

N-Channel Enhancement Mode MOSFET

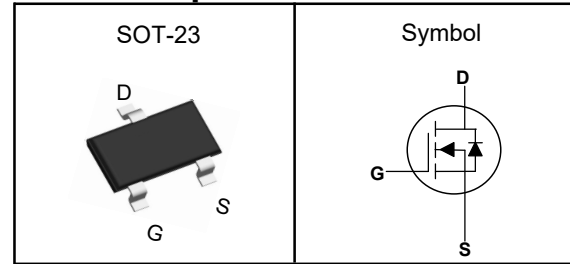
Features

- 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}	50	V
$R_{DS(ON)-Typ}$	1000	m Ω
I_D	0.22	A

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	50	V
V_{GSS}	Gate-Source Voltage	± 20	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	0.88	A
I_D	Continuous Drain Current	0.22	A
P_D	Maximum Power Dissipation	0.35	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	350	$^\circ\text{C}/\text{W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



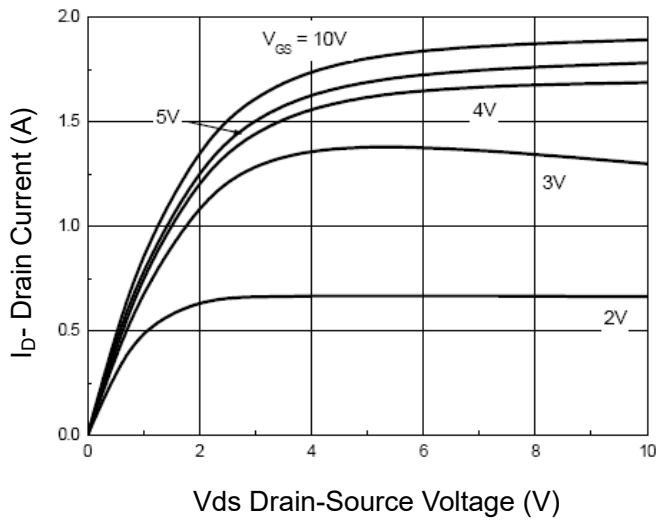
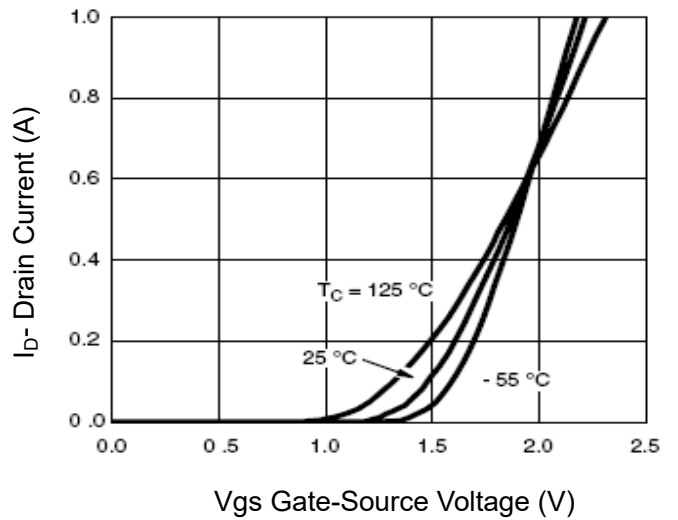
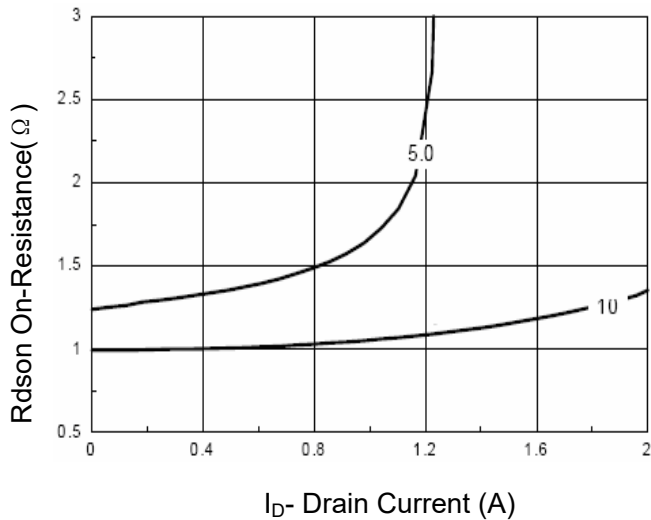
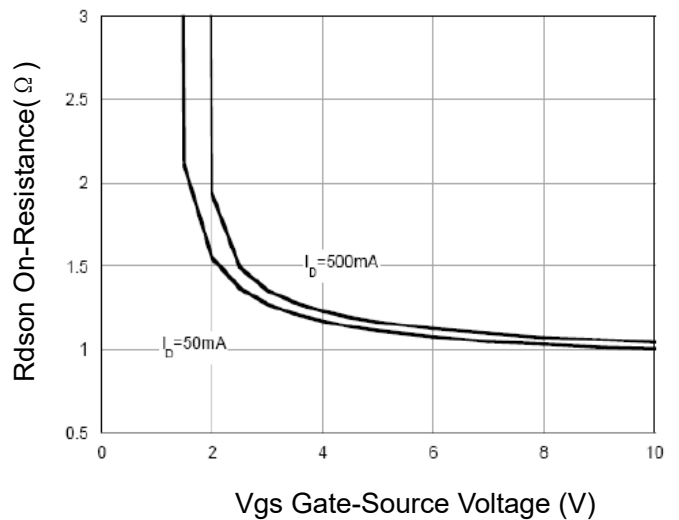
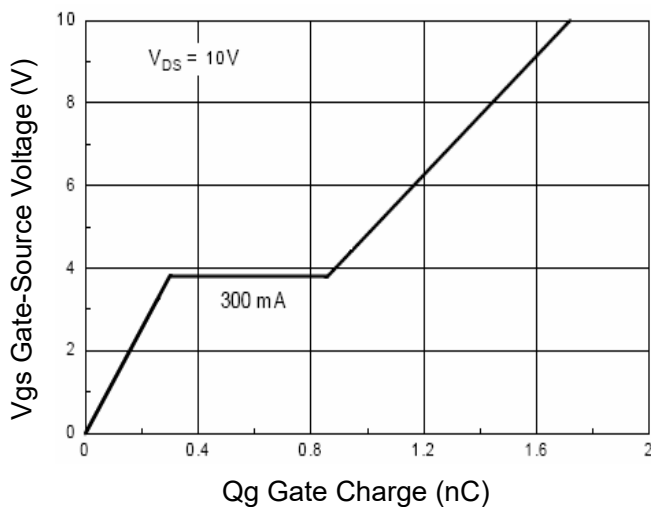
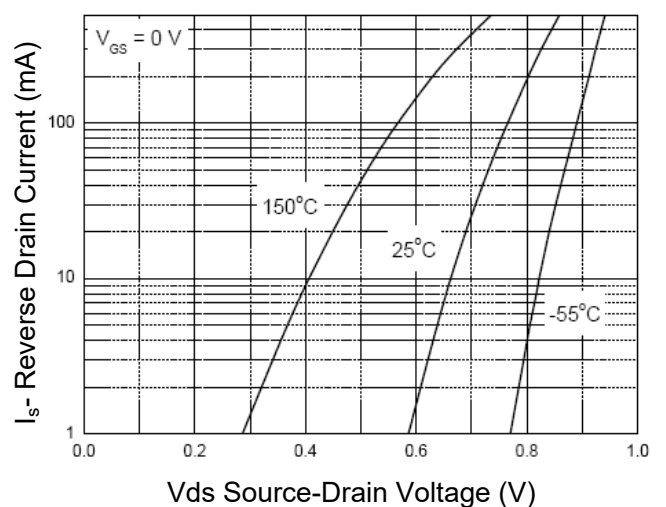
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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	50	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=50V, V_{GS}=0V$	---	---	0.5	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8	---	1.6	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=0.5A$	---	1000	2000	$m\Omega$
		$V_{GS}=5V, I_D=0.05A$	---	1200	3000	$m\Omega$
Dynamic Characteristics^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V, \text{Freq.}=1\text{MHz}$	---	27	---	pF
C_{oss}	Output Capacitance		---	12	---	
C_{rss}	Reverse Transfer Capacitance		---	6	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, V_{GS}=10V, R_G=6\Omega, I_D=0.22A$	---	2.5	---	nS
T_r	Turn-on Rise Time		---	6	---	
$T_{d(off)}$	Turn-off Delay Time		---	20	---	
T_f	Turn-off Fall Time		---	7	---	
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=0.2A$	0.12	---	---	S
Q_g	Total Gate Charge	$V_{DS}=25V, V_{GS}=10V, I_D=0.3A$	---	1.7	---	nC
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=0.22A, T_J=25^{\circ}\text{C}$	---	---	1.3	V
I_S	Continuous Source Current ²		---	---	0.22	A

Note ④ : Pulse test (pulse width $\leq 300\mu s$, 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 Drain-Source On-Resistance

Figure 4 Rdson vs VGS

Figure 5 Gate Charge

Figure 6 Source-Drain Diode Forward

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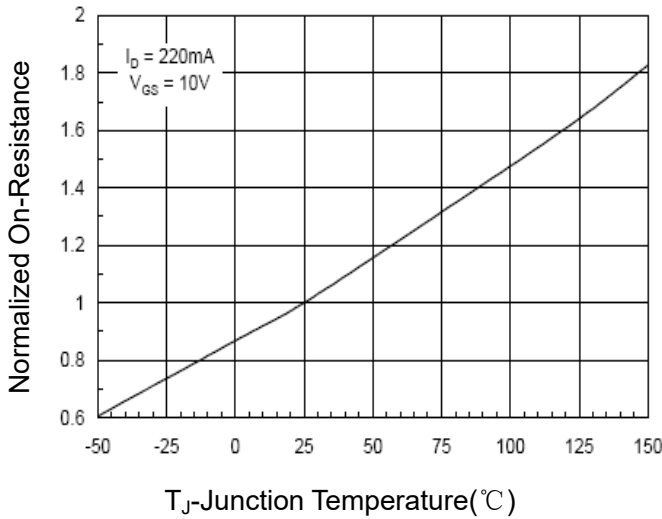


Figure 7 Drain-Source On-Resistance

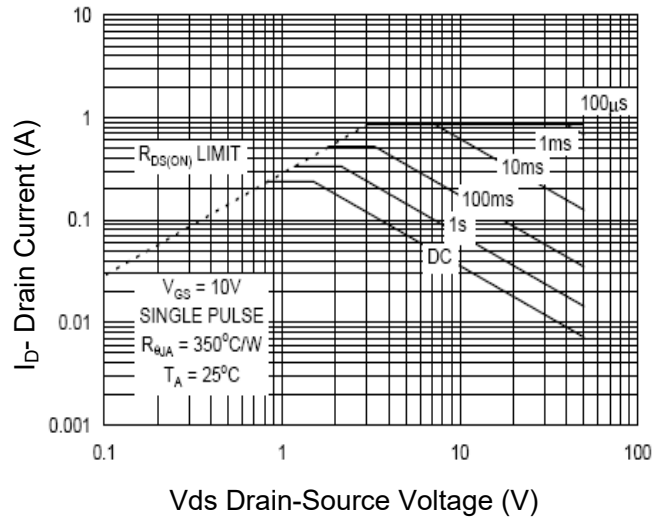


Figure 8 Safe Operation Area

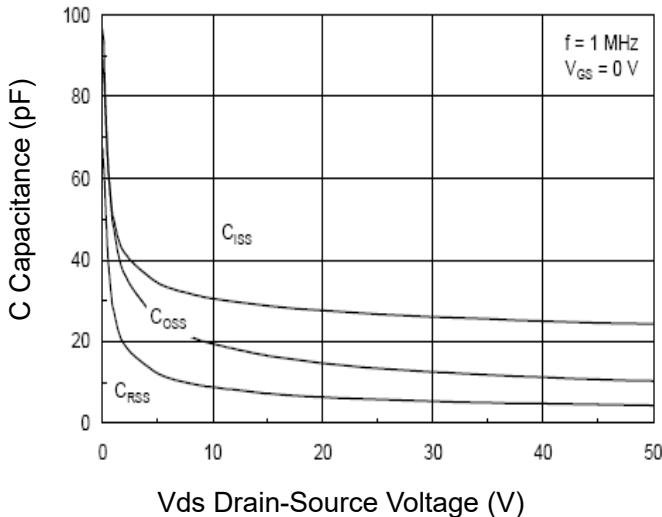


Figure 9 Capacitance vs Vds

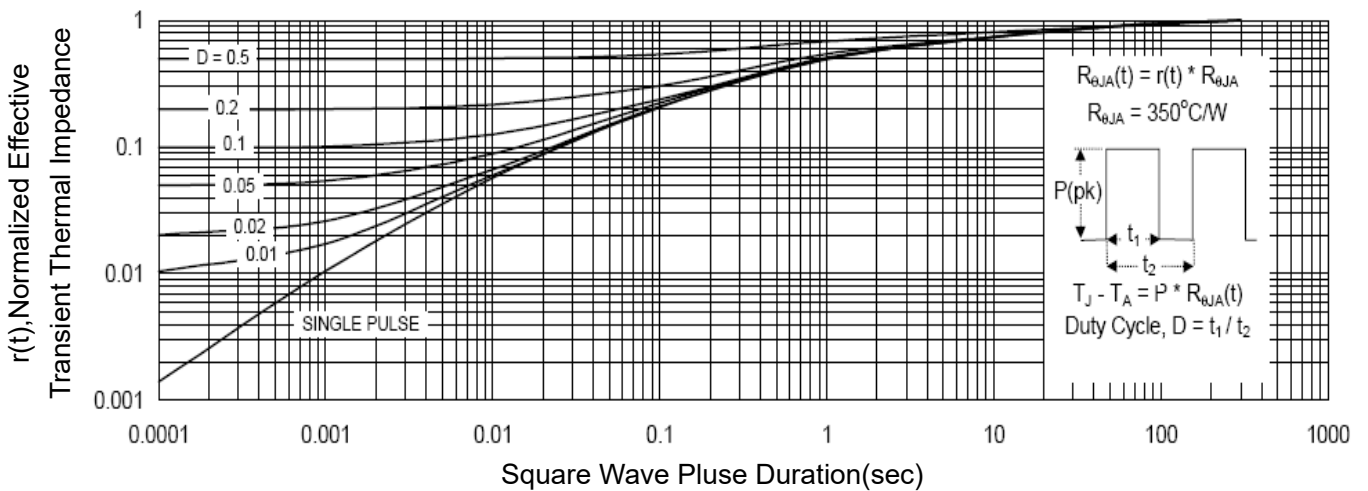
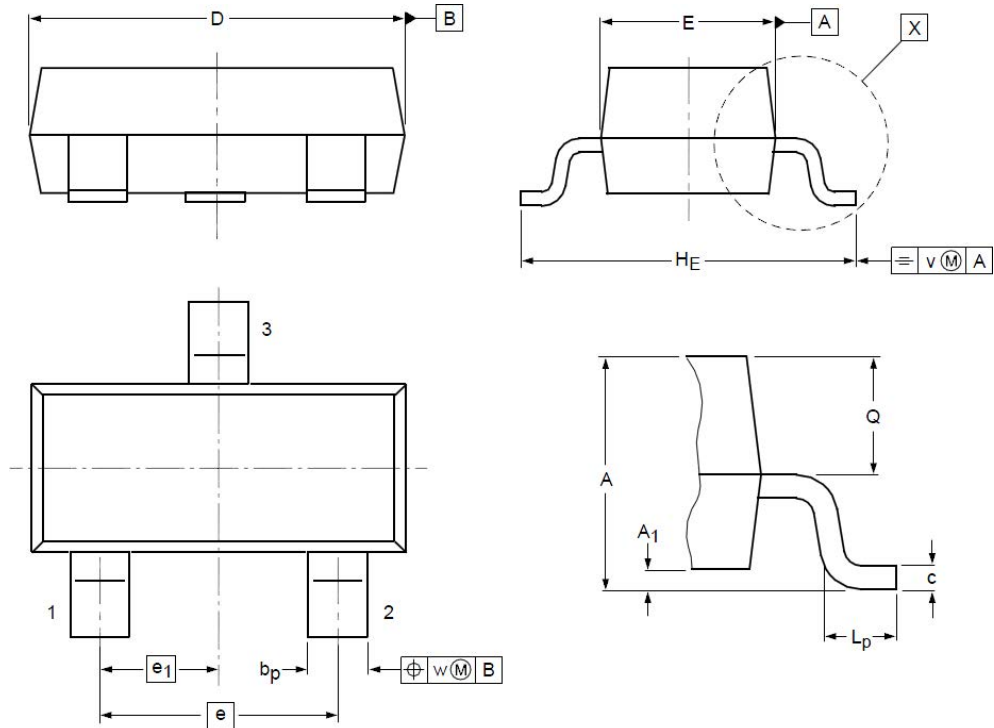


Figure 10 Normalized Maximum Transient Thermal Impedance

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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	--				