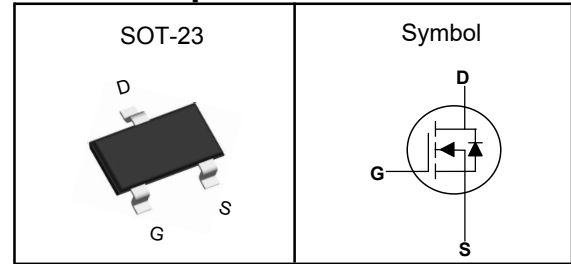


## N-Channel Enhancement Mode MOSFET

### Features

- Low  $R_{dson}$  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
$R_{DS(ON)-Typ}$	26	m $\Omega$
$I_D$	5	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	$\pm 12$	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	20	A
$I_D$	Continuous Drain Current	5	A
$P_D$	Maximum Power Dissipation	1.25	W

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C}/\text{W}$

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  $1\text{in}^2$  FR-4 board with 1oz.



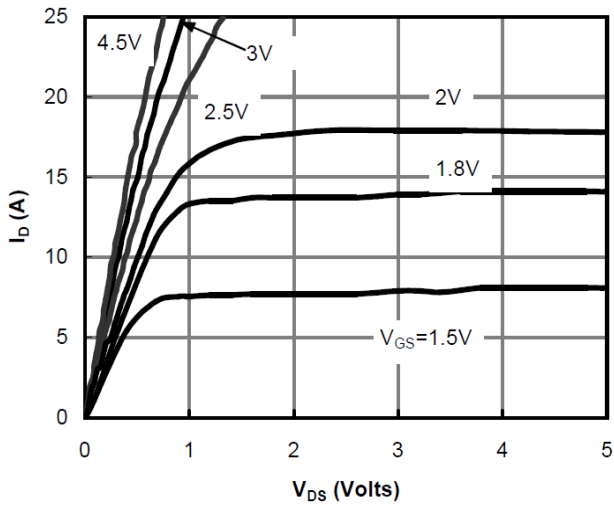
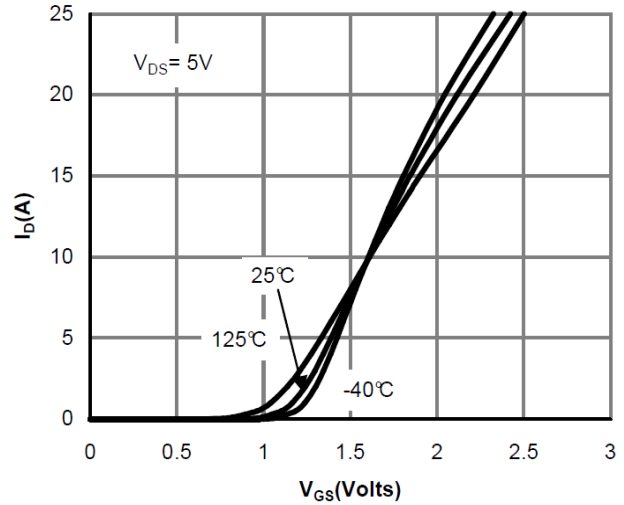
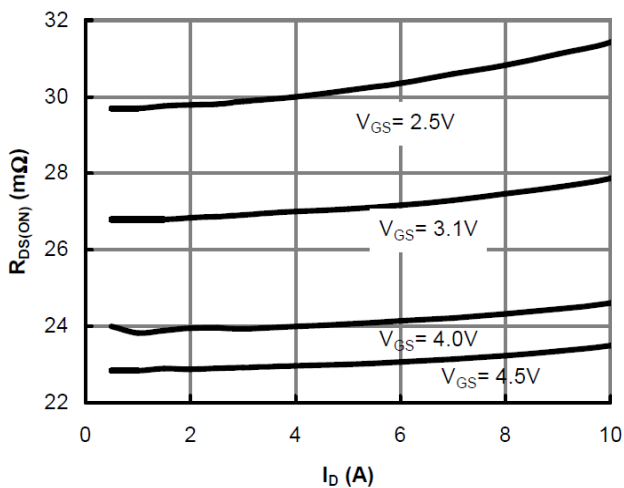
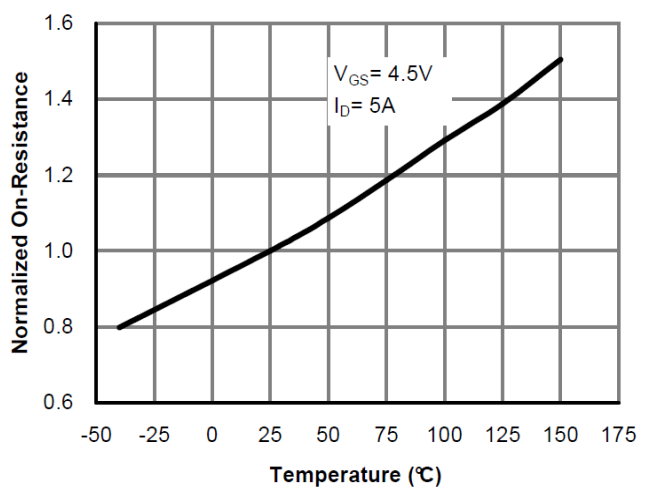
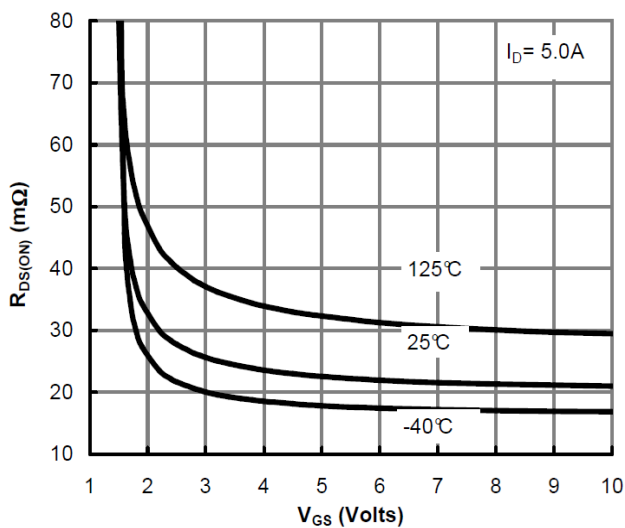
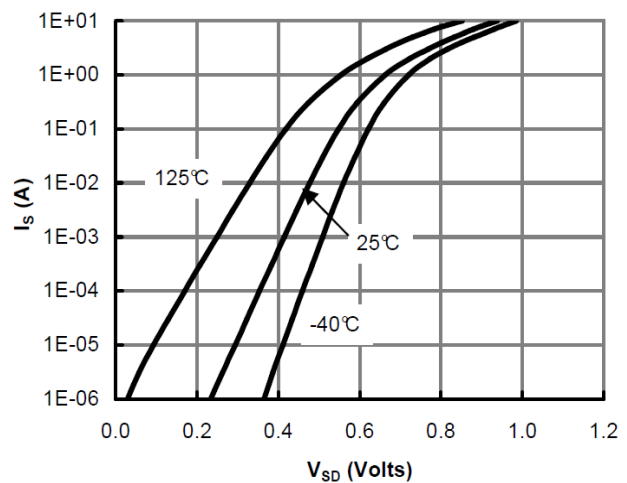
**N-Channel Enhancement Mode MOSFET**

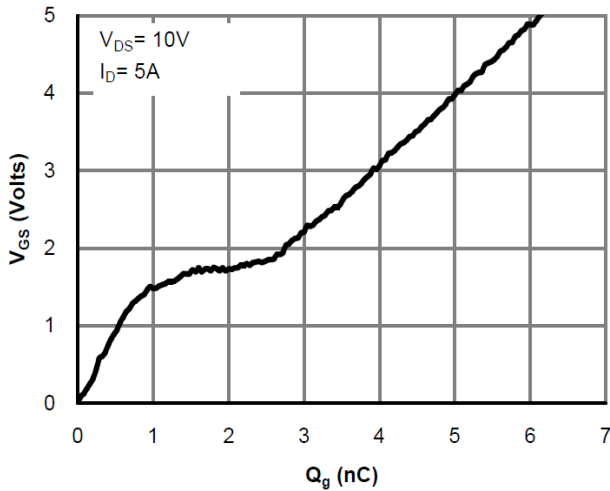
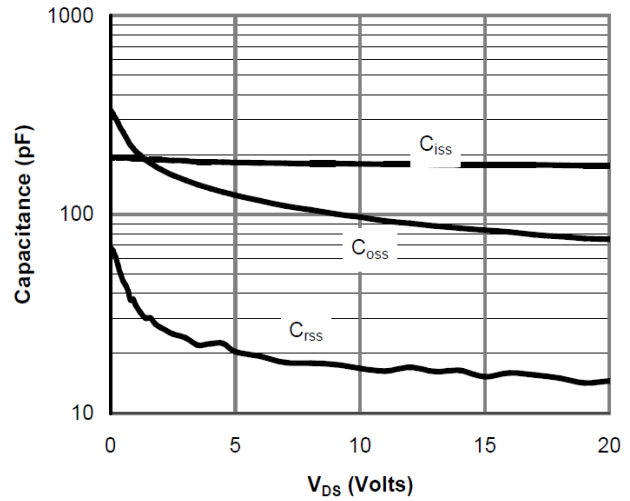
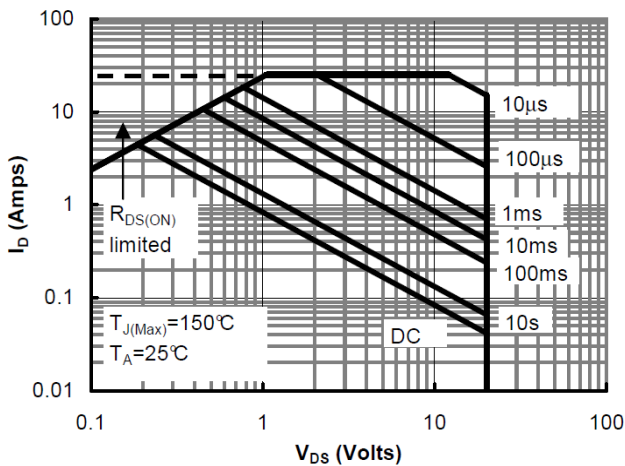
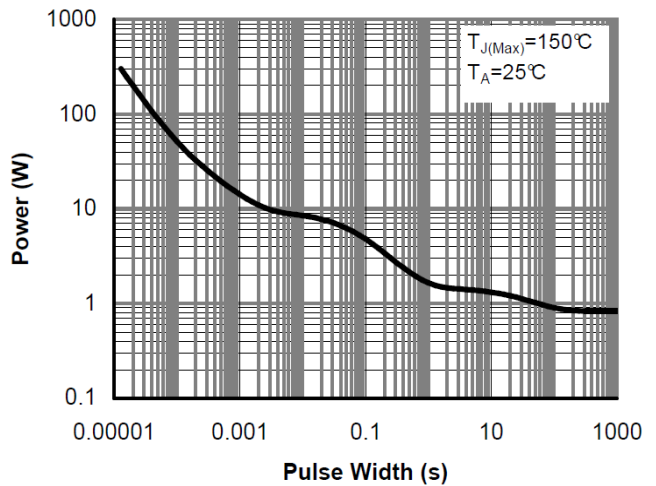
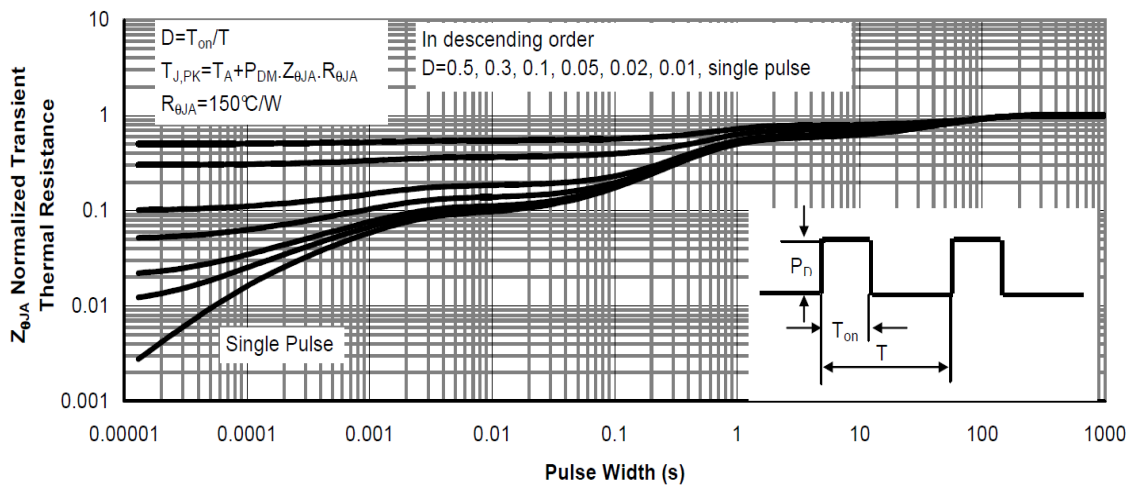
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

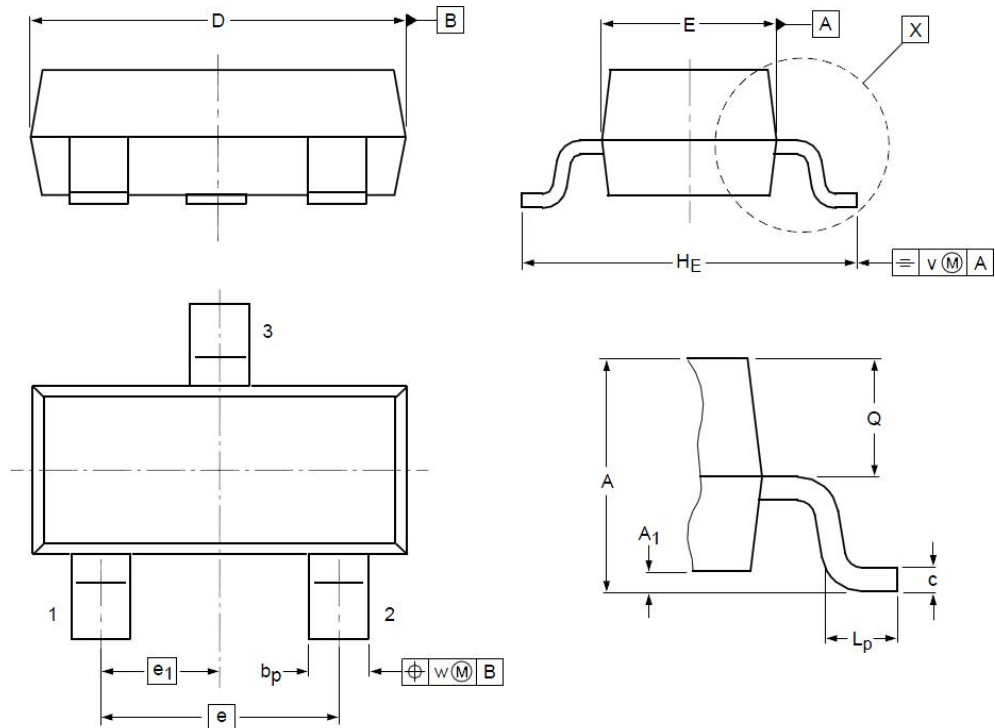
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	---	---	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.45	---	1	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_D=5A$	---	26	30	$m\Omega$
		$V_{GS}=2.5V, I_D=4A$	---	32	40	$m\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=10V, \text{Freq.}=1\text{MHz}$	---	240	---	pF
$C_{oss}$	Output Capacitance		---	45	---	
$C_{rss}$	Reverse Transfer Capacitance		---	23	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=10V, V_{GS}=4.5V, R_G=6\Omega, R_L=3.3\Omega$	---	2.3	---	nS
$T_r$	Turn-on Rise Time		---	3.1	---	
$T_{d(off)}$	Turn-off Delay Time		---	21	---	
$T_f$	Turn-off Fall Time		---	2.6	---	
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=5A$	---	5	---	S
$Q_g$	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=5A$	---	2.7	---	nC
$Q_{gs}$	Gate-Source Charge		---	0.4	---	
$Q_{gd}$	Gate-Drain Charge		---	0.5	---	
<b>Source-Drain Characteristics</b> ( $T_J=25^{\circ}\text{C}$ )						
$V_{SD}$ <sup>④</sup>	Diode Forward Voltage	$I_S=5A, V_{GS}=0V$	---	0.76	1.16	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**

**Figure 1: On-Region Characteristics**

**Figure 2: Transfer Characteristics**

**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**

**Figure 4: On-Resistance vs. Junction Temperature**

**Figure 5: On-Resistance vs. Gate-Source Voltage**

**Figure 6: Body-Diode Characteristics**

**N-Channel Enhancement Mode MOSFET**

**Figure 7: Gate-Charge Characteristics**

**Figure 8: Capacitance Characteristics**

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

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

**Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)**

**N-Channel Enhancement Mode MOSFET**
**SOT23 Package Outline Dimensions**


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	0.90	1.05	1.20	<b>e<sub>1</sub></b>	--	0.95	--
<b>A<sub>1</sub></b>	0.01	0.05	0.10	<b>H<sub>E</sub></b>	2.10	2.40	2.50
<b>b<sub>p</sub></b>	0.38	0.42	0.48	<b>L<sub>p</sub></b>	0.40	0.50	0.60
<b>c</b>	0.09	0.13	0.15	<b>Q</b>	0.45	0.49	0.55
<b>D</b>	2.80	2.92	3.00	<b>V</b>	--	0.20	--
<b>E</b>	1.20	1.33	1.40	<b>W</b>	--	0.10	--
<b>e</b>	--	1.90	--				