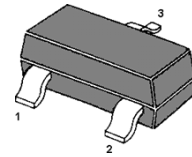
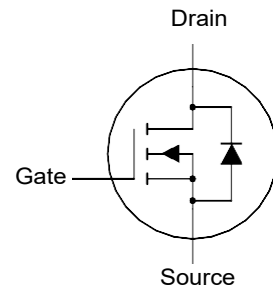


MFTN138 N-Channel Logic Level Enhancement Mode Field Effect Transistor

for low voltage, low current switching applications



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



Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$ 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	V_{GSS}	± 20	V
Gate-Source Voltage - Non-Repetitive ($T_P < 50\text{ }\mu\text{s}$)		± 40	
Drain Current - Continuous	I_D	220	mA
Drain Current - Pulsed		880	
Total Power Dissipation	P_{tot}	360	mW
Operating and Storage Temperature Range	T_j, T_s	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	347	K/W

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

Parameter	Symbol	Min.	Max.	Unit
Drain-Source Breakdown Voltage at $I_D = 250\text{ }\mu\text{A}$	$V_{(BR)DSS}$	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 $V_{DD} = 30\text{ V}$, $I_D = 290\text{ mA}$, $V_{GS} = 10\text{ V}$, $R_G = 50\text{ }\Omega$	$t_{d(on)}$	-	8	ns
Turn-On Rise Time at $V_{DD} = 30\text{ V}$, $I_D = 290\text{ mA}$, $V_{GS} = 10\text{ V}$, $R_G = 50\text{ }\Omega$	t_r	-	12	ns
Turn-Off Delay Time at $V_{DD} = 30\text{ V}$, $I_D = 290\text{ mA}$, $V_{GS} = 10\text{ V}$, $R_G = 50\text{ }\Omega$	$t_{d(off)}$	-	16	ns
Turn-Off Fall Time at $V_{DD} = 30\text{ V}$, $I_D = 290\text{ mA}$, $V_{GS} = 10\text{ V}$, $R_G = 50\text{ }\Omega$	t_f	-	22	ns

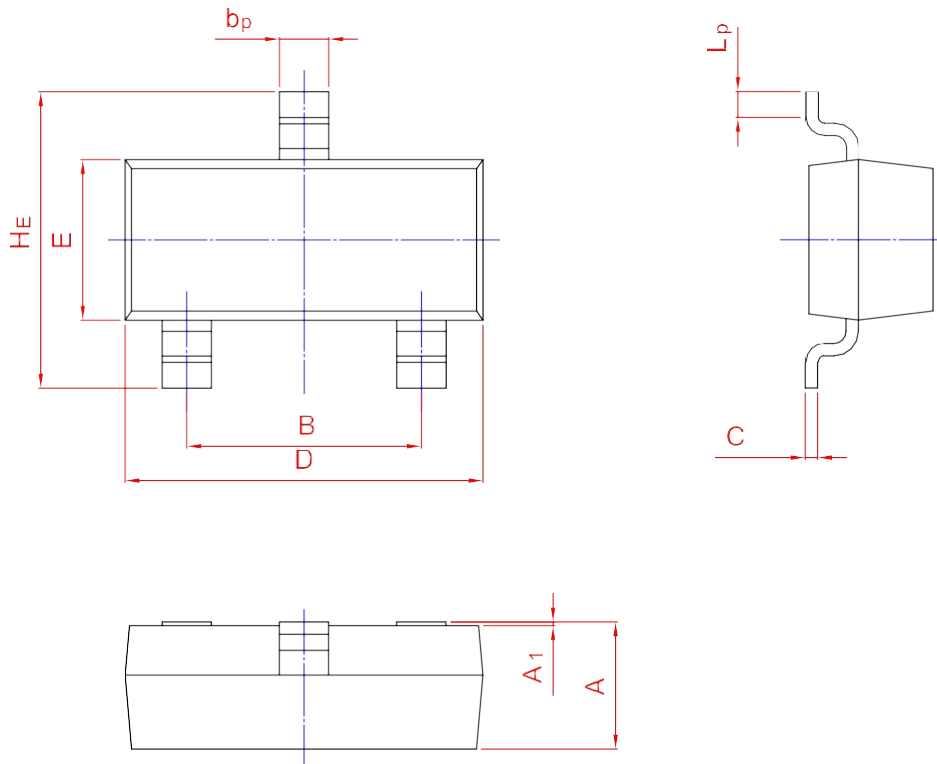
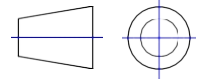
Drain-Source Diode Characteristics and Maximum Ratings

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_{GD}	-	1.4	V

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b _p	C	D	E	H _E	A ₁	L _p
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20