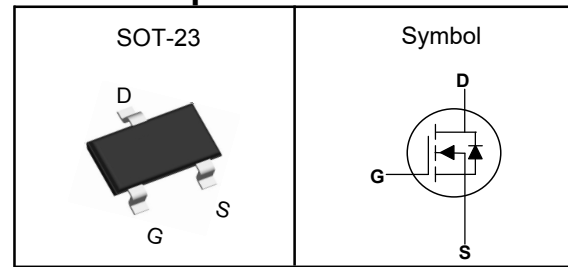# N-Channel Enhancement Mode MOSFET

Features

- Low Rdson for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description

SOT-23	Symbol
D G S	D G S

V_{DSS}	100	V
$R_{DS(ON)-Typ}$	300	mΩ
I_D	1	A

Absolute Maximum Ratings (T$_A$=25℃, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	-55 to 150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
I_{DM} [1]	Pulse Drain Current Tested	4	A
I_D	Continuous Drain Current	1	A
P_D	Maximum Power Dissipation	1.4	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	125	℃/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T$_J$=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=250uA	100	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=100V, V$_{GS}$=0V	---	---	1	uA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	1.0	---	2.9	V
I$_{GSS}$	Gate Leakage Current	V$_{GS}$=±20V, V$_{DS}$=0V	---	---	±100	nA
R$_{DS(ON)}$	Drain-Source On-state Resistance	V$_{GS}$=10V , I$_D$=1A	---	300	380	mΩ
		V$_{GS}$=4.5V , I$_D$=0.8A	---	350	450	mΩ
Dynamic Characteristics[⑤]						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=50V, Freq.=1MHz	---	100	---	pF
C$_{oss}$	Output Capacitance		---	13	---	
C$_{rss}$	Reverse Transfer Capacitance		---	5	---	
T$_{d(on)}$	Turn-on Delay Time	V$_{DD}$=50V ,R$_G$=3Ω, V$_{GS}$=10V ,R$_L$=50Ω	---	5	---	nS
T$_r$	Turn-on Rise Time		---	4		
T$_{d(off)}$	Turn-off Delay Time		---	12	---	
T$_f$	Turn-off Fall Time		---	5	---	
gfs	Forward Transconductance	V$_{DS}$=5V , I$_D$=1A	---	3	---	S
Q$_g$	Total Gate Charge	V$_{DS}$=50V , V$_{GS}$=10V , I$_D$=1A	---	2.8	---	nC
Q$_{gs}$	Gate-Source Charge		---	0.4	---	
Q$_{gd}$	Gate-Drain Charge		---	0.8	---	
Source-Drain Characteristics （T$_J$=25℃）						
V$_{SD}$[④]	Diode Forward Voltage	I$_S$=1A, V$_{GS}$=0V	---	---	1.2	V

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET
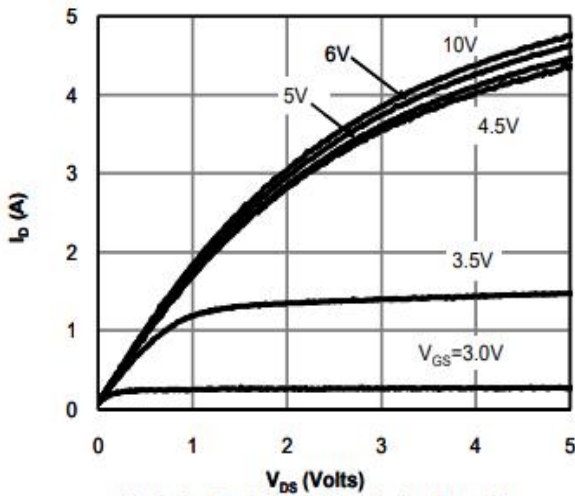
Typical Characteristics
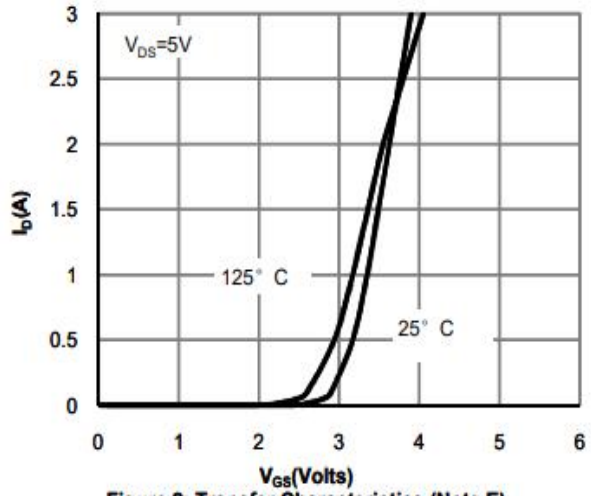

Fig 1: On-Region Characteristics (Note E)

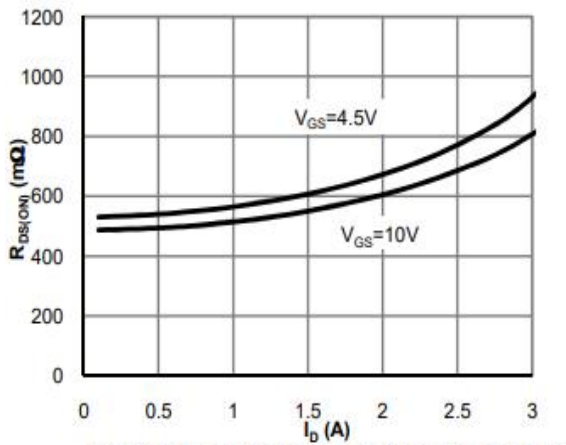Figure 2: Transfer Characteristics (Note E)

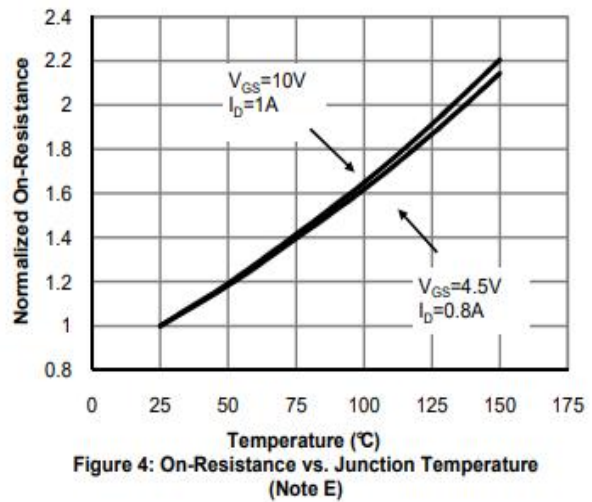Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

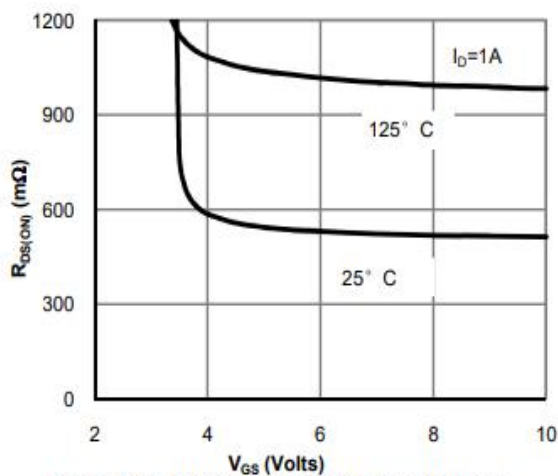Figure 4: On-Resistance vs. Junction Temperature (Note E)

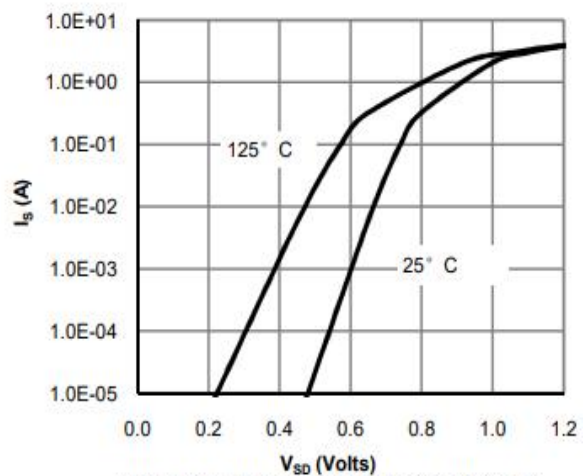Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

Figure 6: Body-Diode Characteristics (Note E)
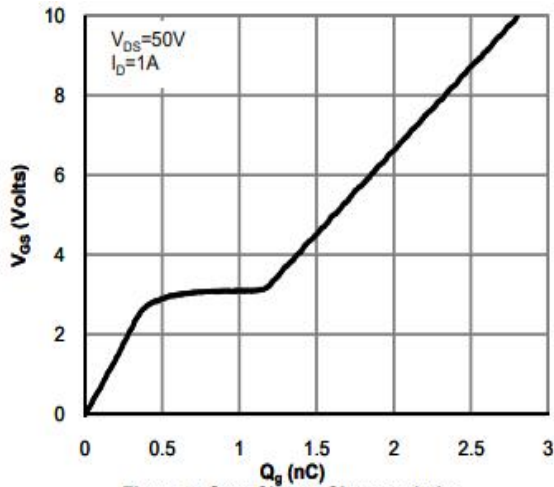
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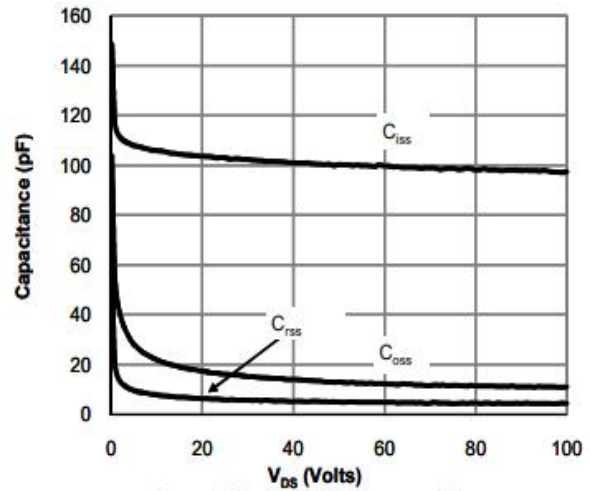Figure 7: Gate-Charge Characteristics
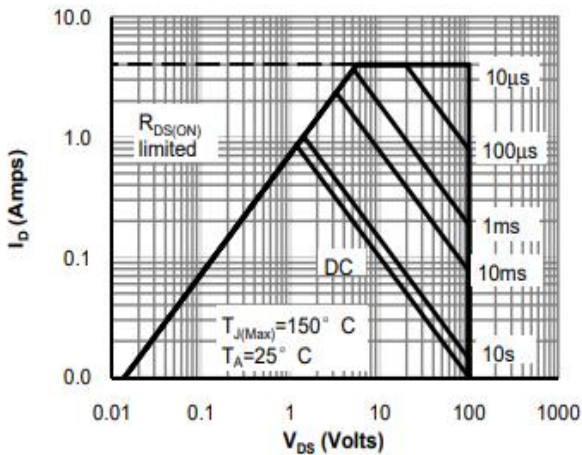

Figure 8: Capacitance Characteristics

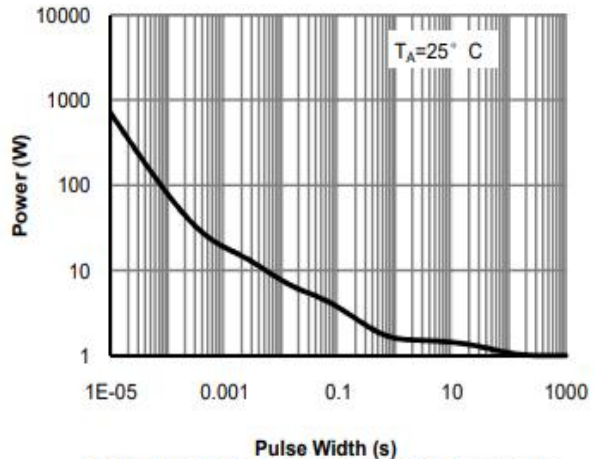Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

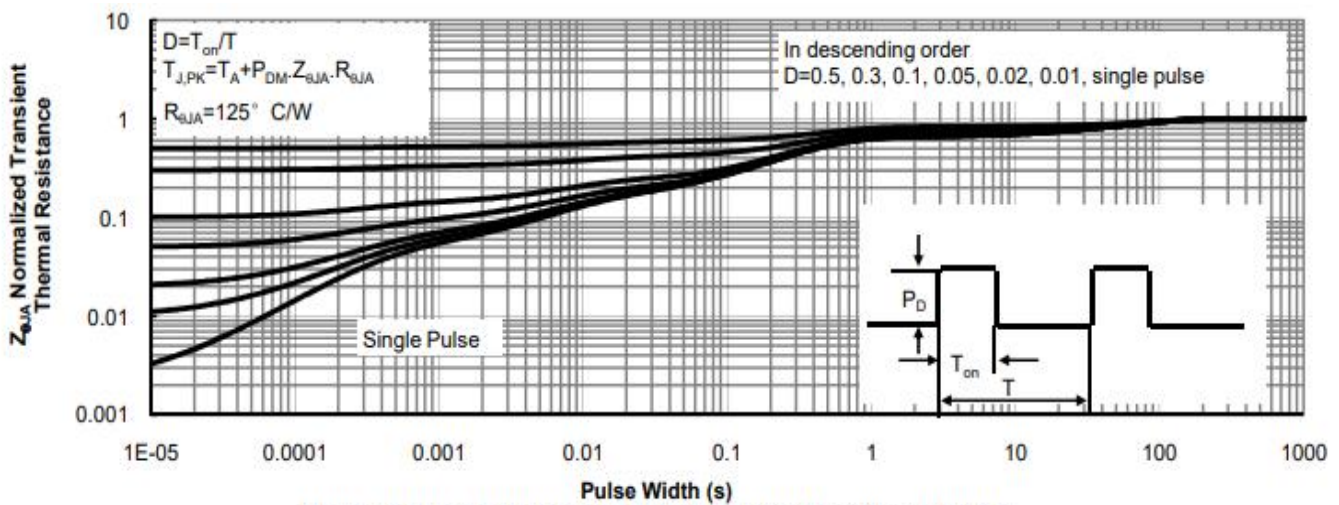Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

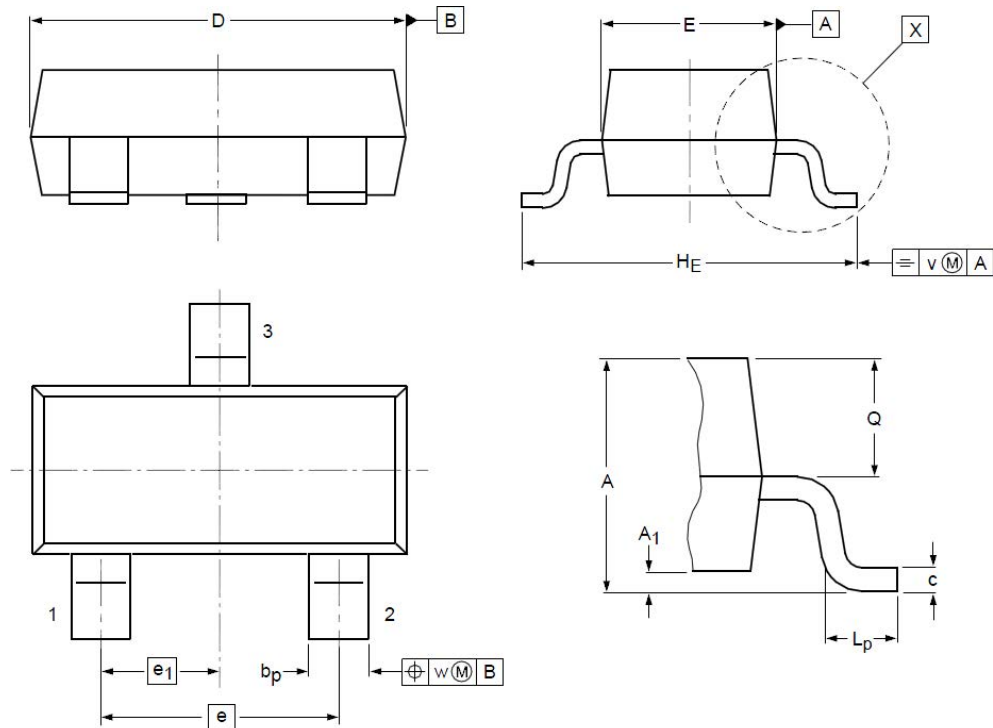
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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SOT23 Package Outline Dimensions

Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.05	1.20	e_1	--	0.95	--
A_1	0.01	0.05	0.10	H_E	2.10	2.40	2.50
b_p	0.38	0.42	0.48	L_P	0.40	0.50	0.60
c	0.09	0.13	0.15	Q	0.45	0.49	0.55
D	2.80	2.92	3.00	V	--	0.20	--
E	1.20	1.33	1.40	W	--	0.10	--
e	--	1.90	--				