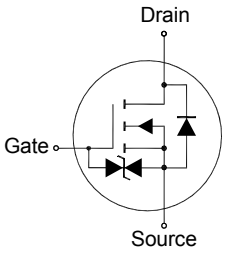
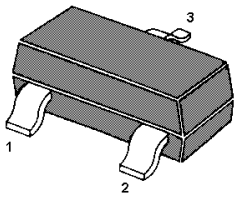
MMFTN1012

N-Channel Enhancement Mode MOSFET

Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- ESD protected up to 2 KV





1. Gate 2. Source 3. Drain
TO-236 Plastic Package

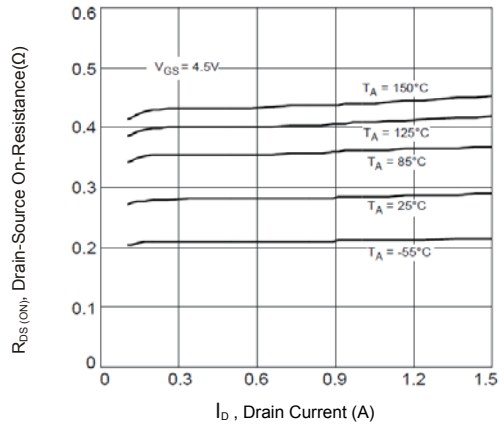
Absolute Maximum Ratings

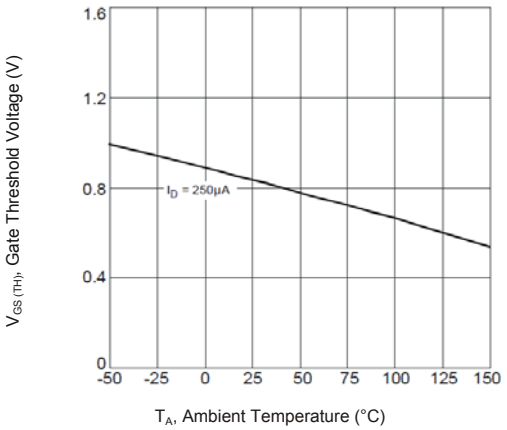
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 6	V
Drain Current [1)] T_A = 25℃ T_A = 85℃	I_D	0.63 0.45	A
Peak Drain Current	I_{DM}	6	A
Power Dissipation [1)]	P_D	0.28	W
Maximum Thermal Resistance from Juntion to Ambient	$R_{\theta JA}$	452	℃/W
Operating and Storage Temperature Range	T_j, T_{stg}	- 55 to + 150	℃

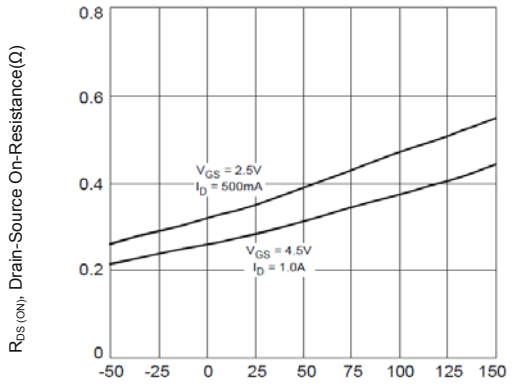
[1)] Device mounted on an FR-4 PCB

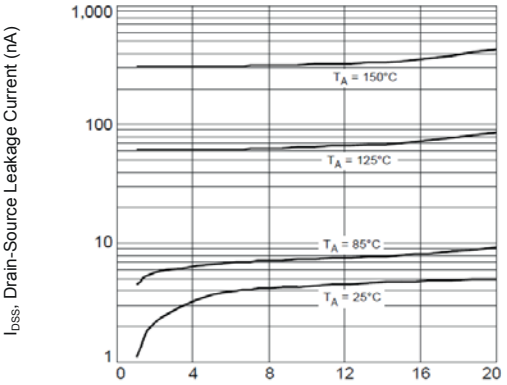
Characteristics at T_j = 25℃ unless otherwise specified

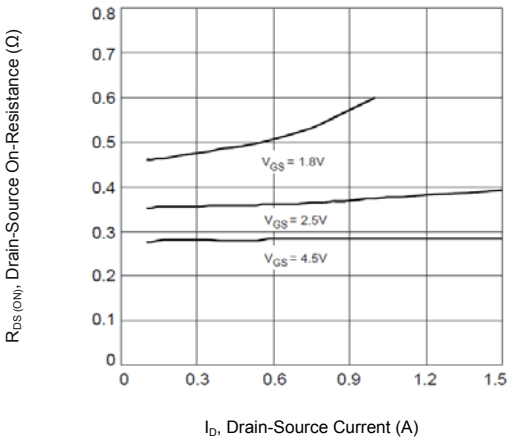
Parameter	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage at I_D = 250 µA	BV_{DSS}	20	-	-	V
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_D = 250 uA	V_{GSth}	0.5	-	1	V
Drain-Source Leakage Current at V_{DS} = 20 V	I_{DSS}	-	-	100	nA
Gate Leakage Current at V_{GS} = ± 4.5 V	I_{GSS}	-	-	±1	µA
Drain-Source On-State Resistance at V_{GS} = 4.5 V, I_D = 600 mA at V_{GS} = 2.5 V, I_D = 500 mA at V_{GS} = 1.8 V, I_D = 350 mA	$R_{DS(on)}$	- - -	- - -	0.4 0.5 0.7	Ω
Forward transfer admittance at V_{DS} = 10 V, I_D = 400 mA	$\|y_{fs}\|$	-	1.4	-	S
Diode Forward Voltage at I_S = 150 mA, V_{GS}= 0 V	V_{SD}	-	-	1.2	V
Input Capacitance at V_{GS} = 0 V,V_{DS} = 16 V, f = 1 MHz	C_{iss}	-	60.67	-	pF
Output Capacitance at V_{GS} = 0 V,V_{DS} = 16 V, f = 1 MHz	C_{oss}	-	9.68	-	pF
Reverse Transfer Capacitance at V_{GS} = 0 V, V_{DS} = 16 V, f = 1 MHz	C_{rss}	-	5.37	-	pF
Turn-On Delay Time at V_{GS} = 4.5 V, V_{DD} = 10 V, R_L= 47 Ω, R_G= 10 Ω, I_D = 200 mA	$t_{d(on)}$	-	5.1	-	ns
Turn-On Rise Time at V_{GS} = 4.5 V, V_{DD} = 10 V, R_L= 47 Ω, R_G= 10 Ω, I_D = 200 mA	t_r	-	7.4	-	ns
Turn-Off Delay Time at V_{GS} = 4.5 V, V_{DD} = 10 V, R_L= 47 Ω, R_G= 10 Ω, I_D = 200 mA	$t_{d(off)}$	-	26.7	-	ns
Turn-Off Fall Time at V_{GS} = 4.5 V, V_{DD} = 10 V, R_L= 47 Ω, R_G= 10 Ω, I_D = 200 mA	t_f	-	12.3	-	ns

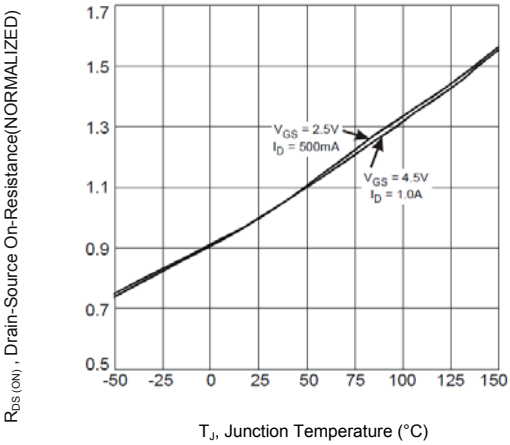

$R_{DS(ON)}$, Drain-Source On-Resistance(Ω)
V_{GS} = 4.5V
T_A = 150°C
T_A = 125°C
T_A = 85°C
T_A = 25°C
T_A = -55°C
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.3
0.6
0.9
1.2
1.5
I_D , Drain Current (A)


$V_{GS(TH)}$, Gate Threshold Voltage (V)
I_D = 250μA
1.6
1.2
0.8
0.4
0
-50
-25
0
25
50
75
100
125
150
T_A, Ambient Temperature (°C)


$R_{DS(ON)}$, Drain-Source On-Resistance(Ω)
V_{GS} = 2.5V
I_D = 500mA
V_{GS} = 4.5V
I_D = 1.0A
0.8
0.6
0.4
0.2
0
-50
-25
0
25
50
75
100
125
150
T_J, Junction Temperature(°C)


I_{DSS}, Drain-Source Leakage Current (nA)
T_A = 150°C
T_A = 125°C
T_A = 85°C
T_A = 25°C
1,000
100
10
1
0
4
8
12
16
20
V_{DS}, Drain-Source Voltage (V)


$R_{DS(ON)}$, Drain-Source On-Resistance (Ω)
V_{GS} = 1.8V
V_{GS} = 2.5V
V_{GS} = 4.5V
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.3
0.6
0.9
1.2
1.5
I_D, Drain-Source Current (A)


$R_{DS(ON)}$, Drain-Source On-Resistance(NORMALIZED)
V_{GS} = 2.5V
I_D = 500mA
V_{GS} = 4.5V
I_D = 1.0A
1.7
1.5
1.3
1.1
0.9
0.7
0.5
-50
-25
0
25
50
75
100
125
150
T_J, Junction Temperature (°C)