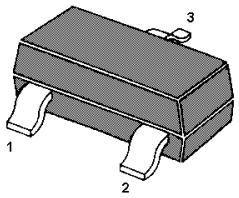
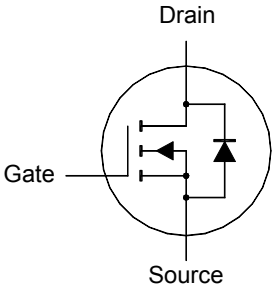
MMFTN138

N-Channel Logic Level Enhancement Mode Field Effect Transistor

for low voltage, low current switching applications



1. Gate 2. Source 3. Drain
SOT-23 Plastic Package



Absolute Maximum Ratings (T_a = 25 °C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	50	V
Drain-Gate Voltage (R_{GS} ≤ 20 KΩ)	V_{DGR}	50	V
Gate-Source Voltage - Continuous Gate-Source Voltage - Non-Repetitive (T_P < 50 μs)	V_{GSS}	± 20 ± 40	V
Drain Current - Continuous Drain Current - Pulsed	I_D	220 880	mA
Total Power Dissipation	P_{tot}	360	mW
Operating and Storage Temperature Range	T_j, T_{stg}	- 55 to + 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Juntion to Ambient	$R_{\theta JA}$	350	K/W

Characteristics at T_a = 25 °C unless otherwise specified

Parameter	Symbol	Min.	Max.	Unit
Drain-Source Breakdown Voltage at I_D = 250 µA	$V_{(BR)DSS}$	50	-	V
Drain-Source Leakage Current at V_{DS} = 50 V at V_{DS} = 30 V	I_{DSS}	- -	500 100	nA
Gate-Source Leakage Current at V_{GS} = ± 20 V	I_{GSS}	-	± 100	nA
Gate-Source Threshold Voltage at V_{GS} = V_{DS}, I_D = 1 mA	$V_{GS(th)}$	0.8	1.6	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 220 mA at V_{GS} = 4.5 V, I_D = 220 mA	$R_{DS(on)}$	- -	3.5 6	Ω
Forward Transconductance at V_{DS} = 10 V, I_D = 220 mA	g_{FS}	0.12	-	S
Input Capacitance at V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	60	pF
Output Capacitance at V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	25	pF
Reverse Transfer Capacitance at V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	10	pF
Turn-On Delay Time at V_{DD} = 30 V, I_D = 290 mA, V_{GS} = 10 V, R_G = 50 Ω	$t_{d(on)}$	-	8	ns
Turn-On Rise Time at V_{DD} = 30 V, I_D = 290 mA, V_{GS} = 10 V, R_G = 50 Ω	t_r	-	12	ns
Turn-Off Delay Time at V_{DD} = 30 V, I_D = 290 mA, V_{GS} = 10 V, R_G = 50 Ω	$t_{d(off)}$	-	16	ns
Turn-Off Fall Time at V_{DD} = 30 V, I_D = 290 mA, V_{GS} = 10 V, R_G = 50 Ω	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 mA	V_{SD}	-	1.4	V