DNSS138K

DNSS138K
N-Channel MOSFET

General description
N-Channel MOSFET

FEATURES
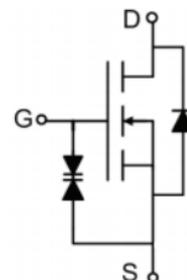- V_{DS}=50V
- I_D=0.22A
- $R_{DS(ON)}$(at V_{GS}=10V)＜3.5 Ω
- $R_{DS(ON)}$(at V_{GS}=4.5V)＜6Ω
- Trench Power MOSFET technology
- High density cell design for low $R_{DS(ON)}$

APPLICATIONS
- Direct Logic-Level Interface: TTL/CMOS
- Battery Operated Systems
- Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.

SOT-23 Package

Device Marking Code:

Device Type	Device Marking
DNSS138K	SS*

Maximum Ratings & Thermal Characteristics

(Ratings at 25℃ ambient temperature unless otherwise specified.)

Parameters	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	0.22	A
Power Dissipation	P_D	350	mW
Junction Temperature	T_j	150	℃
Storage Temperature	Tstg	-50-+150	℃
Thermal Resistance From Junction to Ambient	$R_{θJA}$	357	℃/W

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Electrical Characteristics

(Ratings at 25℃ ambient temperature unless otherwise specified.)

Parameter	Symbols	Test Condition	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	50			V
Gate-Threshold voltage(note1)	V GS (th)	VDS=VGS, ID=1mA	0.8		1.5	V
Gate-body Leakage	IGSS	VDS=0V, VGS=±20V			±100	nA
Zero Gate Voltage Drain current	IDSS	VDS=50V, VGS=0V			0.5	uA
		VDS=30V, VGS=0V			0.1	
Drain-Source On-Resistance (note1)	RDS(ON)	VGS=10V, ID=0.22A			3.5	Ω
		VGS=4.5V, IC=0.22A			6	
Forward trans conductance (note1)	gfs	VDS=10V, ID=0.22A	0.12			S
Diode forward voltage(note1)	VSD	IS=0.44A, VGS=0V			1.4	V
Dynamic(note2)						
Input capacitance	Ciss	VDS=25V, VGS=0V,f=1MHz		27		pF
Output capacitance	Coss			13		
Reverse Transfer capacitance	Crss			6		
Switching(note1,2)						
Turn-on Time	td(on)	VDD=30V, RGEN=6Ω, VDS=10V, ID≈0.29A,		5		ns
Rise time	tr			18		
Turn-off Time	td(off)				36	
Fall time	tf				14	

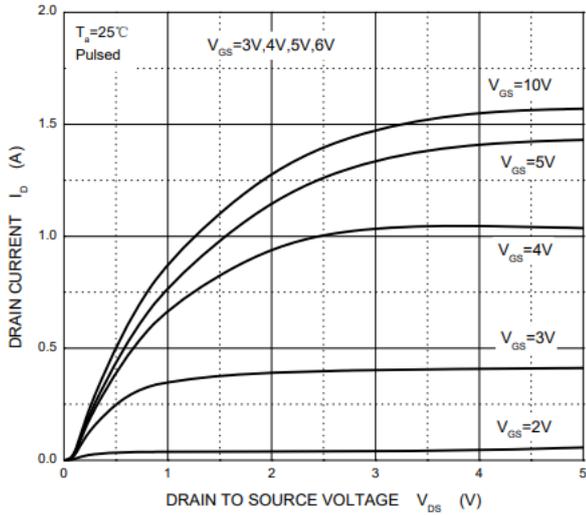Notes: 1. Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%.
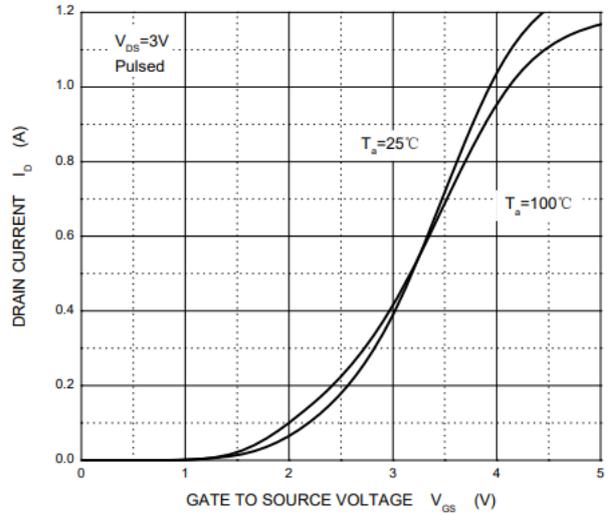   2. These parameters have no way to verify

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Typical Characteristics

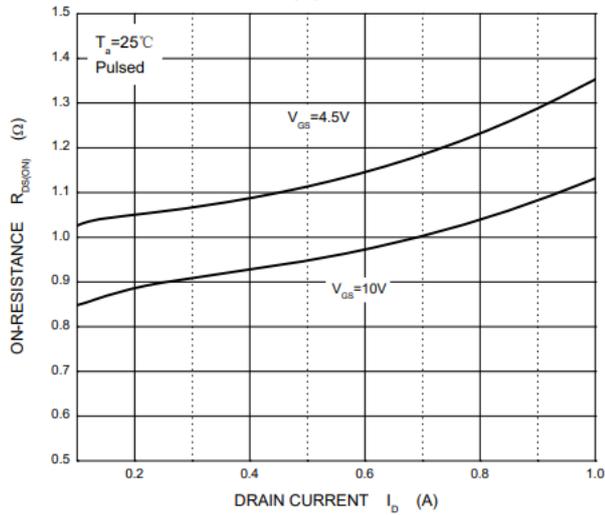### Output Characteristics

$T_a=25℃$
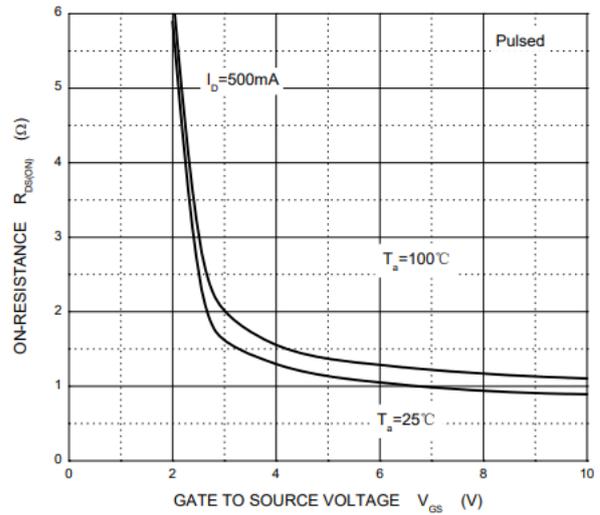Pulsed

$V_{GS}=3V,4V,5V,6V$

$V_{GS}=10V$

$V_{GS}=5V$

$V_{GS}=4V$

$V_{GS}=3V$

$V_{GS}=2V$

DRAIN CURRENT I_D (A)

DRAIN TO SOURCE VOLTAGE V_{DS} (V)

Transfer Characteristics

$V_{DS}=3V$
Pulsed

$T_a=25℃$

$T_a=100℃$

DRAIN CURRENT I_D (A)

GATE TO SOURCE VOLTAGE V_{GS} (V)

$R_{DS(ON)}$ —— I_D

$T_a=25℃$
Pulsed

$V_{GS}=4.5V$

$V_{GS}=10V$

ON-RESISTANCE $R_{DS(ON)}$ (Ω)

DRAIN CURRENT I_D (A)

$R_{DS(ON)}$ —— V_{GS}

Pulsed

$I_D=500mA$

$T_a=100℃$

$T_a=25℃$

ON-RESISTANCE $R_{DS(ON)}$ (Ω)

GATE TO SOURCE VOLTAGE V_{GS} (V)

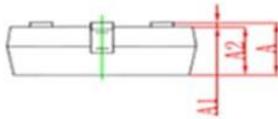### I_S —— V_{SD}

Pulsed

$T_a=100℃$

$T_a=25℃$

SOURCE CURRENT I_S (A)

SOURCE TO DRAIN VOLTAGE V_{SD} (V)

Threshold Voltage

$I_D=250uA$

THRESHOLD VOLTAGE V_{TH} (V)

JUNCTION TEMPERATURE T_j (℃)
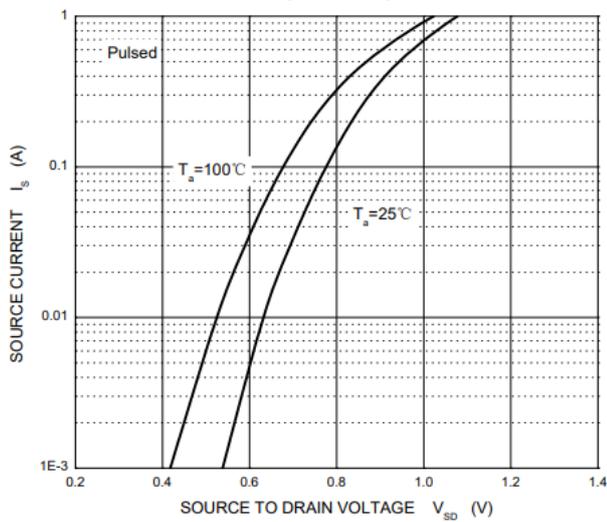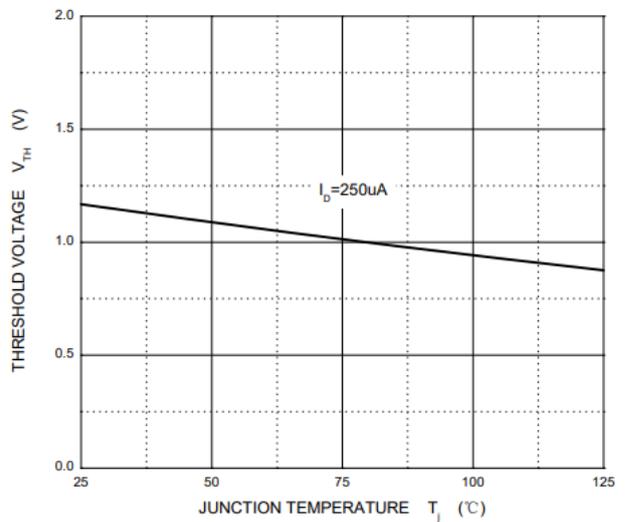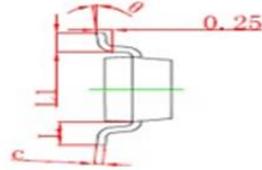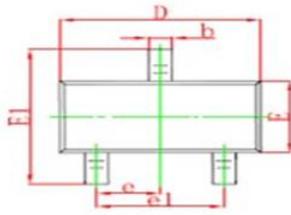
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SOT-23 Package information

Symbol	Dimentions in Millimeter		Dimentions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950Type		0.037Type	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.220REF	
L1	0.300	0.500	0.012	0.020
θ	0 °	8 °	0 °	8 °

SOT-23 Suggested Pad Layout
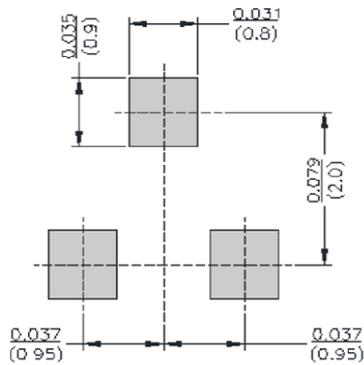
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