



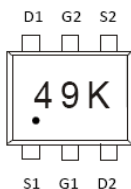
## SIX3439K

### N-Channel P-Channel MOSFET

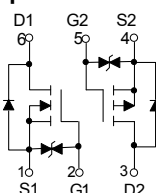
### Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Low  $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- Surface Mount Package
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

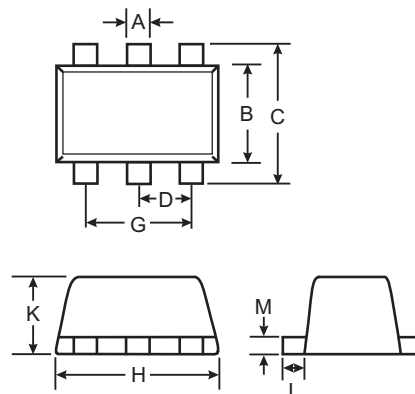
Marking:



#### Equivalent Circuit



### SOT-563



#### Maximum Ratings @ 250C Unless Otherwise Specified

Symbol	Rating	Rating	Unit
<b>N-MOSFET</b>			
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Continuous Drain Current	0.75	A
$I_{DM}$	Pulsed Drain Current( $t_p=10\mu s$ )	1.8	A
<b>P-MOSFET</b>			
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Continuous Drain Current	-0.66	A
$I_{DM}$	Pulsed Drain Current( $t_p=10\mu s$ )	-1.2	A
<b>Temperature and Thermal Resistance</b>			
$R_{thJA}$	Thermal Resistance from Junction to Ambient(note1)	833	$^{\circ}C/W$
$T_J$	Junction Temperature	150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55~150	$^{\circ}C$
$T_L$	Lead Temperature for Soldering Purposes (1/8" from case for 10s)	260	$^{\circ}C$

#### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.006	.011	0.15	0.30	
B	.043	.049	1.10	1.25	
C	.061	.067	1.55	1.70	
D	.020		0.50		
G	.035	.043	0.90	1.10	
H	.059	.067	1.50	1.70	
K	.022	.023	0.56	0.60	
L	.004	.011	0.10	0.30	
M	.004	.007	0.10	0.18	

N-ch MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> = 0V			±20	μA
Gate threshold voltage (note 2)	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.35		1	V
Drain-source on-resistance(note 2)	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.65A			380	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.55A			450	mΩ
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.45A			800	mΩ
Forward tranconductance(note 2)	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.8A		1.6		S
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> =0.15A, V <sub>GS</sub> = 0V			1.2	V
DYNAMIC CHARACTERISTICS (note 4)						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, f =1MHz		79	120	pF
Output Capacitance	C <sub>oss</sub>			13	20	pF
Reverse Transfer Capacitance	C <sub>rss</sub>			9	15	pF
SWITCHING CHARACTERISTICS (note 3,4)						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =500mA, R <sub>GEN</sub> =10Ω		6.7		ns
Turn-on rise time	t <sub>r</sub>			4.8		ns
Turn-off delay time	t <sub>d(off)</sub>			17.3		ns
Turn-off fall time	t <sub>f</sub>			7.4		ns

P-ch MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =-250μA	-20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> = 0V			±20	μA
Gate threshold voltage (note 2)	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.35		-1.1	V
Drain-source on-resistance(note 2)	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A			520	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.8A			700	mΩ
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.5A		950		mΩ
Forward tranconductance(note 2)	g <sub>FS</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-0.54A		1.2		S
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> =-0.5A, V <sub>GS</sub> = 0V			-1.2	V
DYNAMIC CHARACTERISTICS (note 4)						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V, f =1MHz		113	170	pF
Output Capacitance	C <sub>oss</sub>			15	25	pF
Reverse Transfer Capacitance	C <sub>rss</sub>			9	15	pF
SWITCHING CHARACTERISTICS (note 3,4)						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-200mA, R <sub>GEN</sub> =10Ω		9		ns
Turn-on rise time	t <sub>r</sub>			5.8		ns
Turn-off delay time	t <sub>d(off)</sub>			32.7		ns
Turn-off fall time	t <sub>f</sub>			20.3		ns

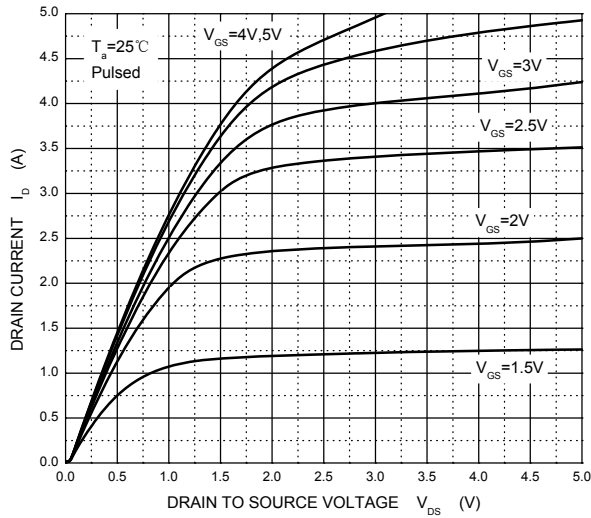
**Notes :**

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300 $\mu$ s, duty cycle $\leq$ 2%.
3. Switching characteristics are independent of operating junction temperature.
4. Guaranteed by design, not subject to producing.

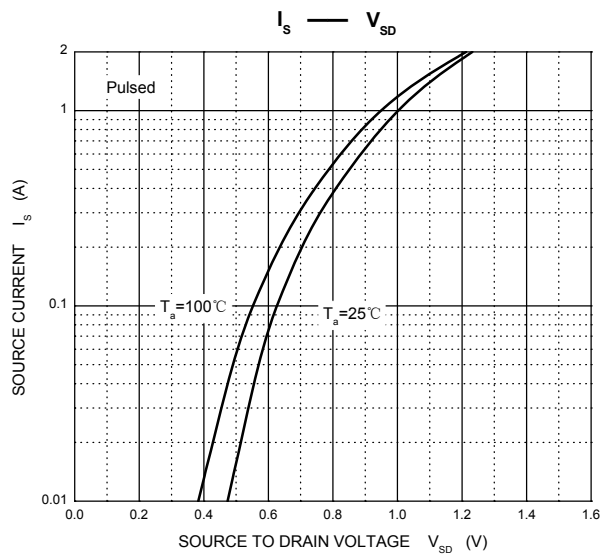
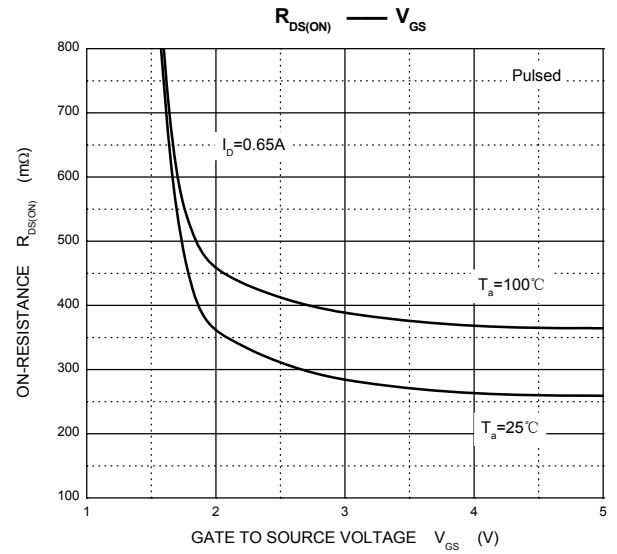
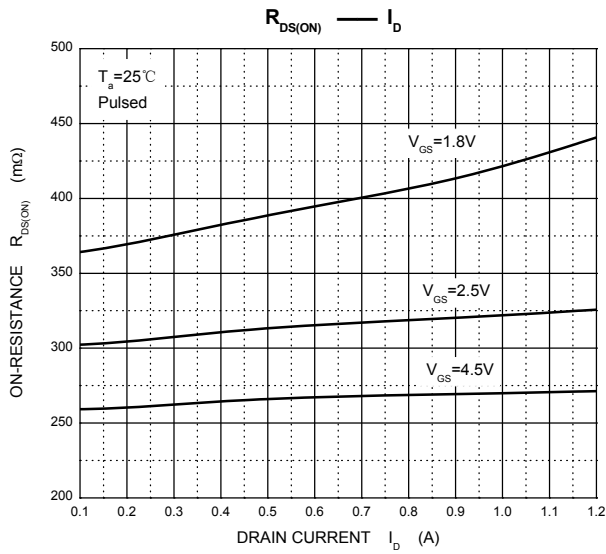
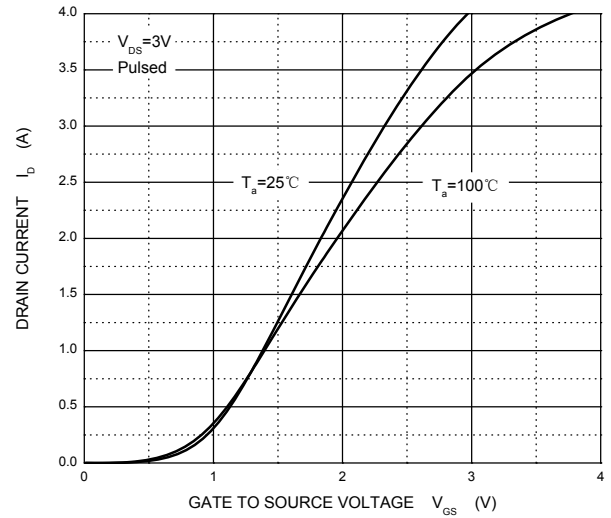
## Typical Characteristics

N-Channel MOS

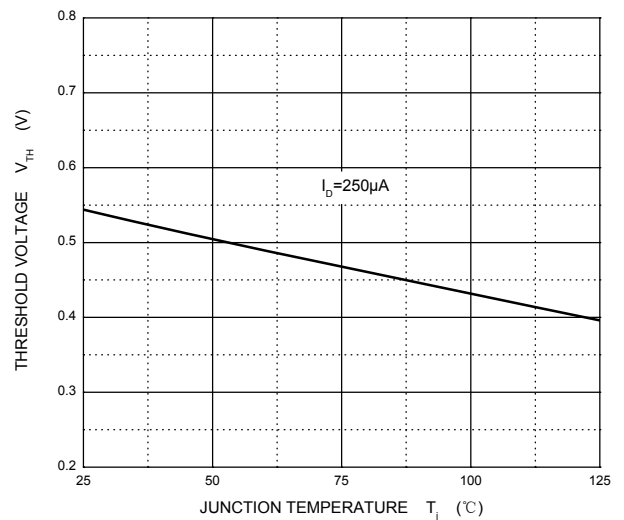
Output Characteristics



Transfer Characteristics



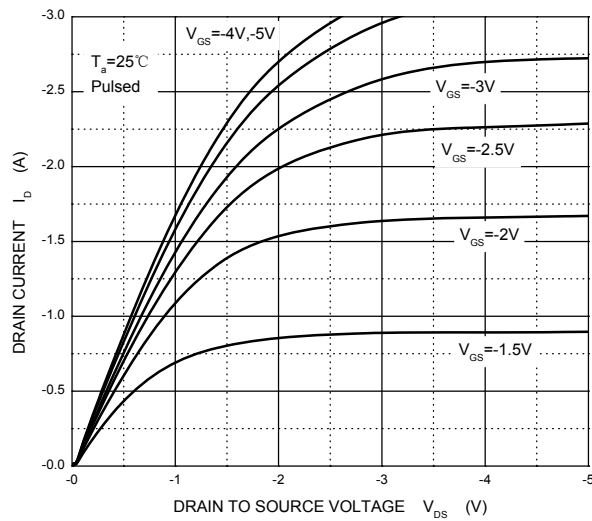
Threshold Voltage



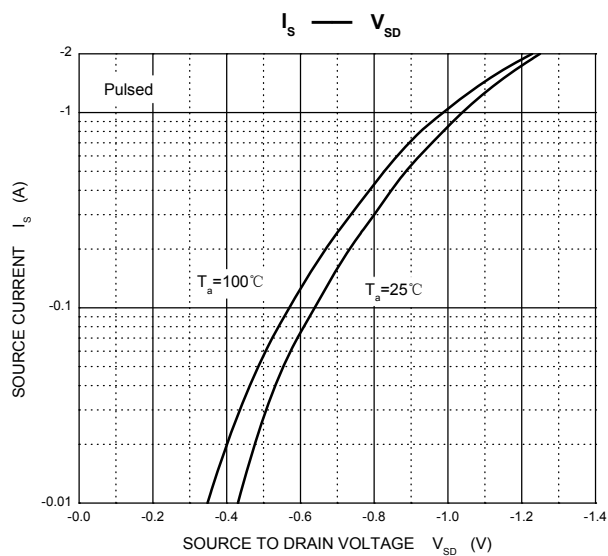
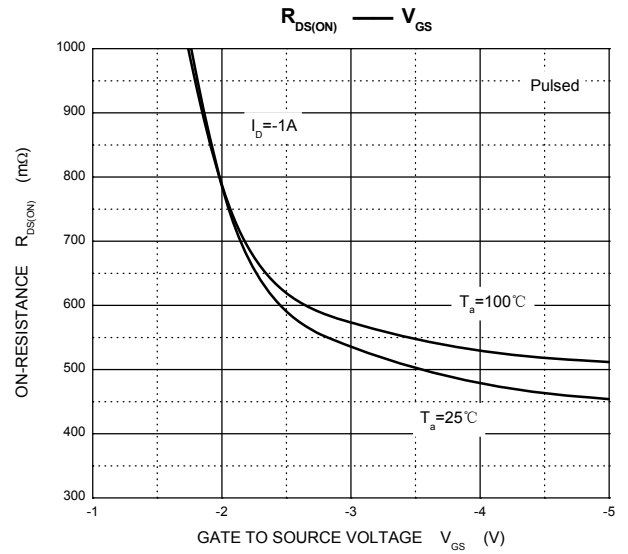
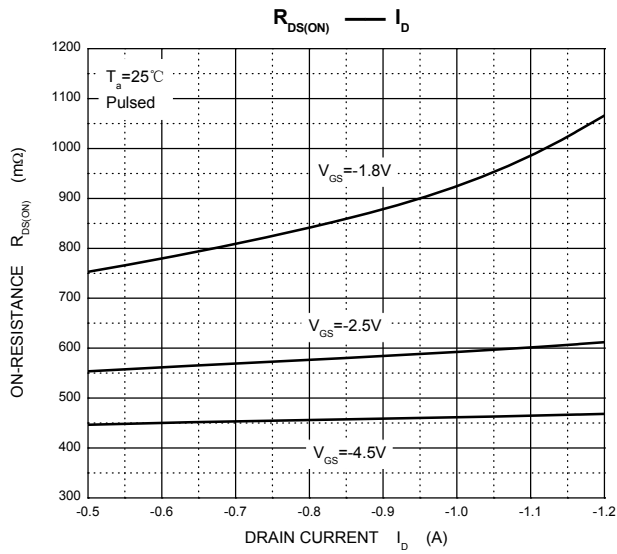
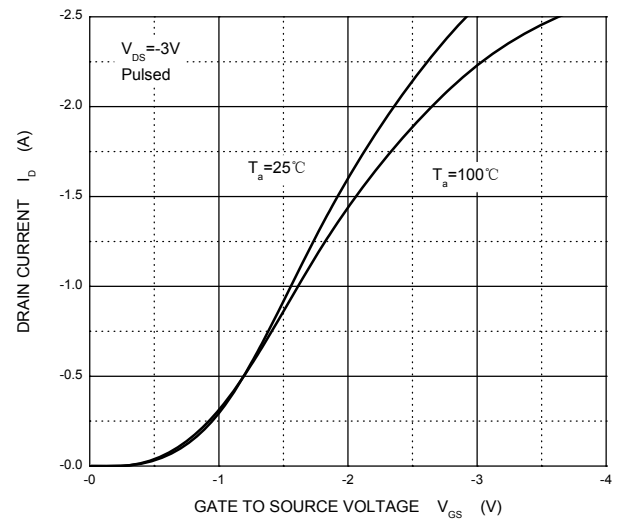
## Typical Characteristics

P-Channel MOS

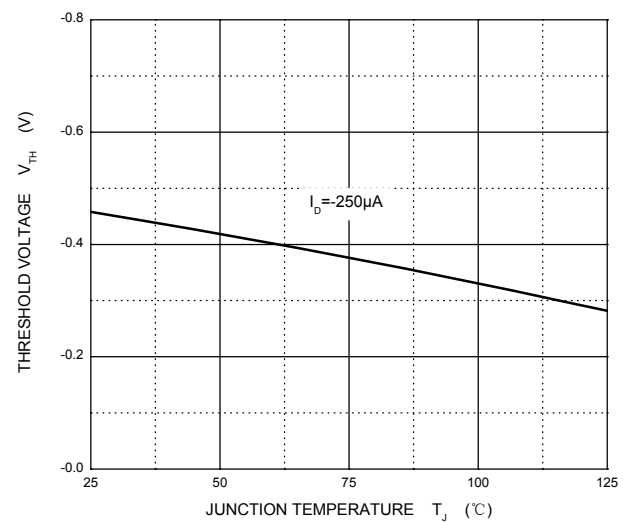
Output Characteristics



Transfer Characteristics



Threshold Voltage



## Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel; 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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