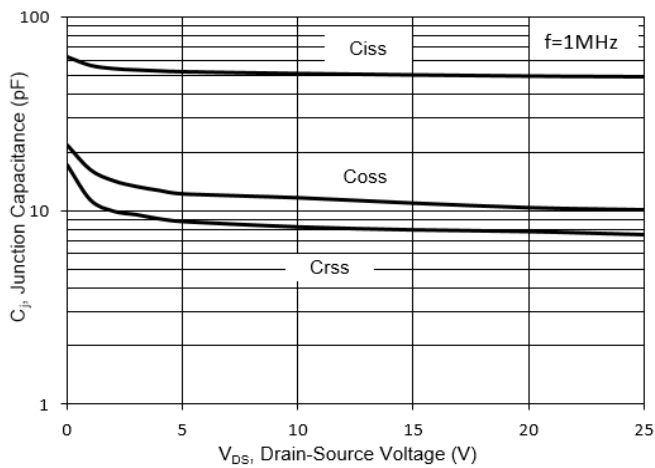


Fig.8 Drain-Source Breakdown Voltage vs. T_j

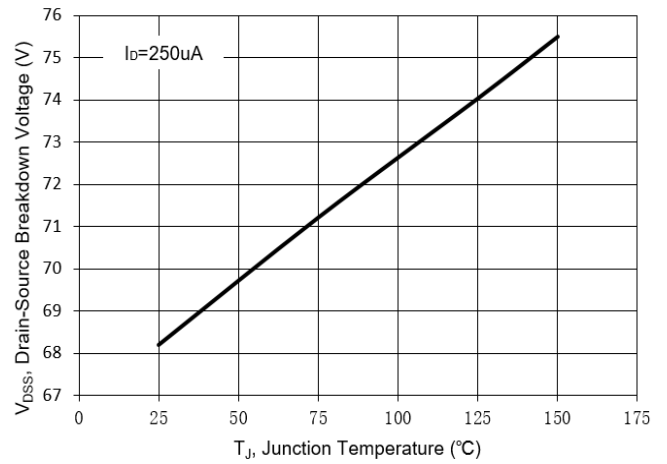


Fig.9 Gate-Source Threshold Voltage vs. T_j

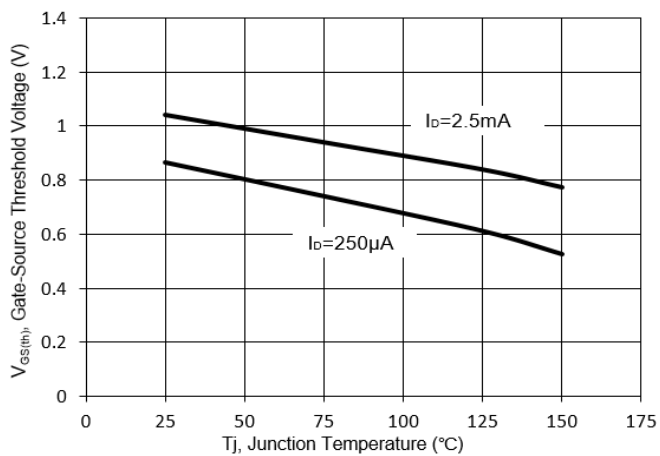
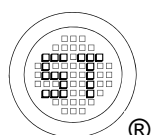
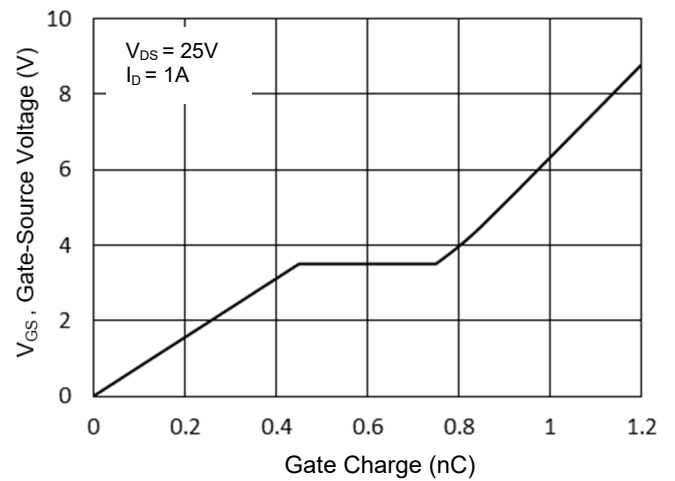


Fig.10 Gate Charge



Test Circuits

Fig.1-1 Switching times test circuit

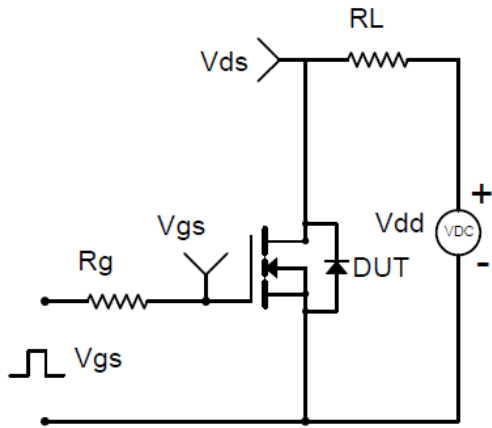


Fig.1-2 Switching Waveform

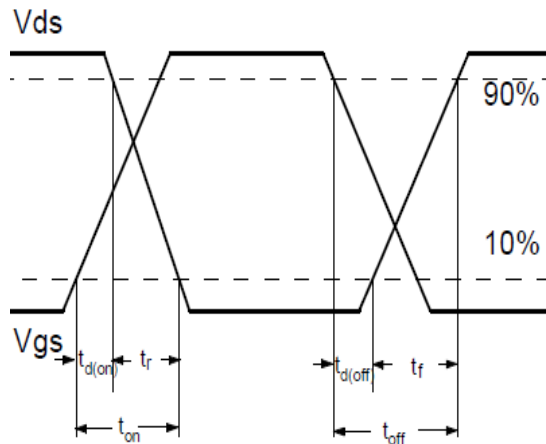


Fig.2-1 Gate charge test circuit

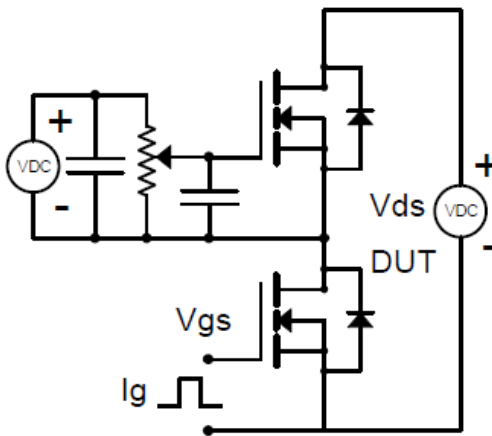
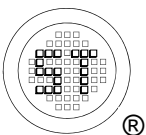
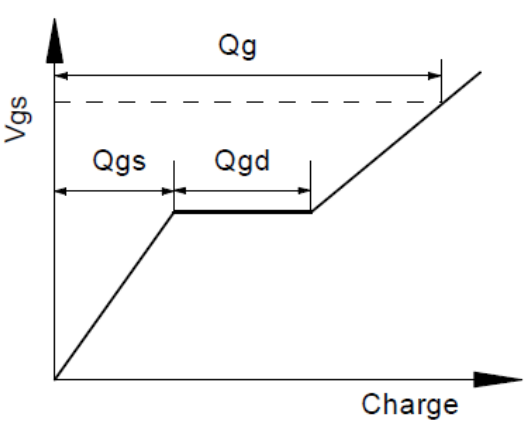


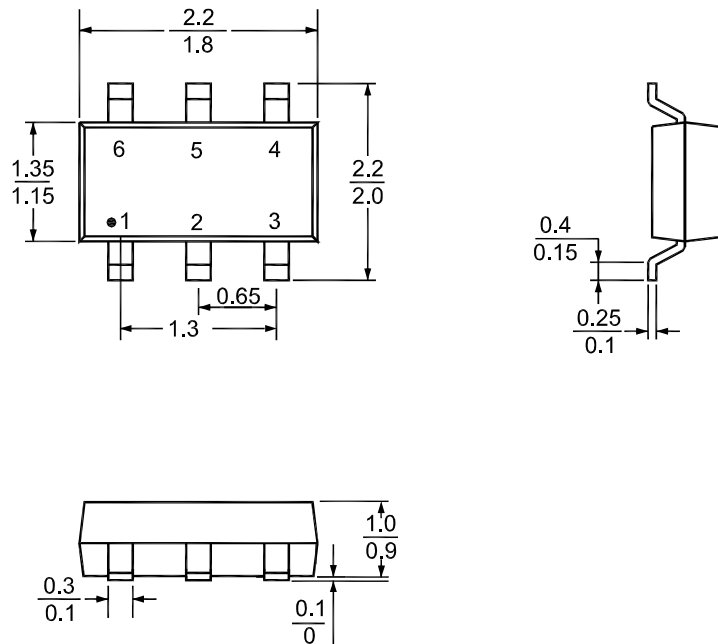
Fig.2-2 Gate charge waveform



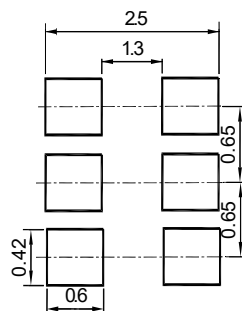
MMFTN620DW-HAF

Package Outline Dimensions (Units: mm)

SOT-363



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-363	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" • " = HAF (Halogen and Antimony Free)

" MH " = Part No.

YM = Date Code Marking

Y = Year

M = Month

Font type: Arial

