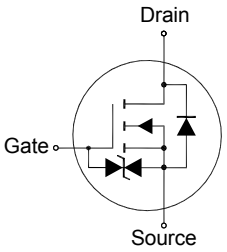
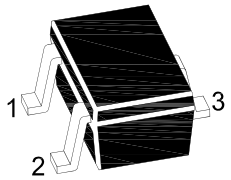
MMFTN290E

N-Channel Enhancement Mode MOSFET

Features

- Very fast switching
- ESD protected up to 2 KV





1.Gate 2.Source 3.Drain
SOT-523 Plastic Package

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current V_{GS} = 4.5 V, T_A = 25℃ V_{GS} = 4.5 V, T_A = 100℃	I_D	700 [1)] 440 [1)]	mA
Peak Drain Current (tp ≤ 10 μs)	I_{DM}	2.8	A
Source Current	I_S	300	mA
Power Dissipation	P_D	300 [1)]	mW
Junction Temperature Rang	T_J	- 55 to + 150	℃
Storage Temperature Rang	T_{stg}	- 65 to + 150	℃

[1)] Device mounted on an FR-4 PCB, single-sided copper, tin-plated, mounting pad for drain 1 cm^2.

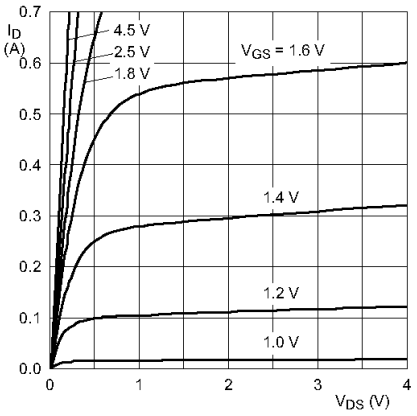
Thermal Characteristics

Parameter	Symbol	Max.	Unit
Maximum Thermal Resistance from Juntion to Ambient	$R_{\theta JA}$	510 [1)]	℃/W

[1)] Device mounted on an FR-4 (PCB), single-sided copper, tin-plated and standard footprint.

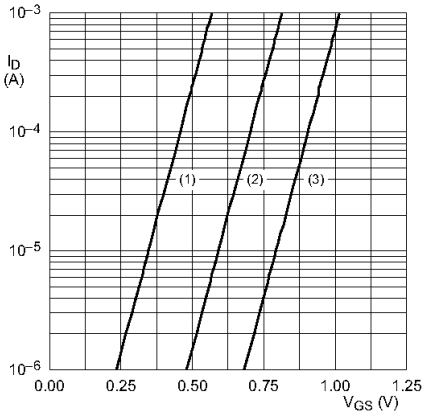
Characteristics at T_j = 25℃ unless otherwise specified

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	-	0.95	V
Drain-Source Leakage Current at V_{DS} = 20 V at V_{DS} = 20 V, T_j = 150℃	I_{DSS}	- -	- -	1 10	µA
Gate Leakage Current at V_{GS} = ± 8 V at V_{GS} = ± 4.5 V	I_{GSS}	- -	- -	± 2 ± 0.5	µA
Drain-Source On-State Resistance at V_{GS} = 4.5 V,I_D = 0.5 A at V_{GS} = 2.5 V, I_D = 0.4 A at V_{GS} = 1.8 V, I_D = 0.1 A at V_{GS} = 4.5 V,I_D = 0.5 A,T_J =150℃	$R_{DS(on)}$	- - - -	- - - -	380 620 1100 610	mΩ
Forward Transconductance at V_{DS} = 10 V, I_D = 0.2 A	$\lvert g_{FS} \rvert$	-	1.6	-	S
Diode Forward Voltage at I_S = 0.3 A, V_{GS}= 0 V	V_{SD}	0.48	-	1.2	V
Maximun Source Current	I_S	-	-	300	mA
Input Capacitance at V_{GS} = 0 V,V_{DS} = 10 V, f = 1 MHz	C_{iss}	-	-	83	pF
Output Capacitance at V_{GS} = 0 V,V_{DS} = 10 V, f = 1 MHz	C_{oss}	-	15	-	pF
Reverse Transfer Capacitance at V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz	C_{rss}	-	7	-	pF
Turn-On Delay Time at V_{GS} = 4.5 V, V_{DS} = 10 V, R_L= 250 Ω, R_G= 6 Ω	t_{on}	-	-	12	ns
Turn-On Rise Time at V_{GS} = 4.5 V, V_{DS} = 10 V, R_L= 250 Ω, R_G= 6 Ω	t_r	-	4	-	ns
Turn-Off Delay Time at V_{GS} = 4.5 V, V_{DS} = 10 V, R_L= 250 Ω, R_G= 6 Ω	t_{off}	-	-	172	ns
Turn-Off Fall Time at V_{GS} = 4.5 V, V_{DS} = 10 V, R_L= 250 Ω, R_G= 6 Ω	t_{off}	-	31	-	ns



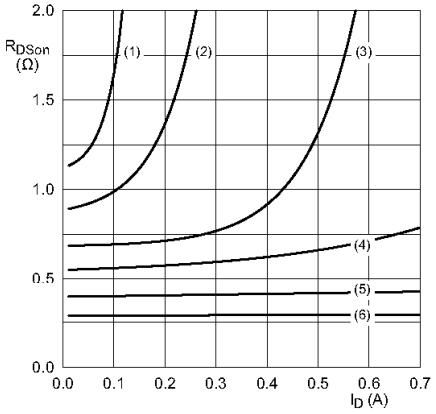
T_j = 25 °C

Output characteristics: drain current as a function of drain-source voltage; typical values



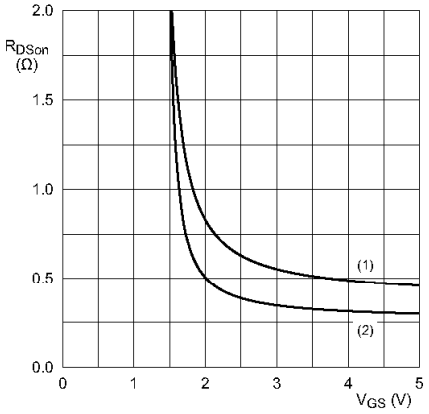
T_j = 25 °C; V_{DS} = 5 V
(1) minimum values
(2) typical values
(3) maximum values

Sub-threshold drain current as a function of gate-source voltage



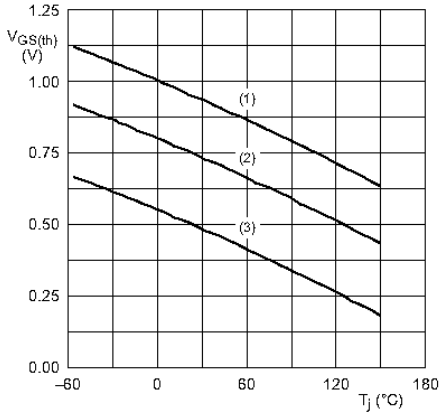
T_j = 25 °C
(1) V_{GS} = 1.3 V
(2) V_{GS} = 1.4 V
(3) V_{GS} = 1.6 V
(4) V_{GS} = 1.8 V
(5) V_{GS} = 2.5 V
(6) V_{GS} = 4.5 V

Drain-source on-state resistance as a function of drain current; typical values



I_D = 400 mA
(1) T_j = 150 °C
(2) T_j = 25 °C

Drain-source on-state resistance as a function of gate-source voltage; typical values



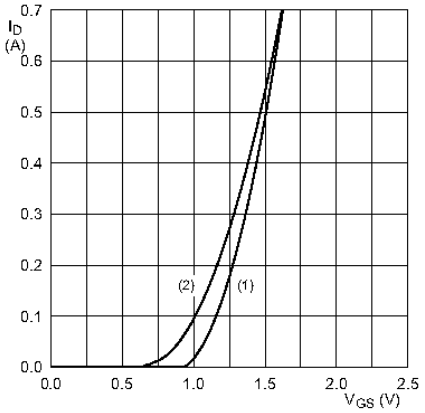
I_D = 0.25 mA; V_{DS} = V_{GS}

(1) maximum values

(2) typical values

(3) minimum values

Gate-source threshold voltage as a function of junction temperature



$V_{DS} > I_D \times R_{DSon}$

(1) T_j = 25 °C

(2) T_j = 150 °C

Transfer characteristics: drain current as a function of gate-source voltage; typical values