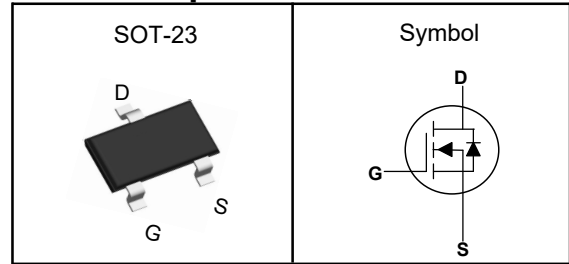


N-Channel Enhancement Mode MOSFET

Features

- Low $R_{ds(on)}$ for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Pin Description



Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	20	V
$R_{DS(ON)-Typ}$	30	m Ω
I_D	4	A

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 12	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	10	A
I_D	Continuous Drain Current	4	A
P_D	Maximum Power Dissipation	1.0	W

Thermal Characteristics

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

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

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

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



N-Channel Enhancement Mode MOSFET

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

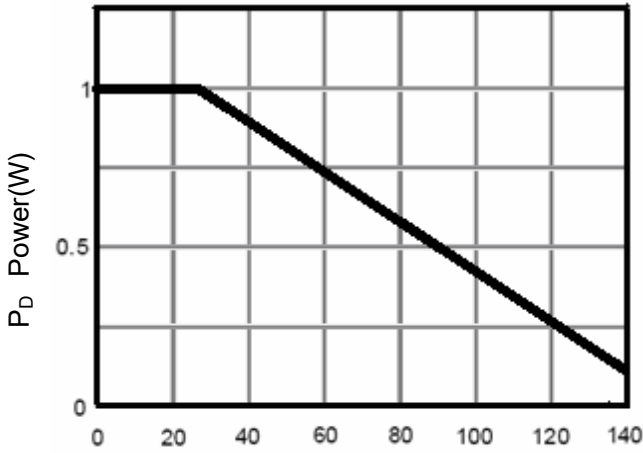
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	---	1.2	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_D=2.9A$	---	30	45	$m\Omega$
		$V_{GS}=2.5V, I_D=2.5A$	---	37	59	$m\Omega$
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=10V, \text{Freq.}=1\text{MHz}$	---	300	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	80	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=10V, R_G=6\Omega, V_{GS}=4.5V, I_D=2.9A$	---	10	---	nS
T_r	Turn-on Rise Time		---	50	---	
$T_{d(off)}$	Turn-off Delay Time		---	17	---	
T_f	Turn-off Fall Time		---	10	---	
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=2.9A$	---	8	---	S
Q_g	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=2.9A$	---	4	---	nC
Q_{gs}	Gate-Source Charge		---	0.65	---	
Q_{gd}	Gate-Drain Charge		---	1.2	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD} ^④	Diode Forward Voltage	$I_S=2.9A, V_{GS}=0V$	---	0.75	1.2	V

Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

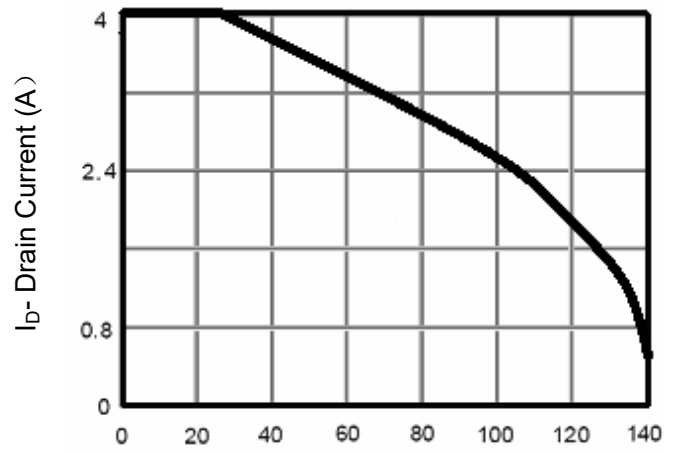
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET

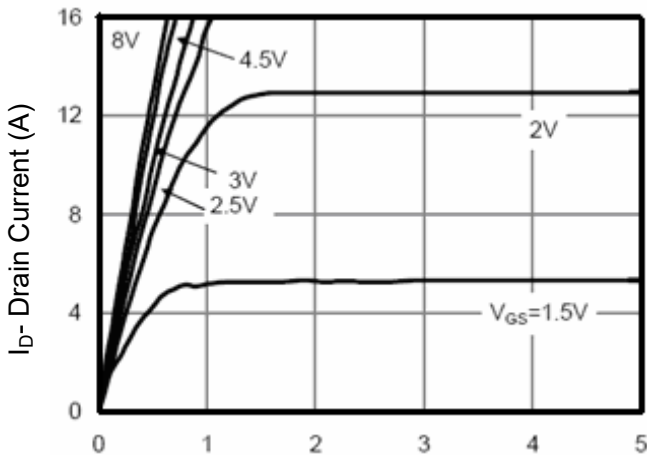
Typical Characteristics



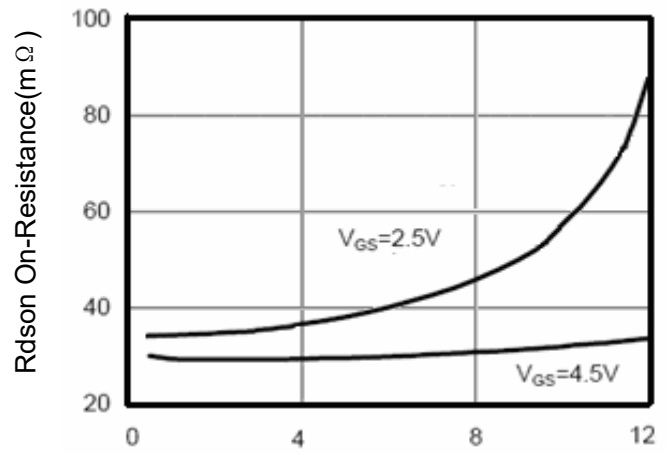
T_J-Junction Temperature(°C)
Figure 1 Power Dissipation



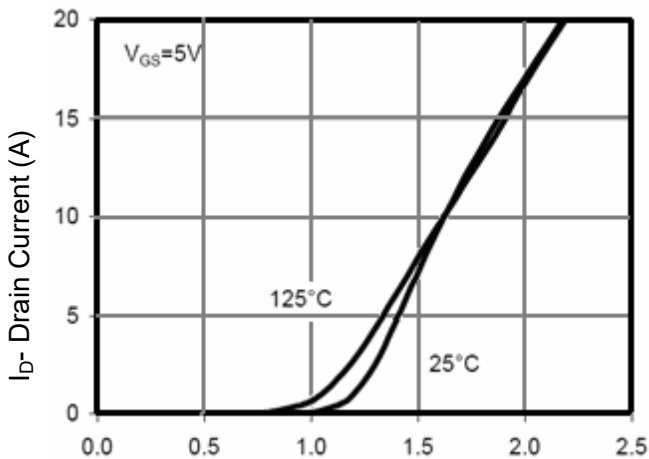
T_J-Junction Temperature(°C)
Figure 2 Drain Current



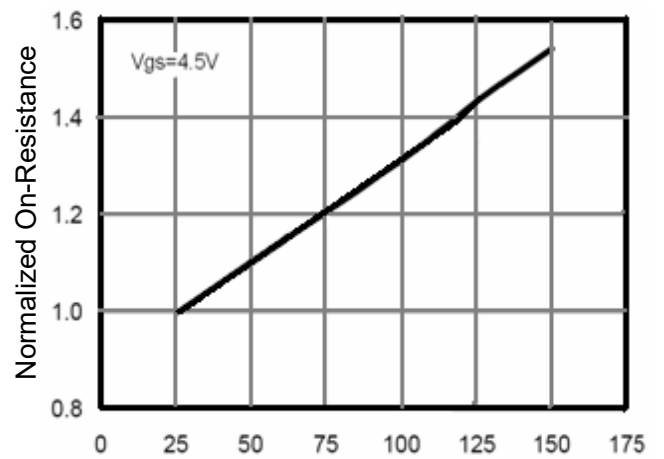
V_{DS} Drain-Source Voltage (V)
Figure 3 Output Characteristics



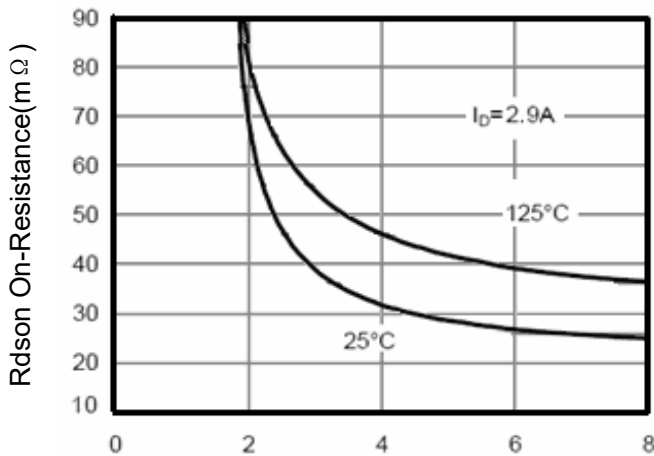
I_D- Drain Current (A)
Figure 4 Drain-Source On-Resistance



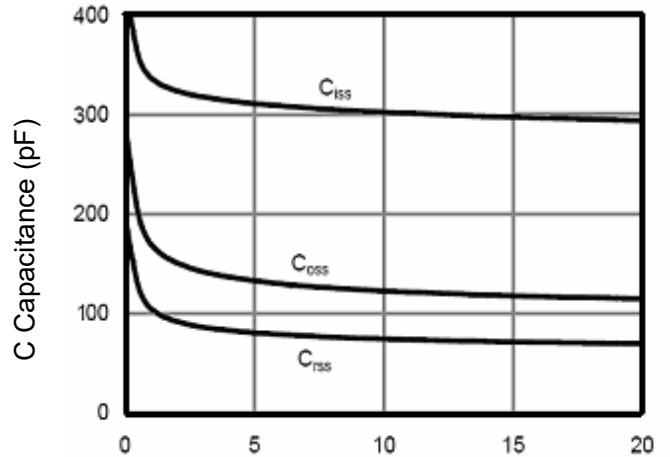
V_{GS} Gate-Source Voltage (V)
Figure 5 Transfer Characteristics



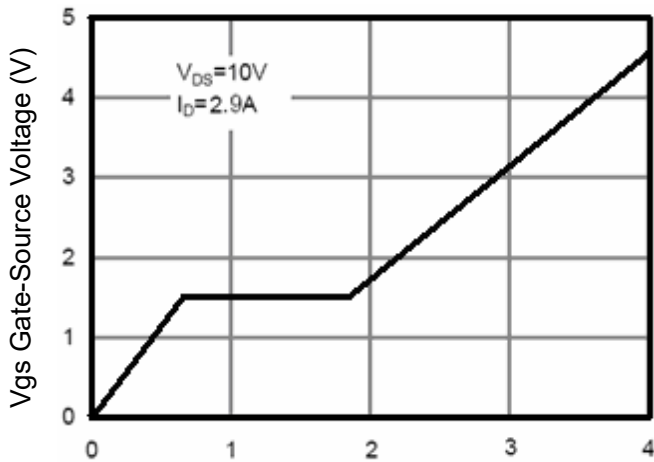
T_J-Junction Temperature(°C)
Figure 6 Drain-Source On-Resistance

N-Channel Enhancement Mode MOSFET


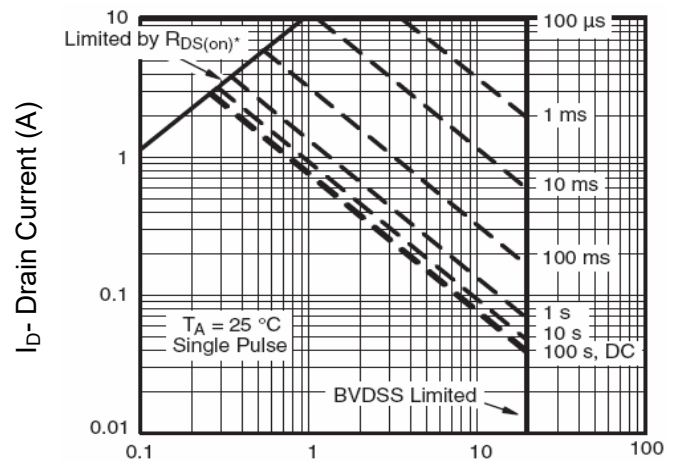
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 9 Gate Charge



Vds Drain-Source Voltage (V)
Figure 10 Safe Operation Area

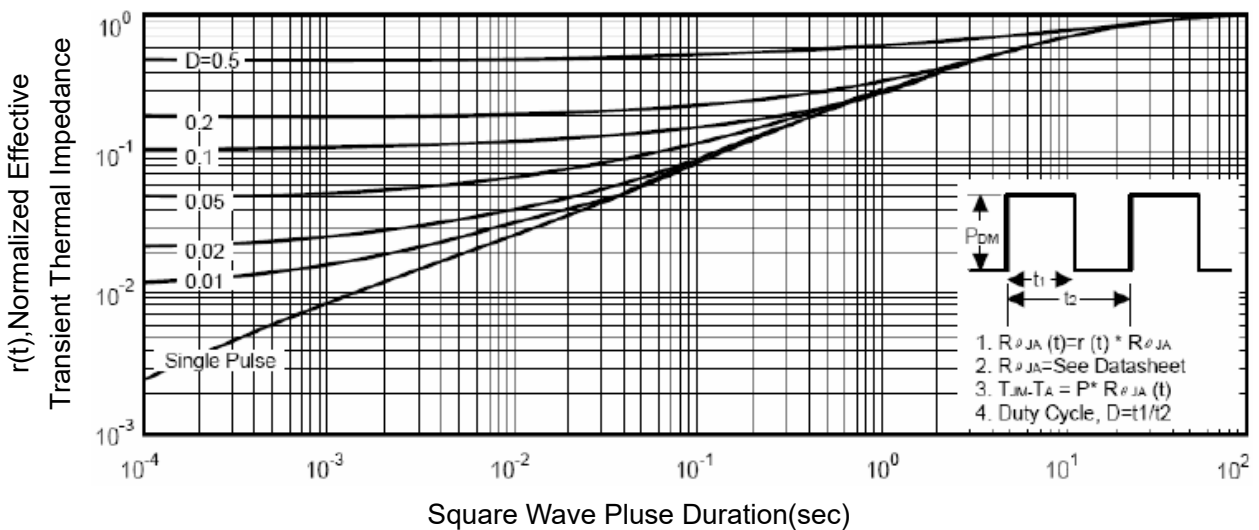
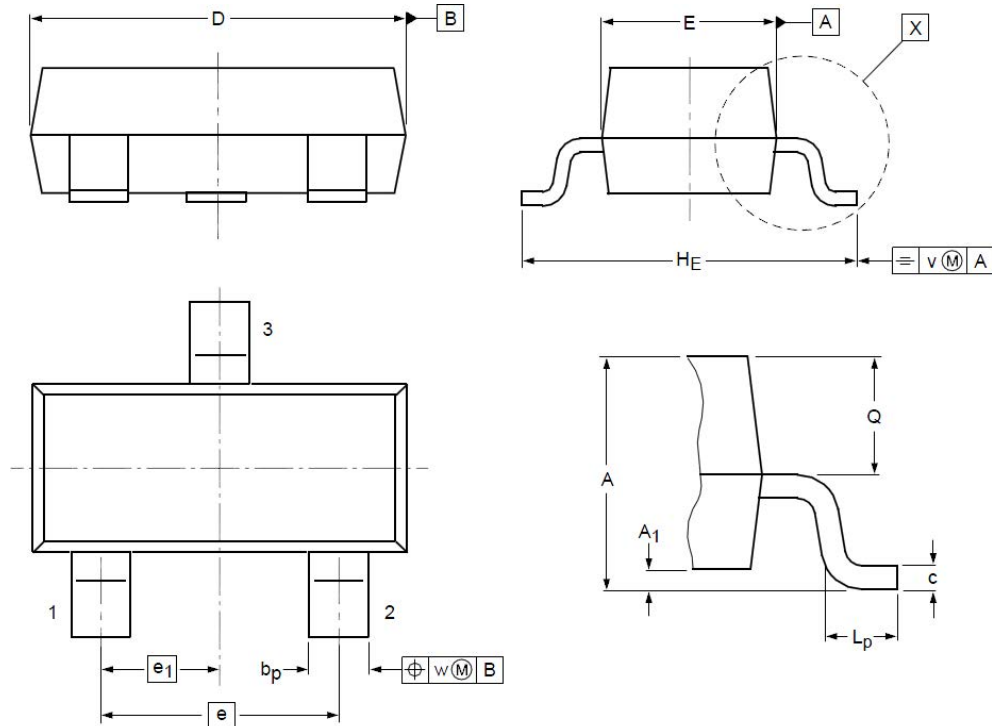


Figure 11 Normalized Maximum Transient Thermal Impedance

N-Channel Enhancement Mode MOSFET
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	e₁	--	0.95	--
A₁	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	--				