

## P-Channel Enhancement Mode MOSFET

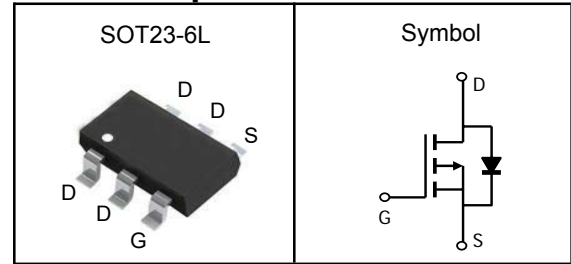
### Features

- 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
$R_{DS(ON)-Typ}$	35	$m\Omega$
$I_D$	-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	$\pm 12$	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	-4.5	A
$P_D$	Maximum Power Dissipation	1.6	W

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	78	$^\circ\text{C/W}$

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

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

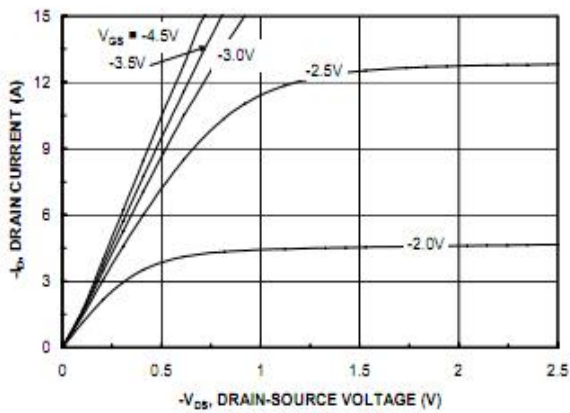
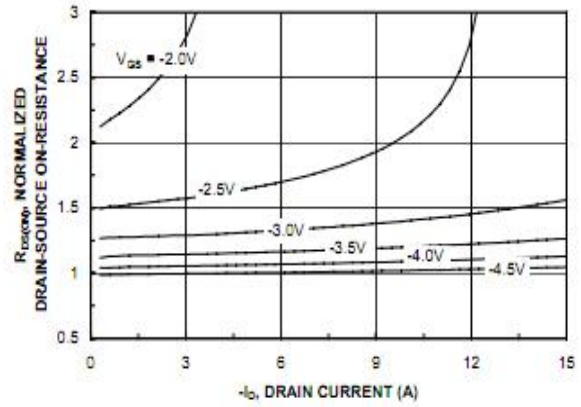
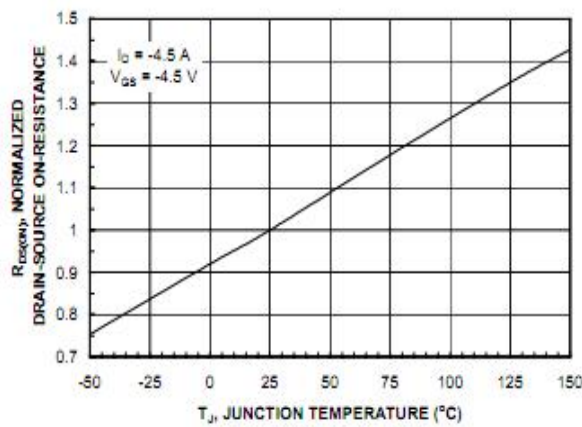
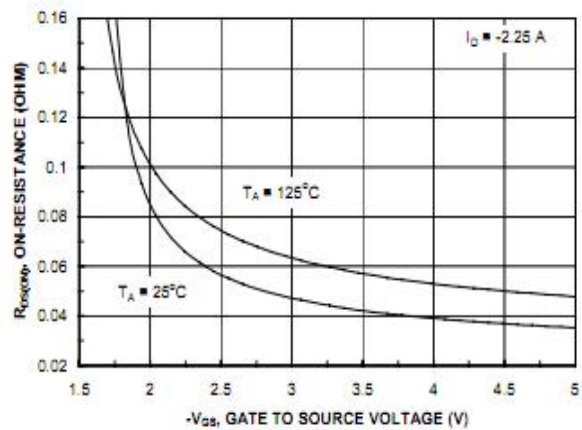
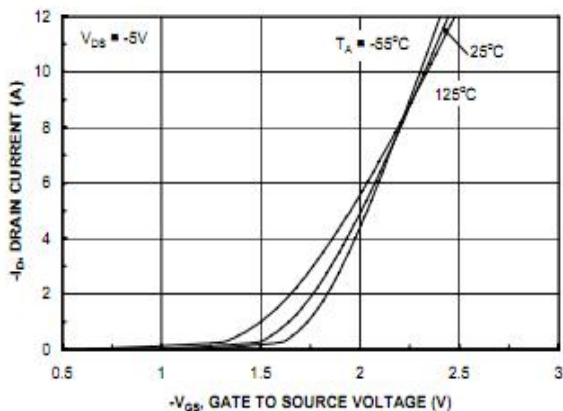
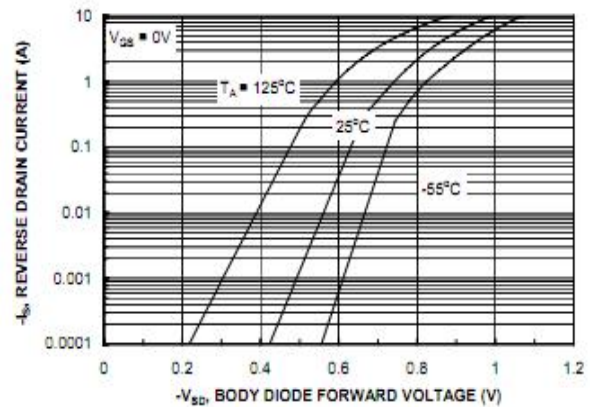
Note ③ : Surface Mounted on  $1\text{in}^2$  FR-4 board with 1oz.

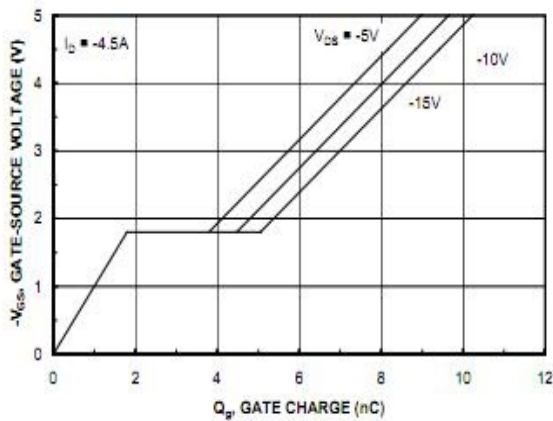
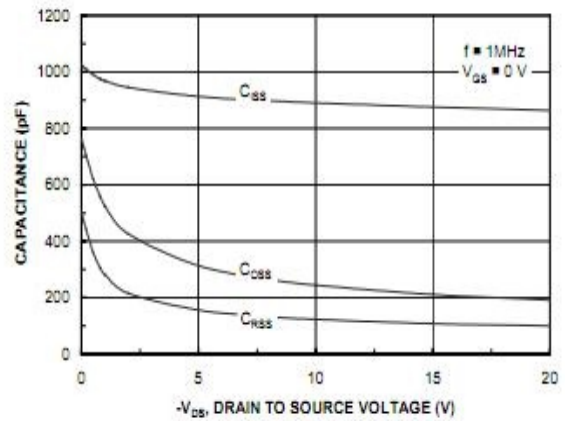
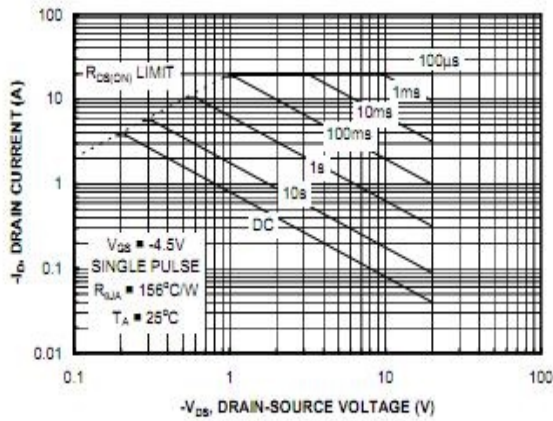
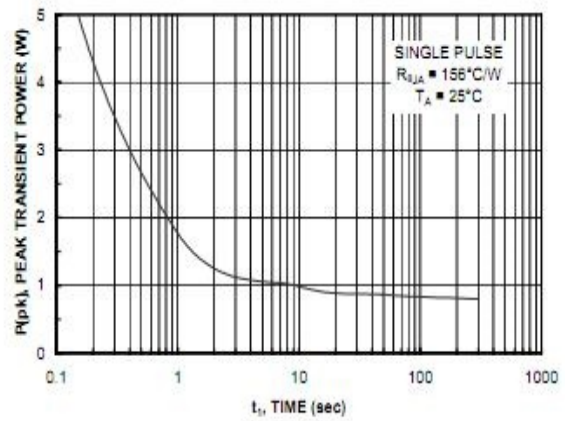
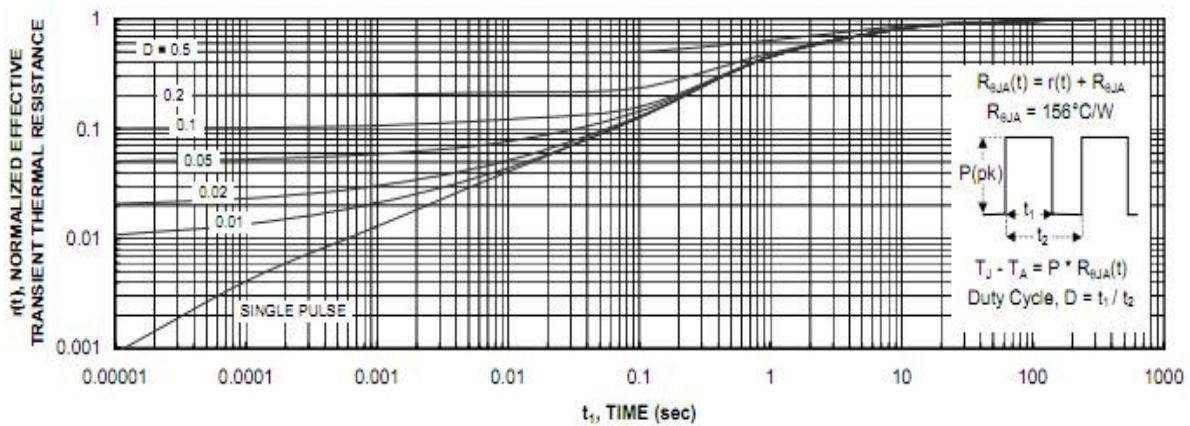
**P-Channel Enhancement Mode MOSFET****Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

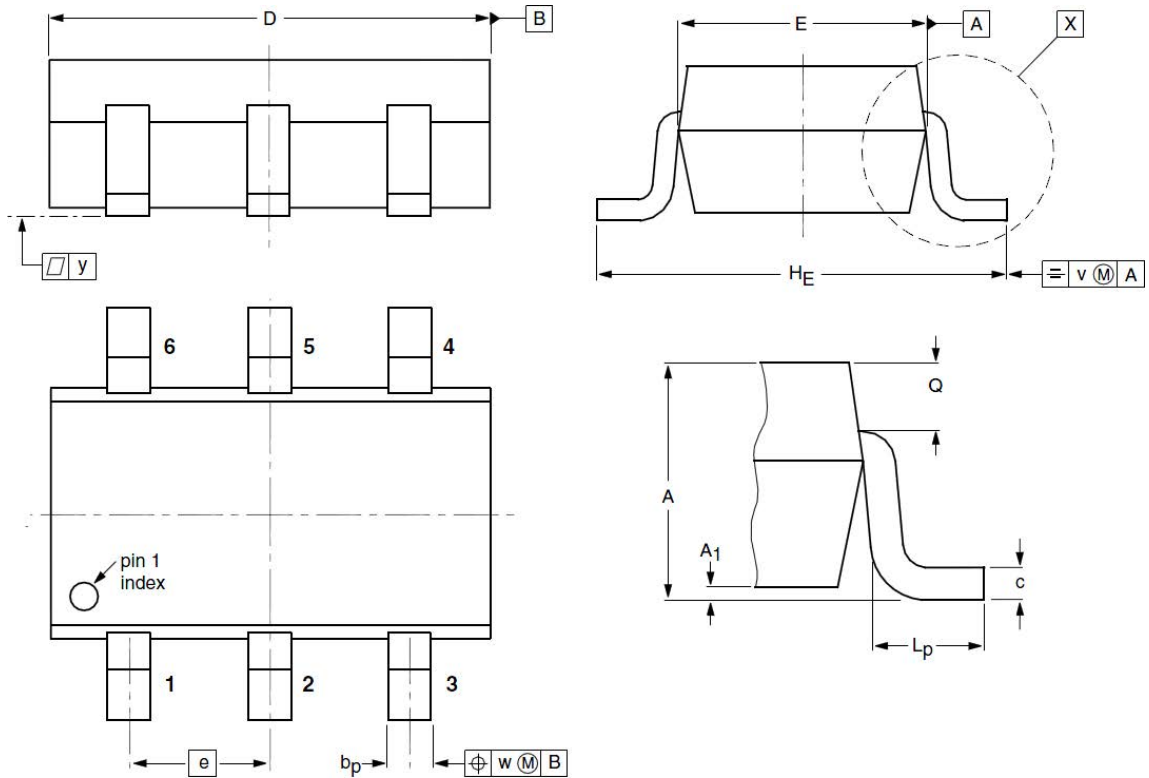
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$	---	---	-1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	---	-1.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_D=-4.5A$	---	35	55	m $\Omega$
		$V_{GS}=-2.5V, I_D=-3.6A$	---	42	80	
gfs	Forward Transconductance	$V_{DS}=-5V, I_D=-4.5A$	---	16	---	S
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Freq.=1MHz	---	890	---	pF
$C_{oss}$	Output Capacitance		---	244	---	
$C_{rss}$	Reverse Transfer Capacitance		---	123	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=-10V, V_{GS}=-4.5V,$ $R_G=6\Omega, I_D=-1A$	---	12	---	nS
$T_r$	Turn-on Rise Time		---	9	---	
$T_{d(off)}$	Turn-off Delay Time		---	24	---	
$T_f$	Turn-off Fall Time		---	13	---	
$Q_g$	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-4.5V,$ $I_D=-4.5A$	---	9	---	nC
$Q_{gs}$	Gate-Source Charge		---	2	---	
$Q_{gd}$	Gate-Drain Charge		---	3	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$ <sup>④</sup>	Diode Forward Voltage	$I_S=-1A, V_{GS}=0V$	---	-0.8	-1.3	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. On-Region Characteristics.**

**Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.**

**Figure 3. On-Resistance Variation with Temperature.**

**Figure 4. On-Resistance Variation with Gate-to-Source Voltage.**

**Figure 5. Transfer Characteristics.**

**Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.**

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**Figure 7. Gate Charge Characteristics.**

**Figure 8. Capacitance Characteristics.**

**Figure 9. Maximum Safe Operating Area.**

**Figure 10. Single Pulse Maximum Power Dissipation.**

**Figure 11. Transient Thermal Response Curve.**

**P-Channel Enhancement Mode MOSFET**
**SOT23-6L Package Outline Dimensions**


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	0.90	1.07	1.45	<b>A<sub>1</sub></b>	0.01	0.05	0.15
<b>b<sub>p</sub></b>	0.30	0.40	0.50	<b>c</b>	0.10	0.15	0.22
<b>D</b>	2.70	2.92	3.10	<b>E</b>	1.35	1.55	1.75
<b>e</b>	--	0.95	--	<b>H<sub>E</sub></b>	2.50	2.80	3.00
<b>L<sub>p</sub></b>	0.30	0.45	0.60	<b>Q</b>	0.23	0.29	0.33
<b>v</b>	--	0.20	--	<b>W</b>	--	0.20	--
<b>y</b>	--	0.10	--				