

## N-Channel Enhancement Mode Power MOSFET

### Description

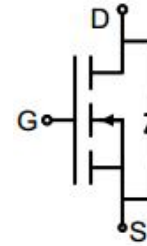
The G1K3N10G uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge. It can be used in a wide variety of applications.

### General Features

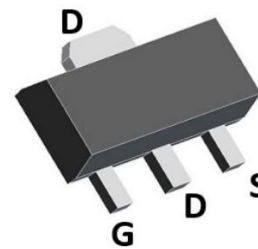
- $V_{DS}$  100V
- $I_D$  (at  $V_{GS} = 10V$ ) 5A
- $R_{DS(ON)}$  (at  $V_{GS} = 10V$ ) < 130m $\Omega$
- $R_{DS(ON)}$  (at  $V_{GS} = 4.5V$ ) < 150m $\Omega$
- 100% Avalanche Tested
- RoHS Compliant

### Application

- Power switch
- DC/DC converters



Schematic diagram



SOT-89

### Ordering Information

Device	Package	Marking	Packaging
G1K3N10G	SOT-89	G1K3N10	1000pcs/Carton

### Absolute Maximum Ratings $T_C = 25^\circ C$ , unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Continuous Drain Current	$I_D$	5	A
Pulsed Drain Current (note1)	$I_{DM}$	20	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_D$	1.5	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	$^\circ C$

### Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	83	$^\circ C/W$

Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$	--	--	1	$\mu A$
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 20V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.6	2	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5A$	--	110	130	m $\Omega$
		$V_{GS} = 4.5V, I_D = 5A$	--	120	150	
Forward Transconductance	$g_{FS}$	$V_{GS} = 5V, I_D = 5A$	--	7	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 50V,$ $f = 1.0MHz$	--	644	--	pF
Output Capacitance	$C_{oss}$		--	25	--	
Reverse Transfer Capacitance	$C_{rss}$		--	14	--	
Total Gate Charge	$Q_g$	$V_{DD} = 50V,$ $I_D = 5A,$ $V_{GS} = 10V$	--	20	--	nC
Gate-Source Charge	$Q_{gs}$		--	2.1	--	
Gate-Drain Charge	$Q_{gd}$		--	3.3	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50V,$ $I_D = 5A,$ $R_G = 3\Omega$	--	6	--	ns
Turn-on Rise Time	$t_r$		--	4	--	
Turn-off Delay Time	$t_{d(off)}$		--	20	--	
Turn-off Fall Time	$t_f$		--	4	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	5	A
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 5A, V_{GS} = 0V$	--	--	1.2	V
Reverse Recovery Charge	$Q_{rr}$	$I_F = 5A, V_{GS} = 0V$ $di/dt=100A/us$	--	11	--	nC
Reverse Recovery Time	$T_{rr}$		--	22	--	ns

### Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$

### Gate Charge Test Circuit



### Switch Time Test Circuit

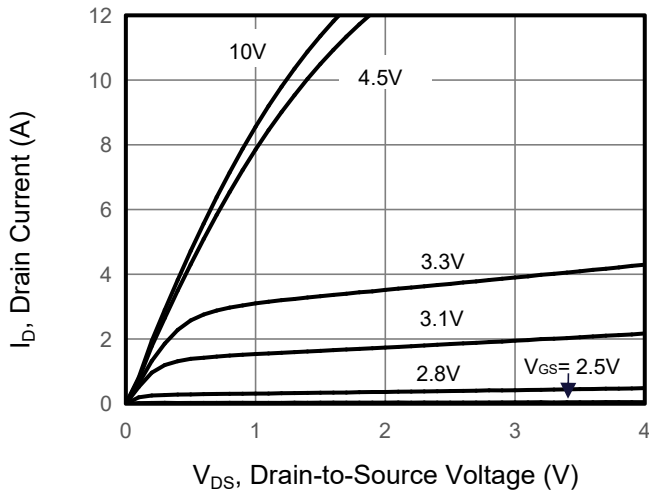


### EAS Test Circuit

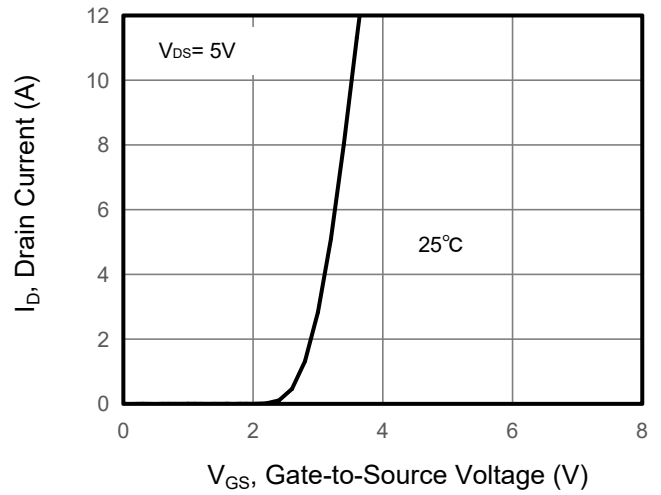


Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

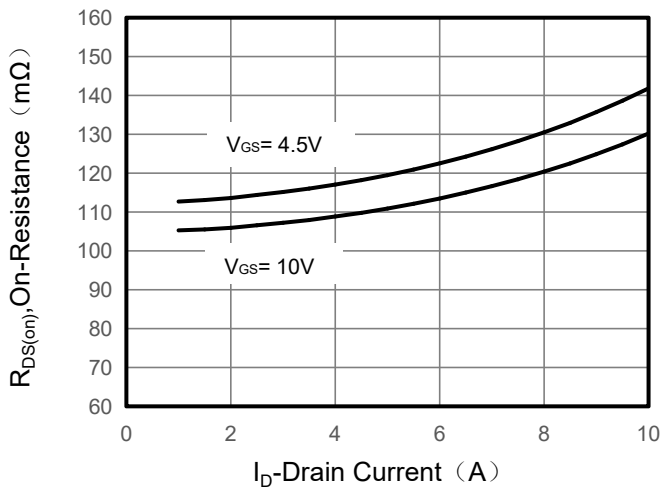
**Figure 1. Output Characteristics**



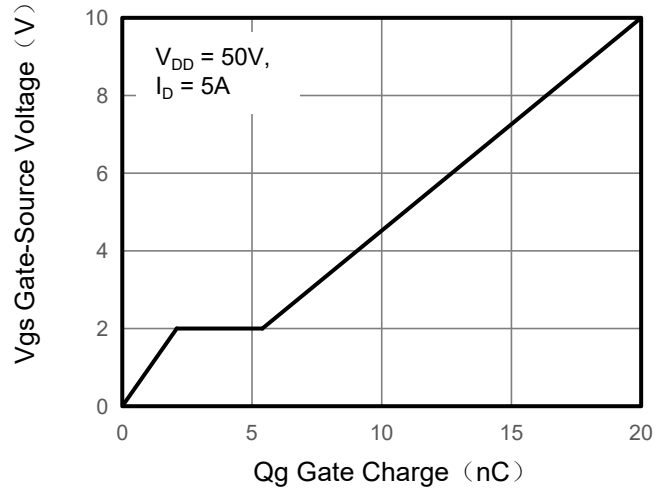
**Figure 2. Transfer Characteristics**



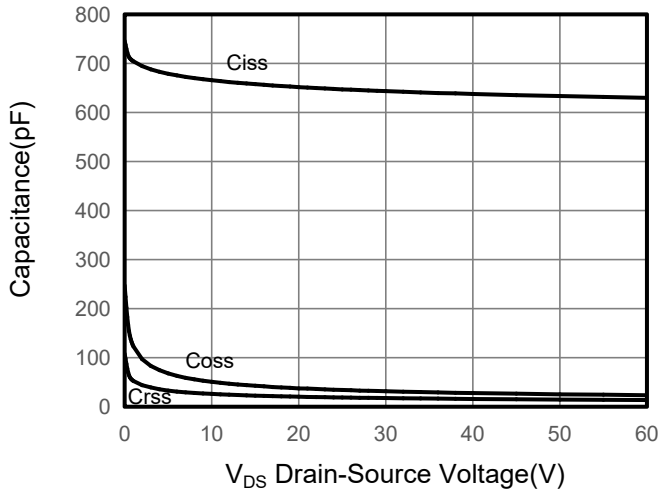
**Figure 3. Drain Source On Resistance**



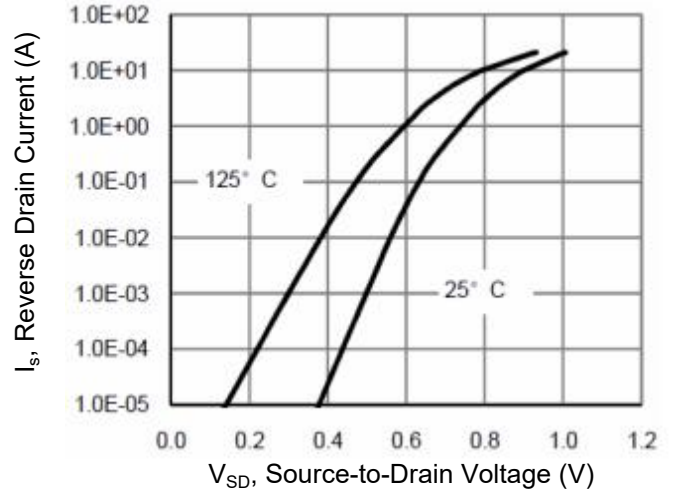
**Figure 4. Gate Charge**



**Figure 5. Capacitance**



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



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Drain-Source On-Resistance

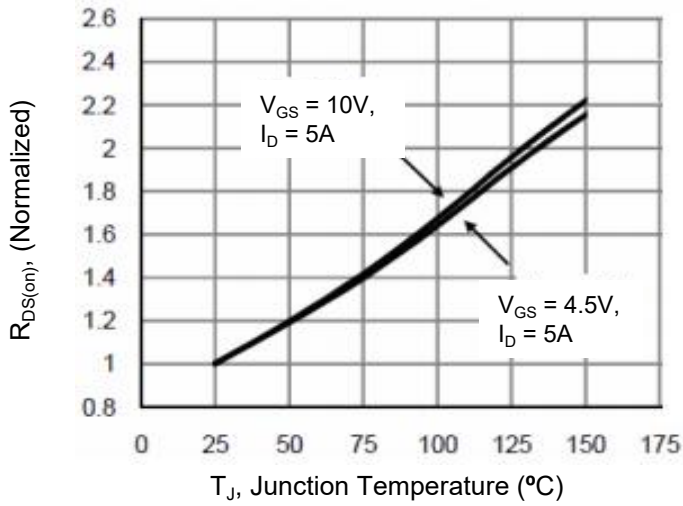


Figure 8. Safe Operation Area

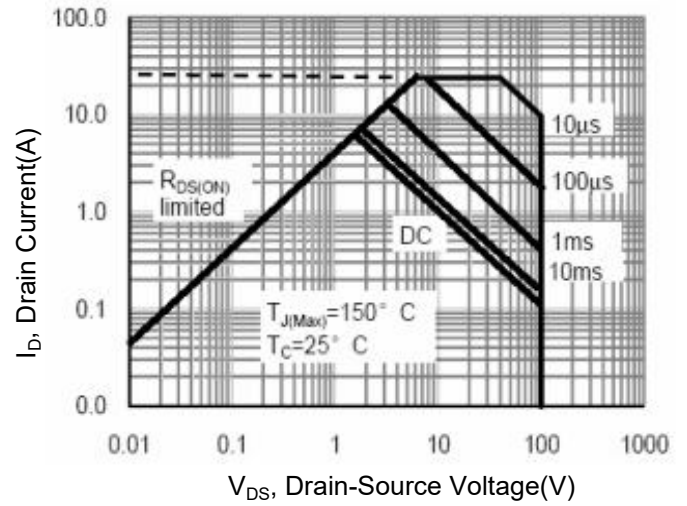
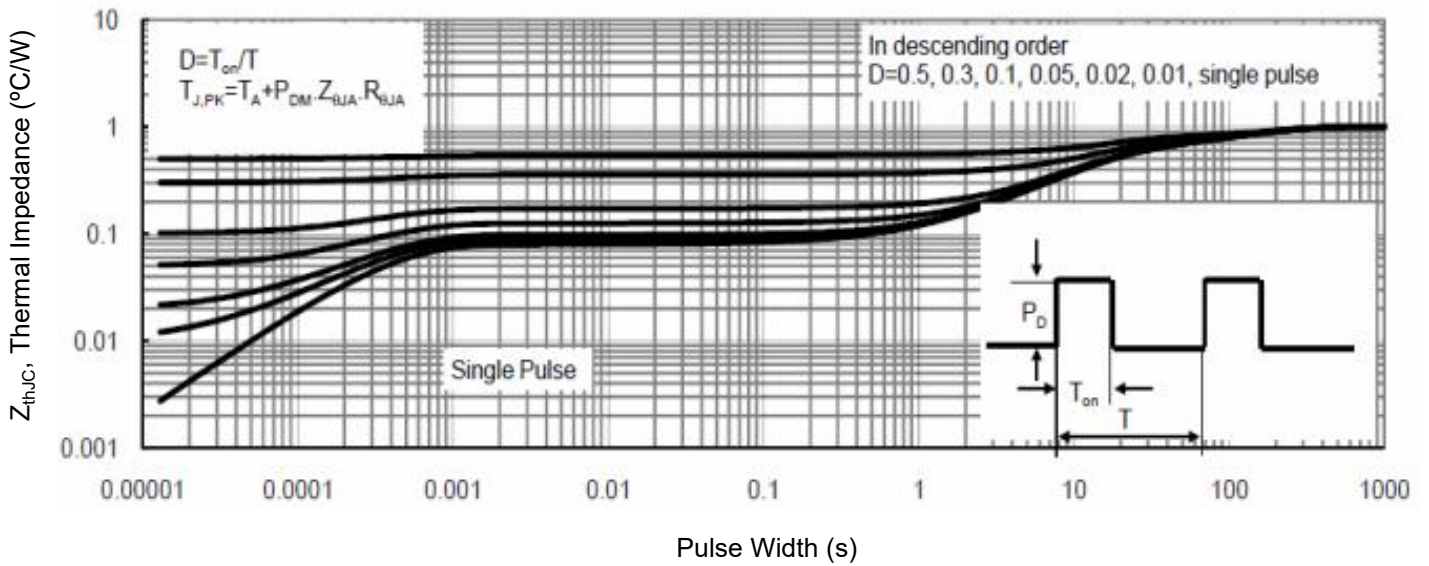
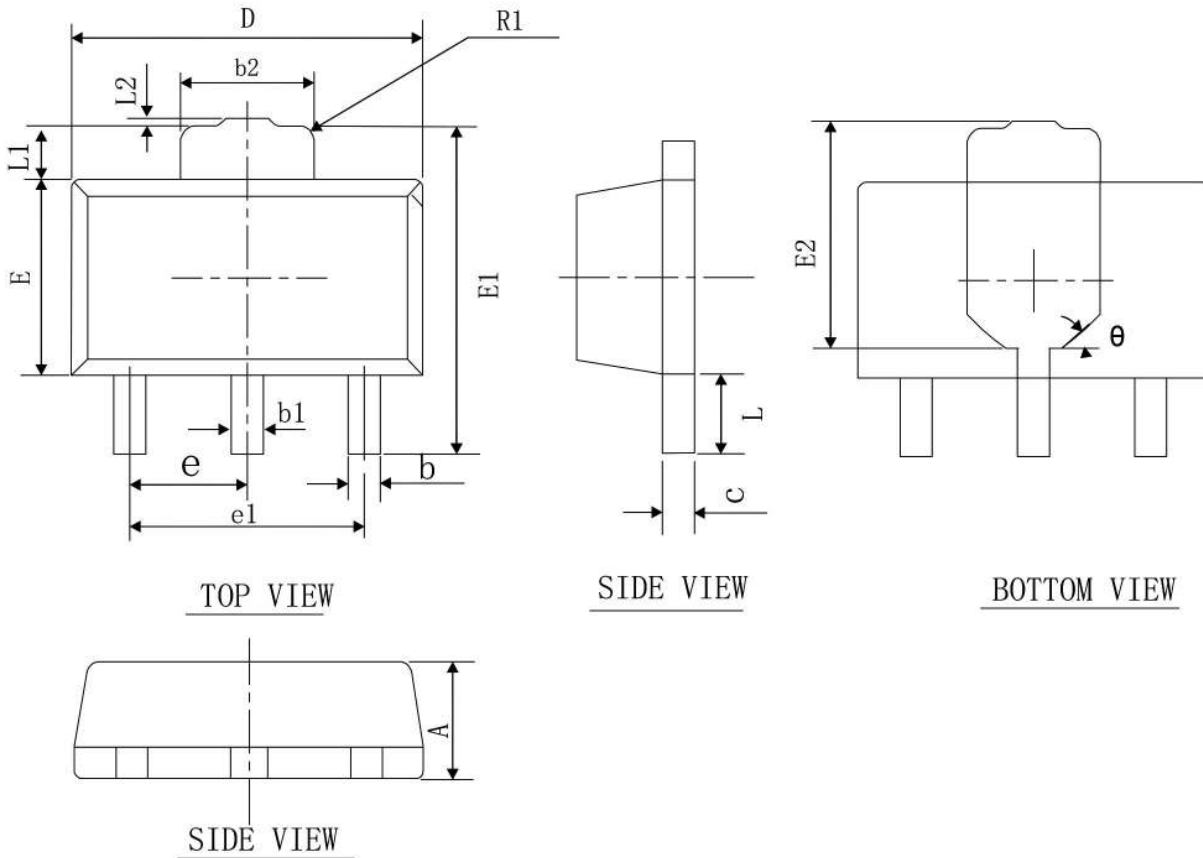


Figure 9. Normalized Maximum Transient Thermal Impedance



## SOT-89 Package Information



SYMBOL	MIN	NOM	MAX
A	1.40	1.50	1.60
b	0.36	0.40	0.50
b1	0.44	0.48	0.58
b2	1.60	1.70	1.80
c	0.35	0.40	0.45
D	4.40	4.50	4.60
E	2.40	2.50	2.60
E1	4.00	4.20	4.40
E2	2.65	2.85	3.05
e1	2.80	3.00	3.20
L	0.90	1.00	1.10
L1	0.60	0.70	0.80
L2	0.075 REF		
R1	0.2 BSC		
$\theta$	45° TYP		
e	1.5 BSC		