

P-Channel Enhancement Mode MOSFET

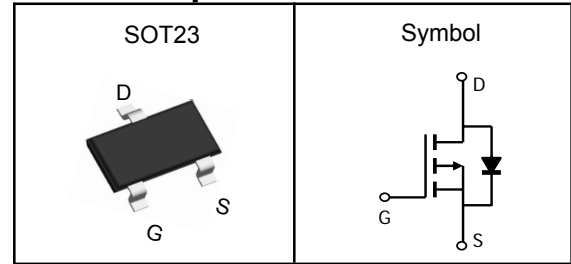
Features

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

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	-20	V
$R_{DS(ON)-Typ}$	31	m Ω
I_D	-4.5	A

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

Symbol	Parameter	P-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	-20	A
I_D	Continuous Drain Current	-4.5	A
P_D	Maximum Power Dissipation	1.7	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	73.5	$^\circ\text{C/W}$

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

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

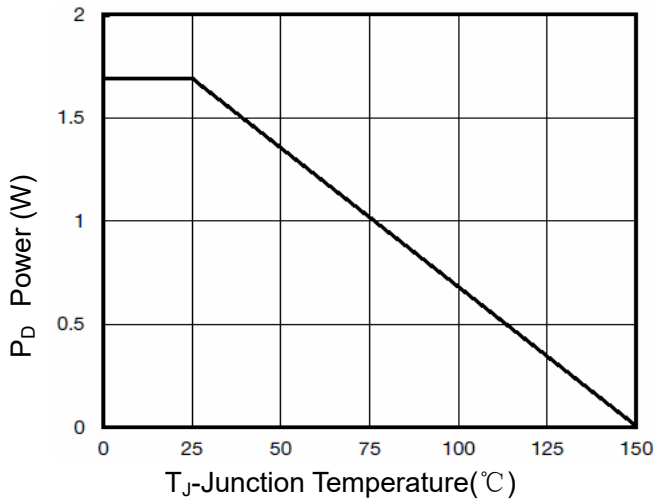
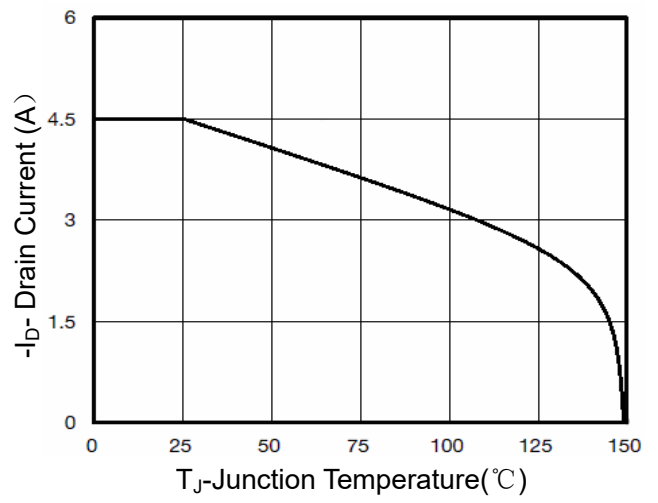
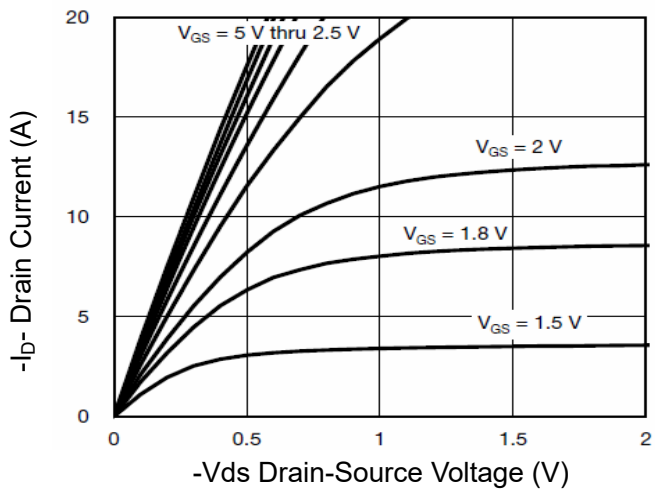
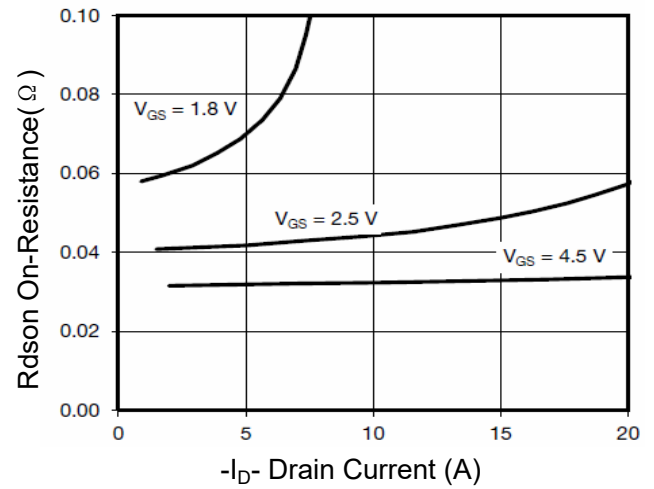
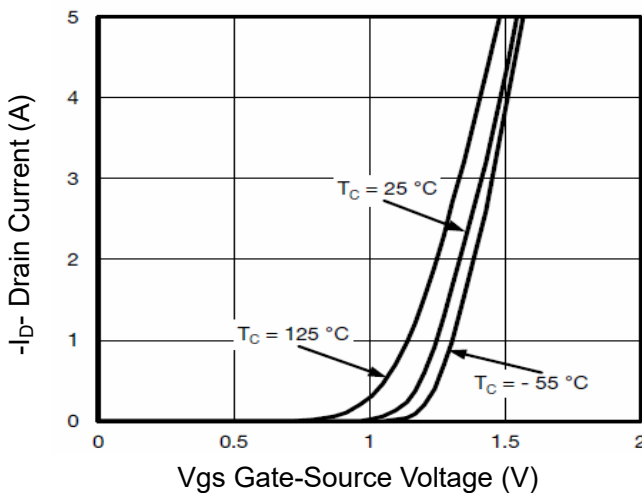
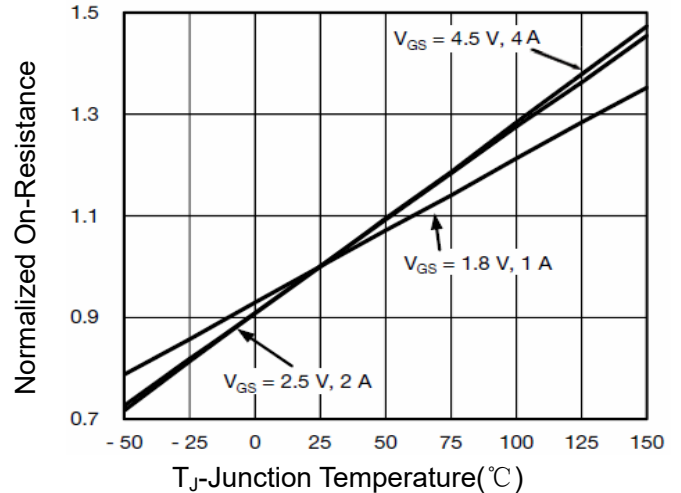
Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

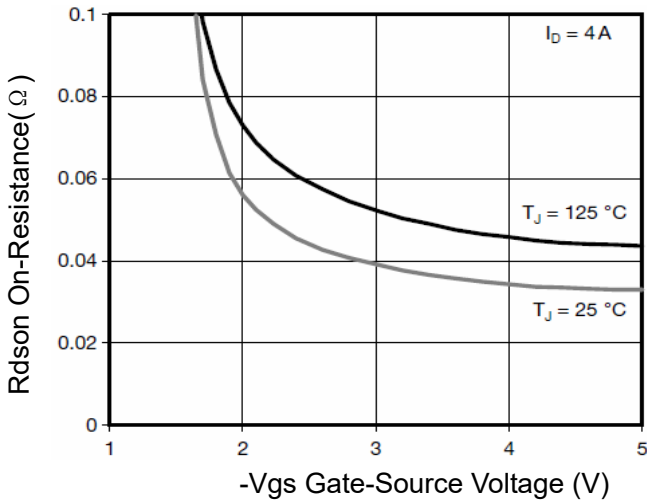
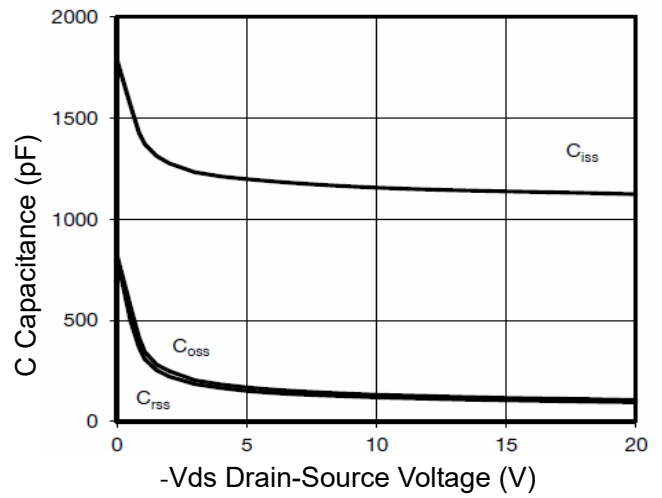
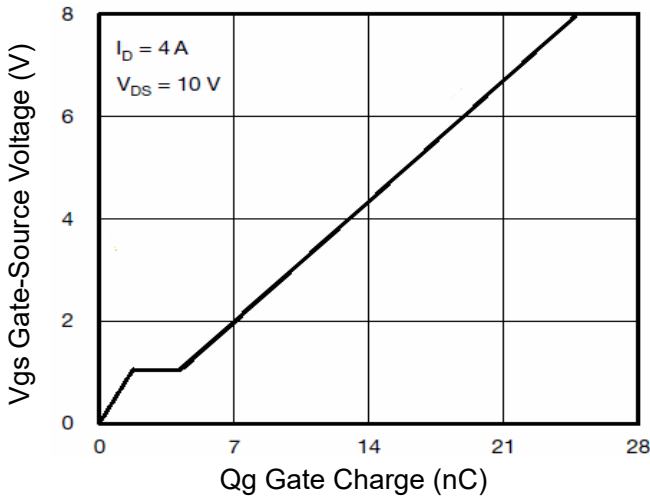
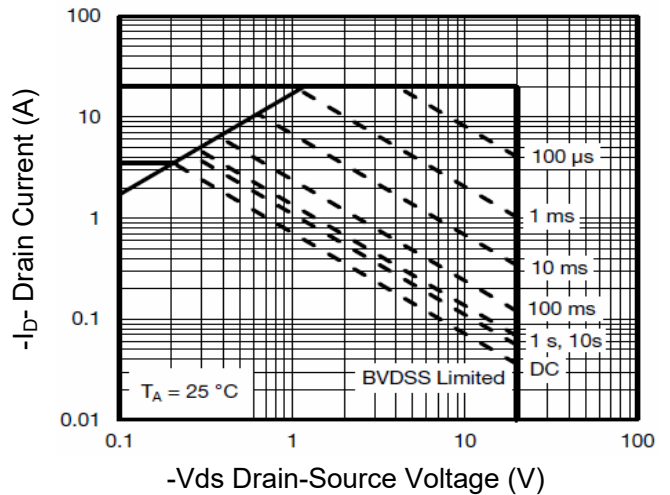
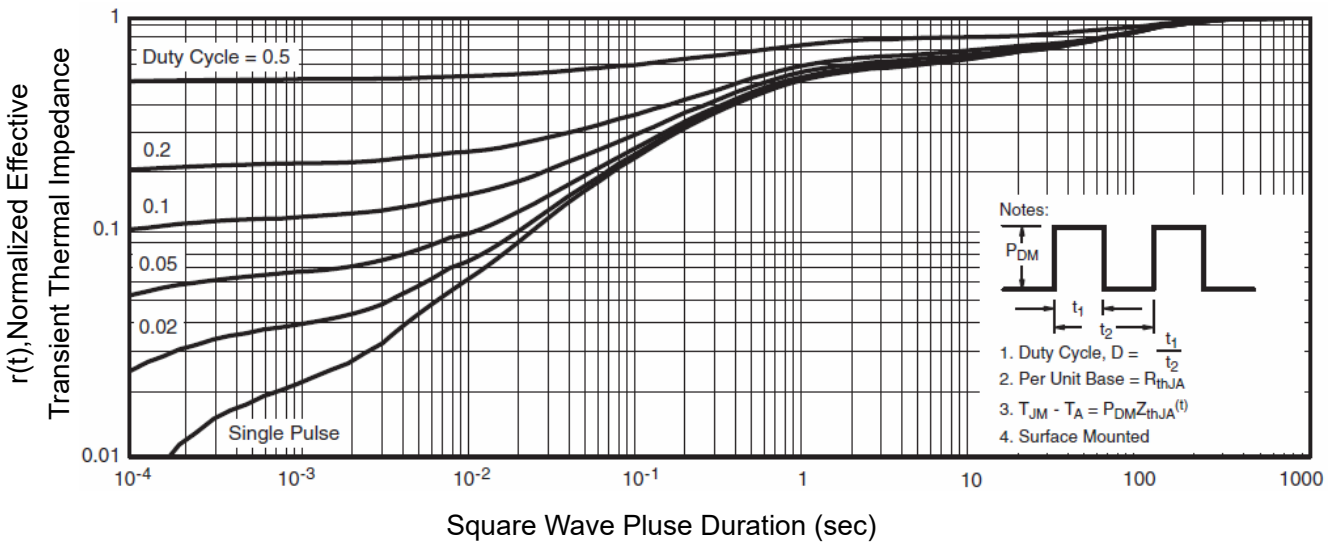
**P-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45	---	-1.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_D=-4A$	---	31	40	m Ω
		$V_{GS}=-2.5V, I_D=-2A$	---	47	70	
gfs	Forward Transconductance	$V_{DS}=-5V, I_D=-4.1A$	---	13	---	S
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-15V,$ Freq.=1MHz	---	1159	---	pF
C_{oss}	Output Capacitance		---	133	---	
C_{riss}	Reverse Transfer Capacitance		---	118	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=2.2\Omega,$ $V_{GS}=-4.5V, R_G=1\Omega,$ $I_D=-3.2A$	---	23	---	nS
T_r	Turn-on Rise Time		---	25	---	
$T_{d(off)}$	Turn-off Delay Time		---	55	---	
T_f	Turn-off Fall Time		---	13	---	
Q_g	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-4.5V,$ $I_D=-4A$	---	14.5	---	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	$I_S=-5.3A, V_{GS}=0V$	---	---	-1.2	V

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

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

P-Channel Enhancement Mode MOSFET
Typical Characteristics

Figure 1 Power Dissipation

Figure 2 Drain Current

Figure 3 Output Characteristics

Figure 4 Drain-Source On-Resistance

Figure 5 Transfer Characteristics

Figure 6 Drain-Source On-Resistance

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Figure 7 Rdson vs Vgs

Figure 8 Capacitance vs Vds

Figure 9 Gate Charge

Figure 10 Safe Operation Area

Figure 11 Normalized Maximum Transient Thermal Impedance

P-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	--				