

### General Description

The KST3104 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible onresistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

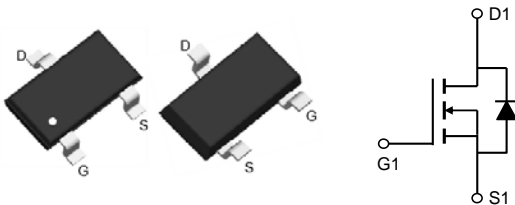
### Product Summary

$V_{DS}$ (V)	$R_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
100	128 at $V_{GS} = 10$ V	5
	133 at $V_{GS} = 4.5$ V	3.8

### Features

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

### SOT-23-3L Pin Configuration



### Applications

- PWM applications
- Load switch Power
- management

### Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ )	5	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ )	2.1	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	15	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	0.8	W
	Power Dissipation ( $T_c=100^\circ\text{C}$ )	0.01	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	98	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	27	$^\circ\text{C}/\text{W}$

### Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted) Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=100V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=3A$	---	128	160	$m\Omega$
		$V_{GS}=4.5V, I_D=2A$	---	133	170	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.8	3.0	V
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_S=3A$	---	10	---	S

### Dynamic and switching Characteristics

$Q_g$	Total Gate Charge	$V_{DS}=50V, V_{GS}=5V, I_D=3A$	---	22	---	nC
$Q_{gs}$	Gate-Source Charge		---	2.8	---	
$Q_{gd}$	Gate-Drain Charge		---	3.6	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=50V, R_L=19\Omega$ $V_{GS}=10V, R_G=3\Omega$	---	6.8	---	ns
$T_r$	Rise Time		---	5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	23	---	
$T_f$	Fall Time		---	5	---	
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	---	665	---	pF
$C_{oss}$	Output Capacitance		---	28	---	
$C_{rss}$	Reverse Transfer Capacitance		---	22	---	

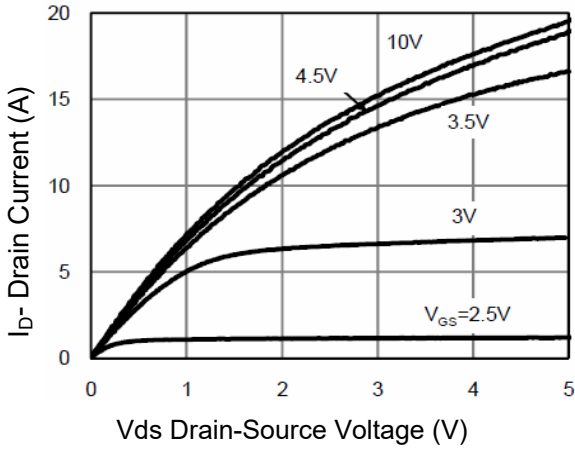
### Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	5	A
$I_{SM}$	Pulsed Source Current		---	---	10	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V

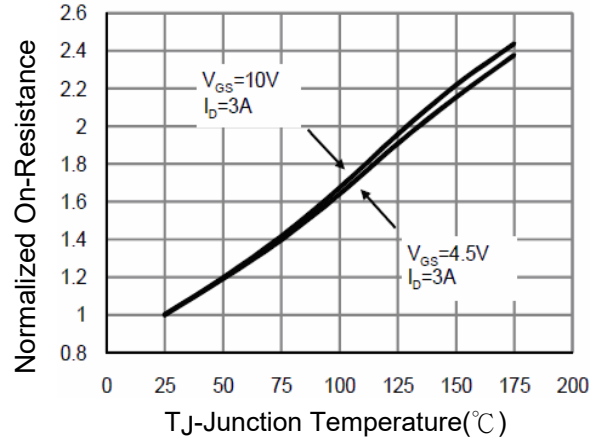
Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

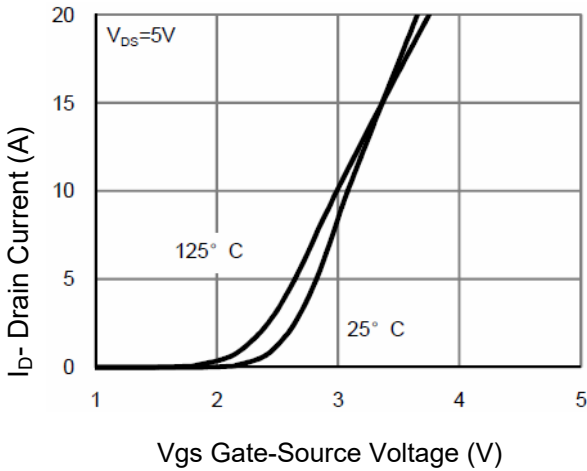
**Typical Electrical and Thermal Characteristics (Curves)**



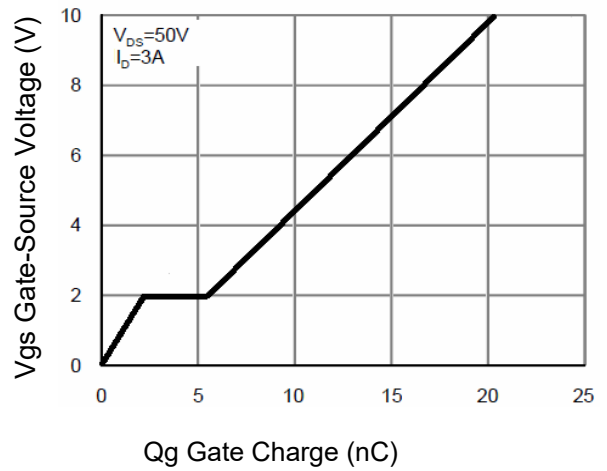
**Fig. 1 Output Characteristics**



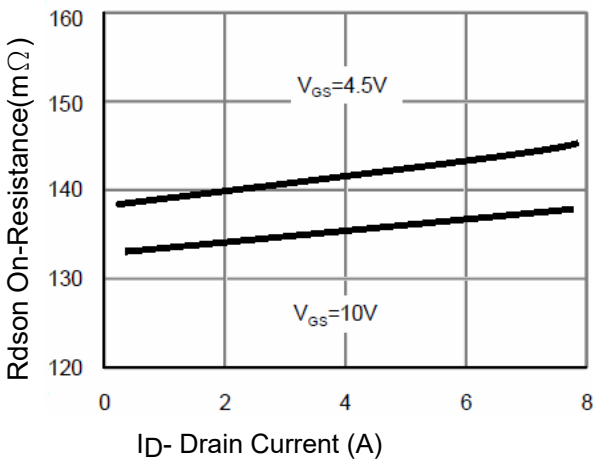
**Fig. 4 Drain-Source On-Resistance**



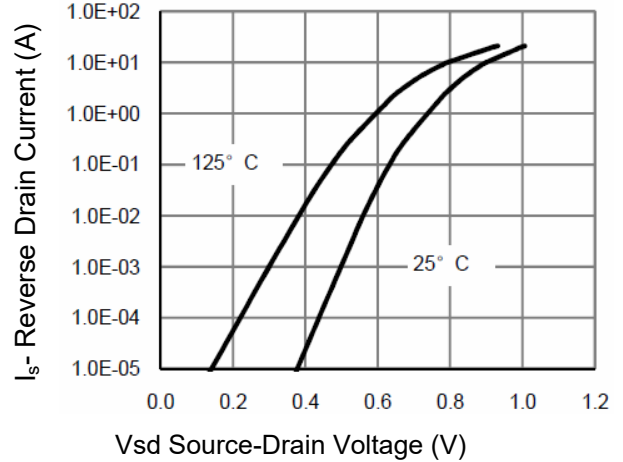
**Fig. 2 Transfer Characteristics**



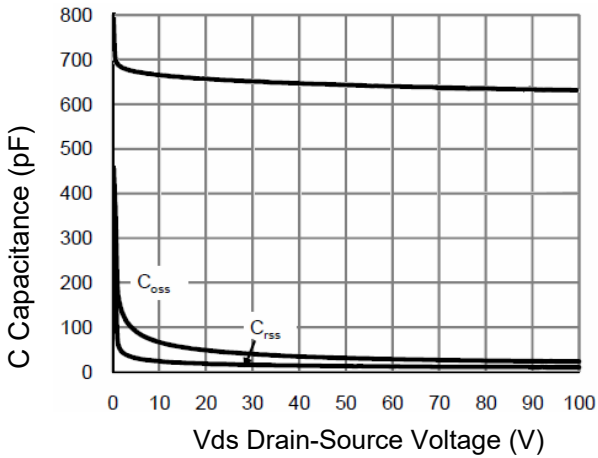
**Fig. 5 Gate Charge**



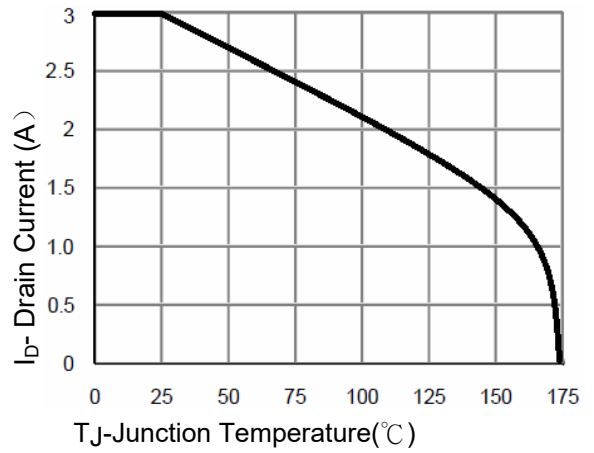
**Fig. 3  $R_{DS(on)}$ - Drain Current**



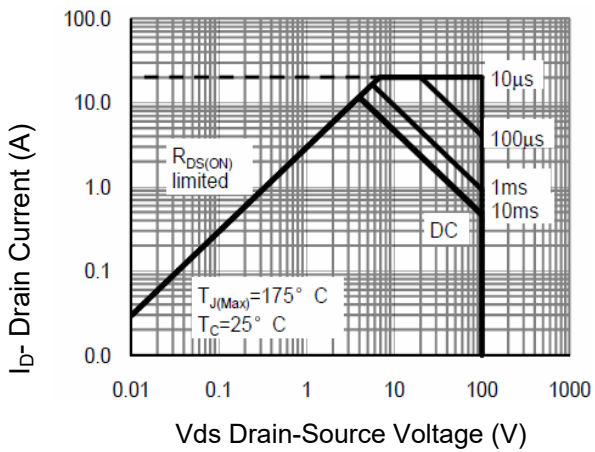
**Fig. 6 Source- Drain Diode Forward**



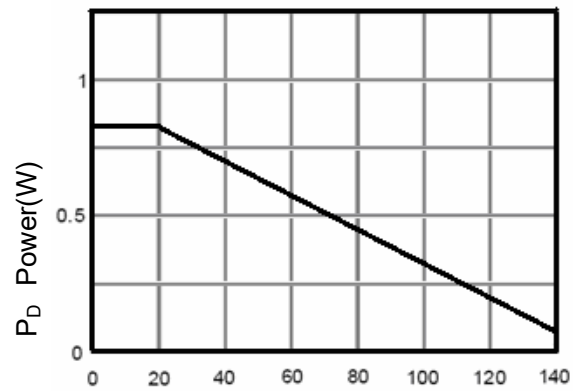
**Fig.7 Capacitance vs Vds**



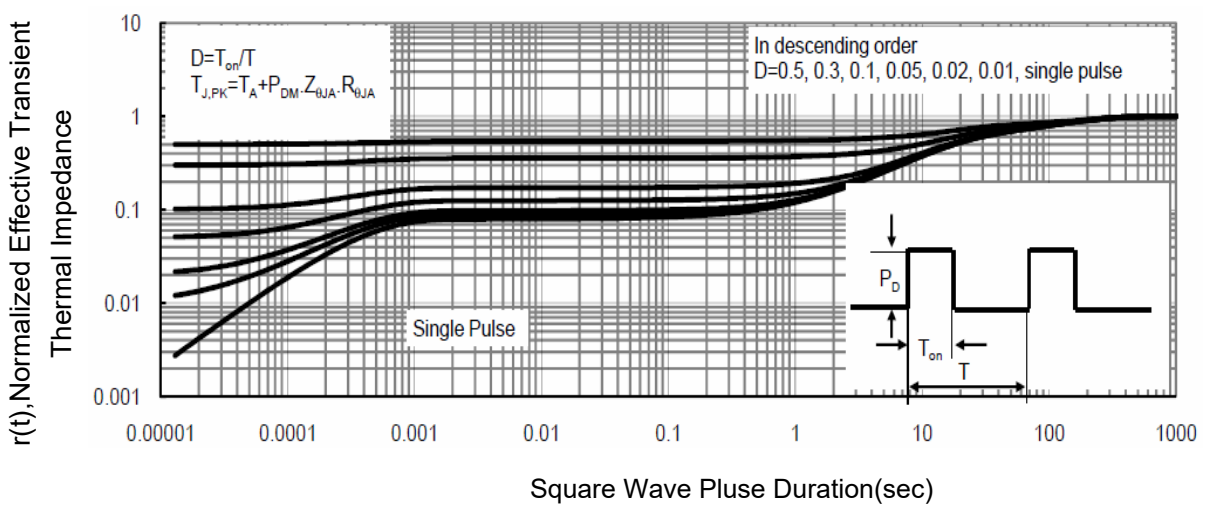
**Fig. 8 Drain Current**



**Fig.9 Safe Operation Area**



**Fig. 10 Power Dissipation**



**Fig.11 Normalized Maximum Transient Thermal Impedance**

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