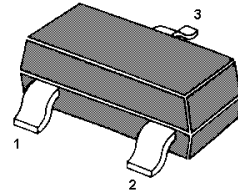


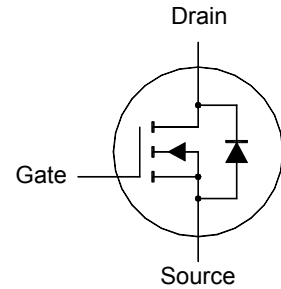
MMFTN138W

N-Channel Logic Level Enhancement Mode Field Effect Transistor

for low voltage, low current switching applications



1. Gate 2. Source 3. Drain
SOT-323 Plastic Package

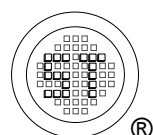


Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	50	V
Drain-Gate Voltage ($R_{GS} \leq 20 \text{ K}\Omega$)	V_{DGR}	50	V
Gate-Source Voltage - Continuous Gate-Source Voltage - Non-Repetitive ($T_P < 50 \mu\text{s}$)	V_{GSS}	± 20 ± 40	V
Drain Current - Continuous Drain Current - Pulsed	I_D	220 880	mA
Total Power Dissipation	P_{tot}	200	mW
Operating and Storage Temperature Range	T_j, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	625	$^\circ\text{C/W}$



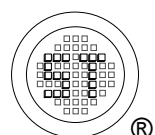
MMFTN138W

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

Parameter	Symbol	Min.	Max.	Unit
Drain-Source Breakdown Voltage at $I_D = 250\ \mu\text{A}$	$V_{(BR)DSS}$	50	-	V
Drain-Source Leakage Current at $V_{DS} = 50\ \text{V}$ at $V_{DS} = 30\ \text{V}$	I_{DSS}	- -	500 100	nA
Gate-Source Leakage Current at $V_{GS} = \pm 20\ \text{V}$	I_{GSS}	-	± 100	nA
Gate-Source Threshold Voltage at $V_{GS} = V_{DS}$, $I_D = 1\ \text{mA}$	$V_{GS(th)}$	0.8	1.6	V
Drain-Source On-State Resistance at $V_{GS} = 10\ \text{V}$, $I_D = 220\ \text{mA}$ at $V_{GS} = 4.5\ \text{V}$, $I_D = 220\ \text{mA}$	$R_{DS(on)}$	- -	3.5 6	Ω
Forward Transconductance at $V_{DS} = 10\ \text{V}$, $I_D = 220\ \text{mA}$	g_{FS}	0.12	-	S
Input Capacitance at $V_{DS} = 25\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}	-	60	pF
Output Capacitance at $V_{DS} = 25\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}	-	25	pF
Reverse Transfer Capacitance at $V_{DS} = 25\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}	-	10	pF
Turn-On Delay Time at $V_{DD} = 30\ \text{V}$, $I_D = 290\ \text{mA}$, $V_{GS} = 10\ \text{V}$, $R_G = 50\ \Omega$	$t_{d(on)}$	-	8	ns
Turn-On Rise Time at $V_{DD} = 30\ \text{V}$, $I_D = 290\ \text{mA}$, $V_{GS} = 10\ \text{V}$, $R_G = 50\ \Omega$	t_r	-	12	ns
Turn-Off Delay Time at $V_{DD} = 30\ \text{V}$, $I_D = 290\ \text{mA}$, $V_{GS} = 10\ \text{V}$, $R_G = 50\ \Omega$	$t_{d(off)}$	-	16	ns
Turn-Off Fall Time at $V_{DD} = 30\ \text{V}$, $I_D = 290\ \text{mA}$, $V_{GS} = 10\ \text{V}$, $R_G = 50\ \Omega$	t_f	-	22	ns

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Continuous Source Current	I_S	-	220	mA
Maximum Pulse Source Current	I_{SM}	-	880	mA
Drain-Source Diode Forward Voltage at $I_S = 440\ \text{mA}$	V_{SD}	-	1.4	V



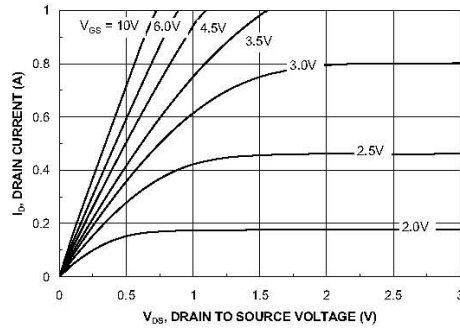


Figure 1. On-Region Characteristics.

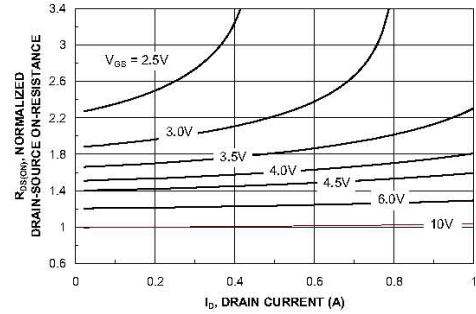


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

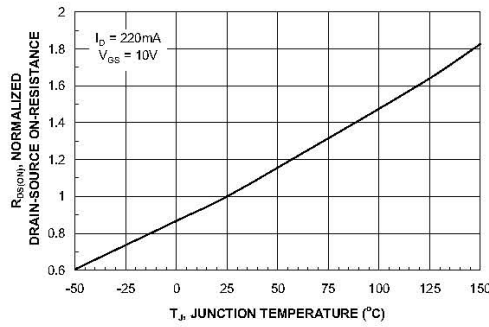


Figure 3. On-Resistance Variation with Temperature.

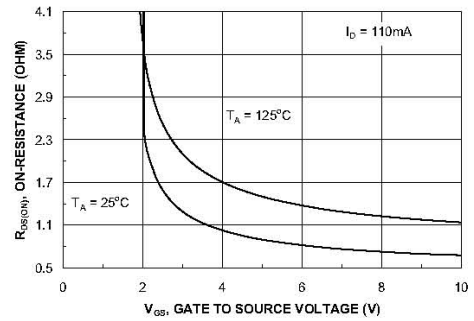


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

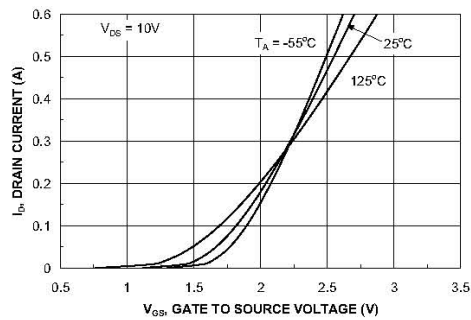


Figure 5. Transfer Characteristics.

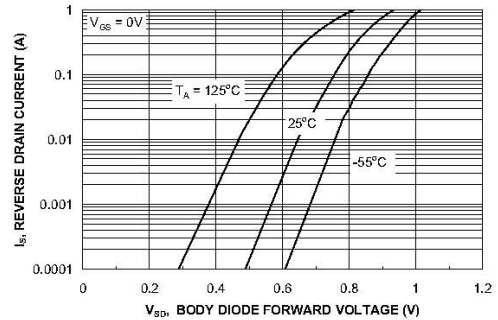


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

