

N-Channel Enhancement Mode MOSFET

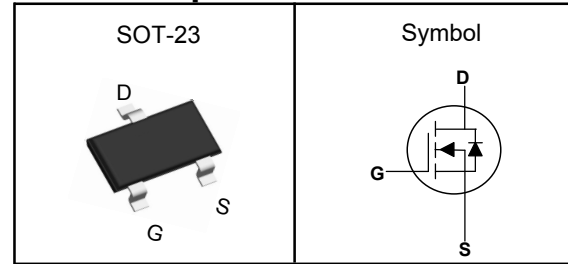
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V _{DSS}	40	V
R _{DS(ON)-Typ}	32	mΩ
I _D	4	A

Absolute Maximum Ratings (T_A=25°C, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V _{DSS}	Drain-Source Voltage	40	V
V _{GSS}	Gate-Source Voltage	±20	V
T _J	Maximum Junction Temperature	-55 to 150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
I _{DM} ^①	Pulse Drain Current Tested	16	A
I _D	Continuous Drain Current	4	A
P _D	Maximum Power Dissipation	1.04	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJA}	Thermal Resistance-Junction to Ambient	104	°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 1in² FR-4 board with 1oz.



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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	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	---	3.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=4A$	---	32	40	$m\Omega$
		$V_{GS}=4.5V, I_D=3.5A$	---	50	65	$m\Omega$
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Freq.=1MHz	---	558	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=20V, V_{GS}=10V,$ $R_G=1\Omega$	---	12	---	nS
T_r	Turn-on Rise Time		---	49	---	
$T_{d(off)}$	Turn-off Delay Time		---	37	---	
T_f	Turn-off Fall Time		---	10	---	
g_{fs}	Forward Transconductance	$V_{DS}=15V, I_D=2A$	---	---	---	S
Q_g	Total Gate Charge	$V_{DS}=20V,$ $V_{GS}=10V,$ Freq.=1MHz	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	1.4	---	
Q_{gd}	Gate-Drain Charge		---	1.9	---	
Source-Drain Characteristics ($T_J=25^\circ\text{C}$)						
V_{SD}	Diode Forward Voltage ₂	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V

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

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

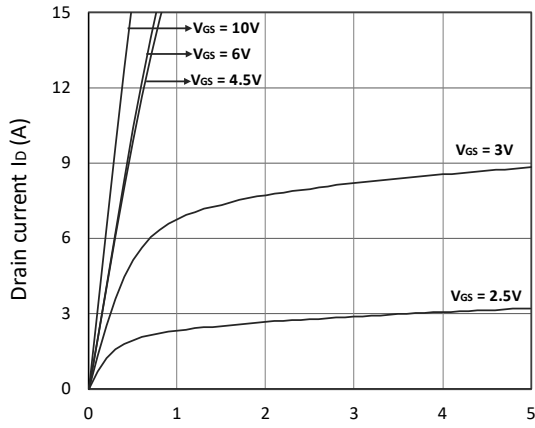
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Typical Characteristics


Figure 1. Output Characteristics

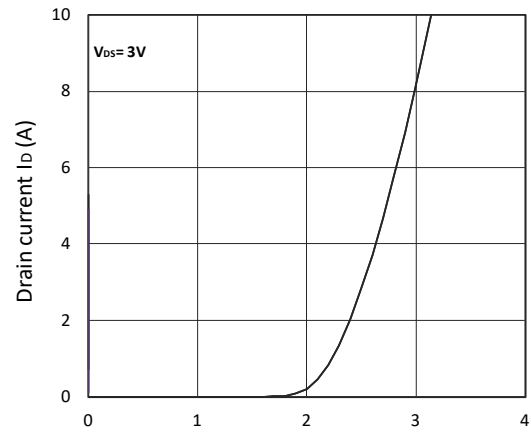


Figure 2. Transfer Characteristics

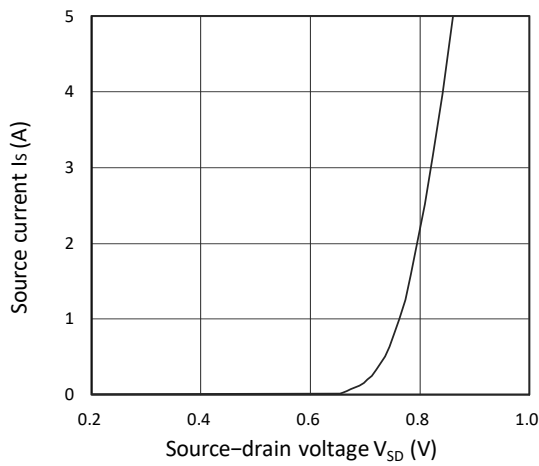
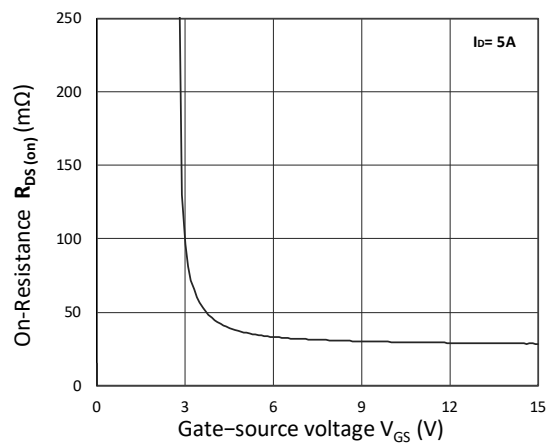
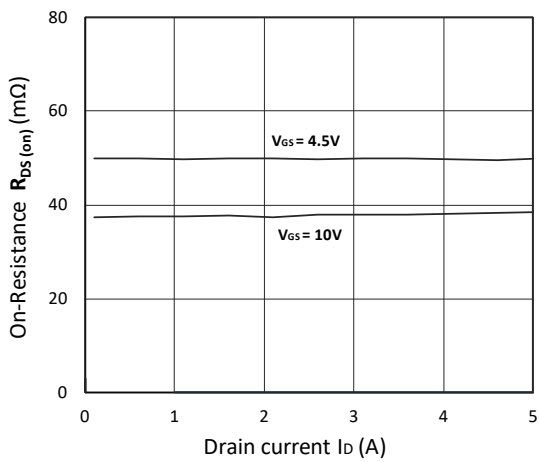
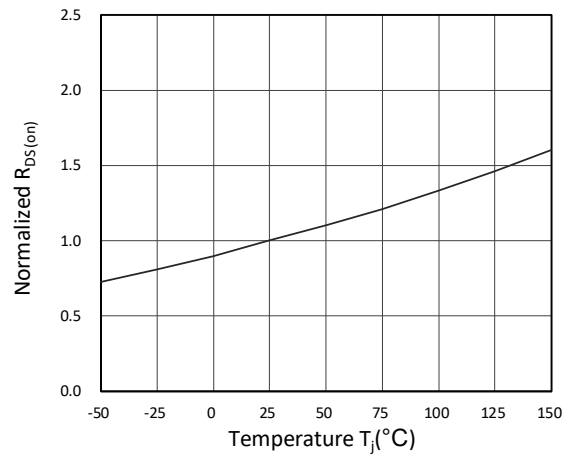


Figure 3. Forward Characteristics of Reverse


 Figure 4. $R_{DS(ON)}$ vs. V_{GS}

 Figure 5. $R_{DS(ON)}$ vs. I_D

 Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

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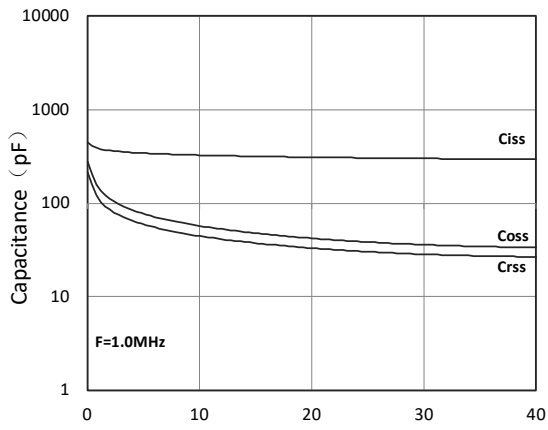


Figure 7. Capacitance Characteristics

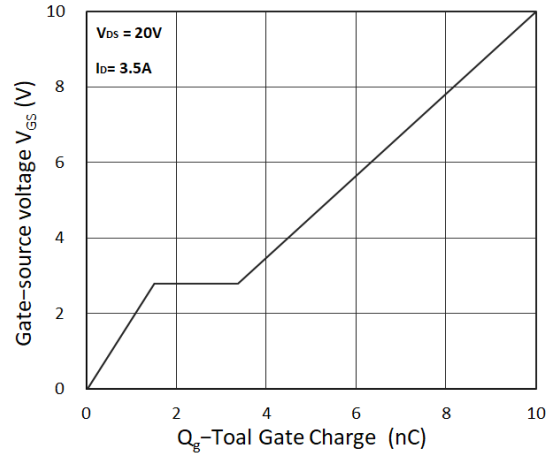
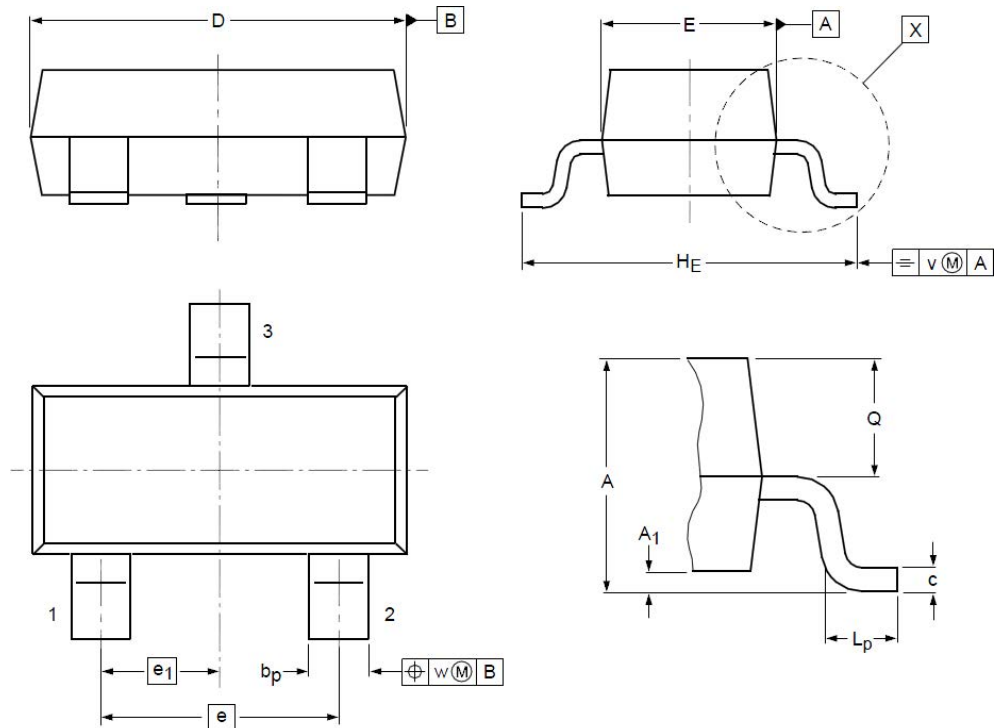


Figure 8. Gate Charge Characteristics

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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	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	--				