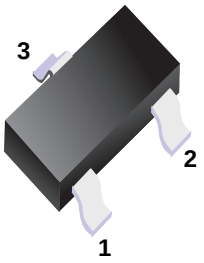
■ N-Channel Enhancement Mode MOSFET

■ Features

- Very fast switching
- ESD protected up to 2 KV



■ **Simplified outline(SOT-523)**

■ **Marking Code: C**

■ Absolute Maximum Ratings Ta = 25℃

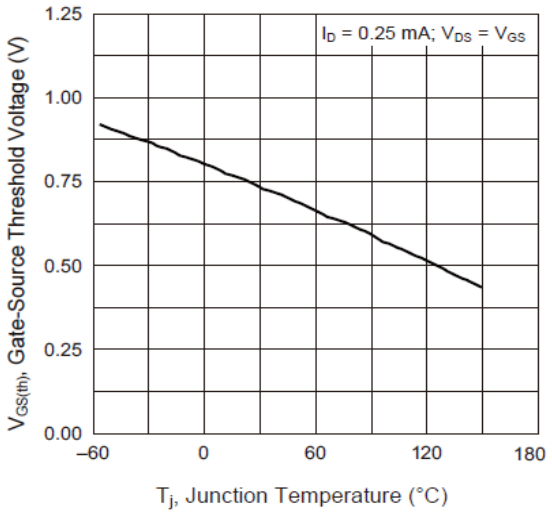
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current at V_{GS} = 4.5 V T_a = 25℃ T_a = 100℃	I_D	700 [1] 440 [1]	mA
Peak Drain Current, Pulsed (tp ≤ 10 μs)	I_{DM}	2.8	A
Power Dissipation	P_D	300 [1]	mW
Maximum Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	510 [2]	℃/W
Junction Temperature Rang	T_j	- 55 to + 150	℃
Storage Temperature Rang	T_{stg}	- 65 to + 150	℃

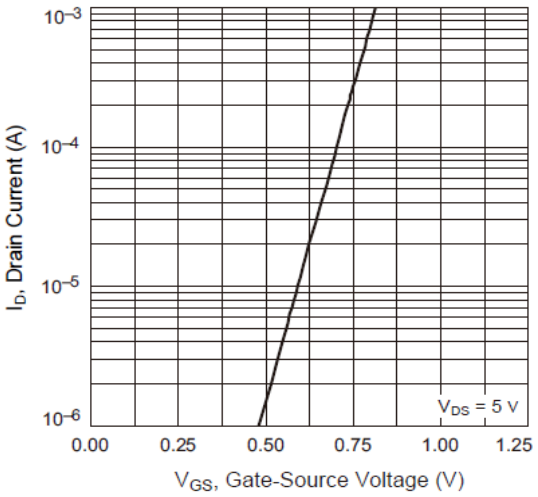
[1] Device mounted on an FR-4 (PCB), single-sided copper, tin-plated, mounting pad for drain 1 cm^2.

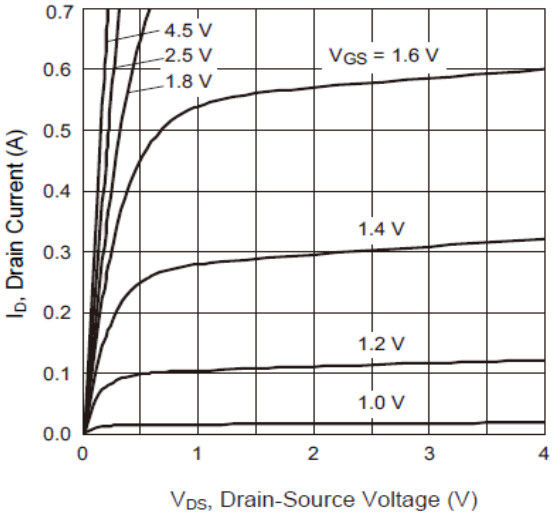
[2] Device mounted on an FR-4 (PCB), single-sided copper, tin-plated and standard footprint.

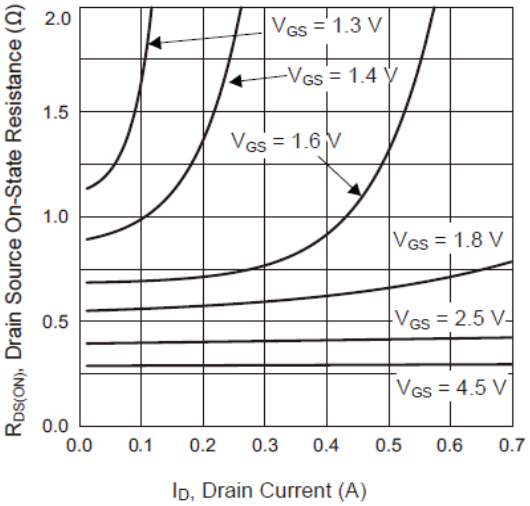
■ Electrical Characteristics Ta = 25℃

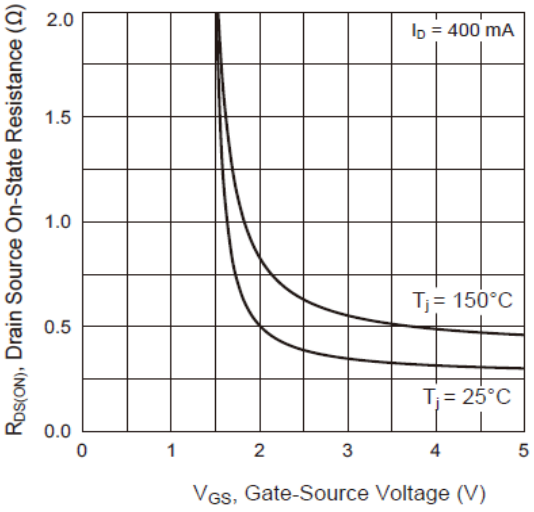
Parameter	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage at I_D = 250 μA	BV_{DSS}	20	-	-	V
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_D = 250 μA	V_{GSth}	0.5	-	0.95	V
Drain-Source Leakage Current at V_{DS} = 20 V	I_{DSS}	-	-	1	μA
Gate Leakage Current at V_{GS} = ± 8 V at V_{GS} = ± 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	$R_{DS(on)}$	- - -	- - -	380 620 1100	mΩ
Forward Transconductance at V_{DS} = 10 V, I_D = 0.2 A	$\lvert g_{FS} \rvert$	-	1.6	-	S
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
Diode Forward Voltage at I_S = 0.3 A, V_{GS} = 0 V	V_{SD}	0.48	-	1.2	V


I_D = 0.25 mA; V_{DS} = V_{GS}
$V_{GS(th)}$, Gate-Source Threshold Voltage (V)
1.25
1.00
0.75
0.50
0.25
0.00
−60
0
60
120
180
T_j, Junction Temperature (°C)

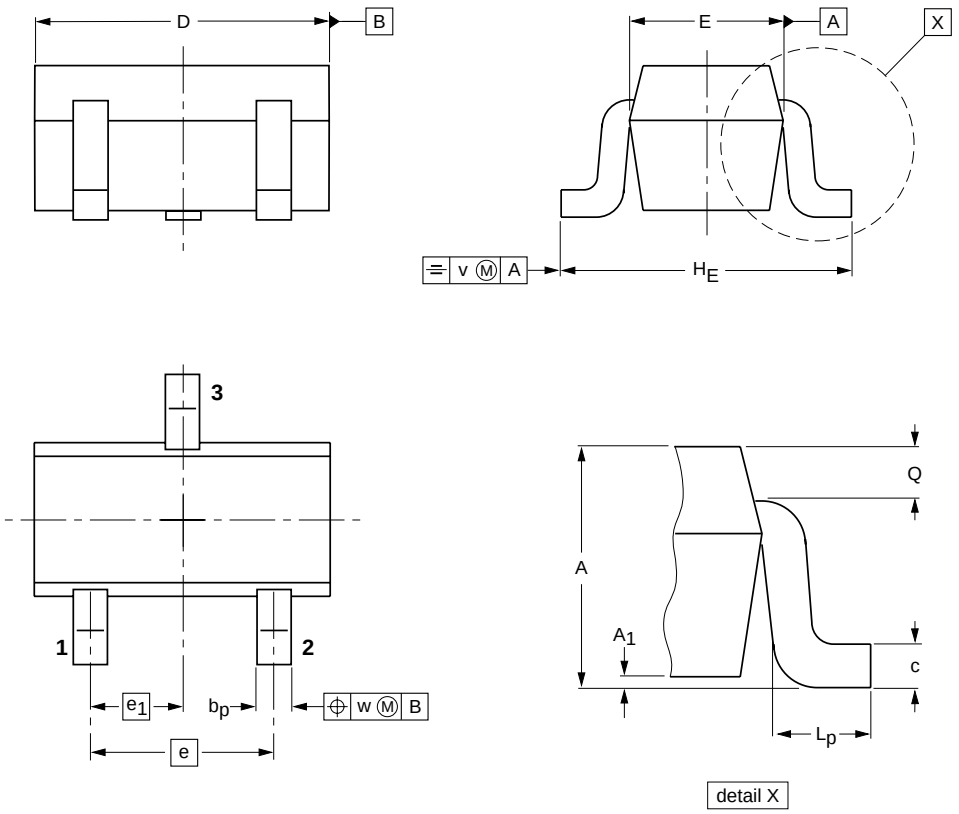

I_D, Drain Current (A)
10^{-3}
10^{-4}
10^{-5}
10^{-6}
V_{DS} = 5 V
0.00
0.25
0.50
0.75
1.00
1.25
V_{GS}, Gate-Source Voltage (V)


I_D, Drain Current (A)
4.5 V
2.5 V
1.8 V
V_{GS} = 1.6 V
1.4 V
1.2 V
1.0 V
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
1
2
3
4
V_{DS}, Drain-Source Voltage (V)


$R_{DS(ON)}$, Drain Source On-State Resistance (Ω)
V_{GS} = 1.3 V
V_{GS} = 1.4 V
V_{GS} = 1.6 V
V_{GS} = 1.8 V
V_{GS} = 2.5 V
V_{GS} = 4.5 V
2.0
1.5
1.0
0.5
0.0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
I_D, Drain Current (A)


$R_{DS(ON)}$, Drain Source On-State Resistance (Ω)
I_D = 400 mA
T_j = 150°C
T_j = 25°C
2.0
1.5
1.0
0.5
0.0
0
1
2
3
4
5
V_{GS}, Gate-Source Voltage (V)

Package Outline SOT-523



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	0.95 0.60	0.1	0.30 0.15	0.25 0.10	1.8 1.4	0.9 0.7	1	0.5	1.75 1.45	0.45 0.15	0.23 0.13	0.2	0.2

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-523	Tape/Reel,7”reel	3000	EIA-481-1