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NX138AKSX-TP

N-Channel MOSFET

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Product Summary

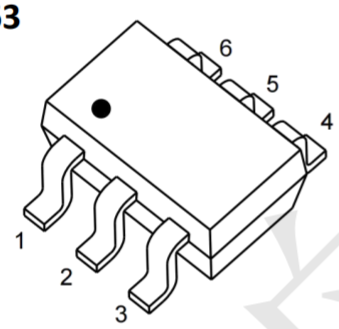
- V_{DS} 50 V
- I_{DS} 0.36A
- $R_{DS\ (ON)}$ (at V_{GS}=10V) <2Ω
- $R_{DS\ (ON)}$ (at V_{GS}=4.5V) <2.5Ω

Application

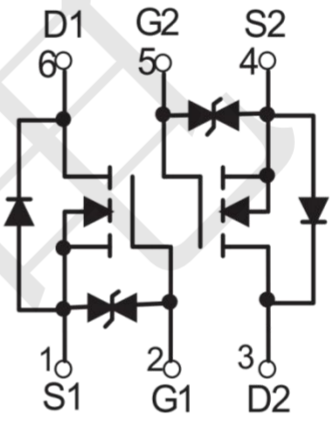
- Reverse Battery protection
- Load switch
- Power management
- Motor Control

Package and Pin Configuration

SOT363



Circuit diagram



Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	0.36	A
Pulsed Drain Current (tp = 10μs)	I_{DM}	1.5	A
Total Power Dissipation	P_{DTOT}	0.35	W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	PCB Mount (Note)	R_{thJA}	833	°C/W

Note : When mounted on 1" square PCB (FR4 material).

Electrical Characteristics (T_A=25℃unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 250μA	BV_{DSS}	50	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS}, I_D= 250μA	$V_{GS(th)}$	0.8	1.0	1.5	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±10V	I_{GSS}	--	--	±10	μA
Zero Gate Voltage Drain Current	V_{DS}= 20V, V_{GS}=0V	I_{DSS}	--	--	1	μA
	V_{DS}= 20V, T_J=125°C		--	--	50	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}= 10V, I_D= 0.5A	R_{DS}(on)	--	1.5	2.0	Ω
	V_{GS}= 4.5V, I_D= 0.2A		--	1.7	2.5	
	V_{GS}= 2.5V, I_D= 0.1A		--	2.0	4.5	
Forward Transconductance (Note 2)	V_{DS}= 10V, I_D= 0.5A	g_{fs}	--	16	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V_{DS} = 25V, I_D = 0.2A, V_{GS} = 10V	Q_g	--	4	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	0.5	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	0.4	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, F= 1.0MHz	C_{iss}	--	32	--	pF
Output Capacitance		C_{oss}	--	6	--	
Reverse Transfer Capacitance		C_{rss}	--	3	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DS} = 25V, I_D= 0.2A, V_{GS} = 10V, R_{GEN} = 6Ω	$t_{d(on)}$	--	2.2	--	nS
Rise Time (Note 3)		t_r	--	19.2	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	6.2	--	
Fall Time (Note 3)		t_f	--	23	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = 0.2A	V_{SD}	--	0.8	1.2	V

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

TYPICAL CHARACTERISTICS

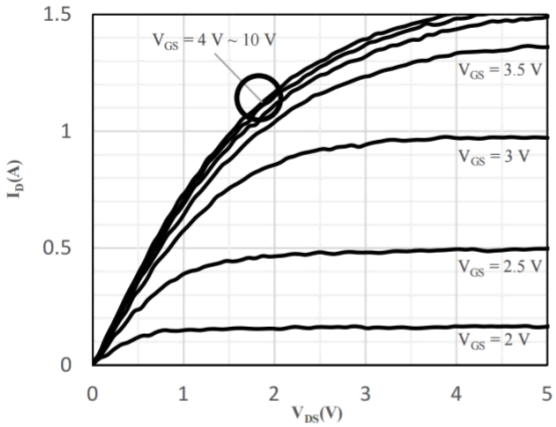


Fig 1 Typical Output Characteristics

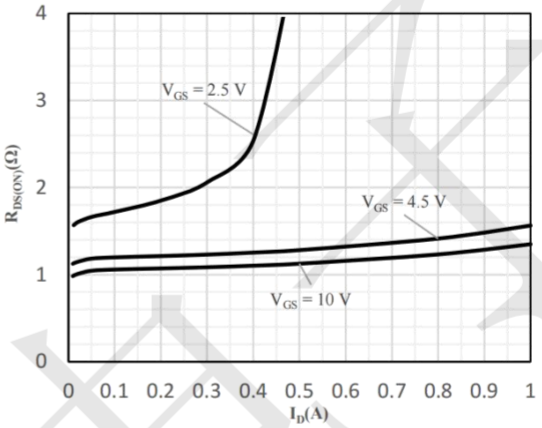


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

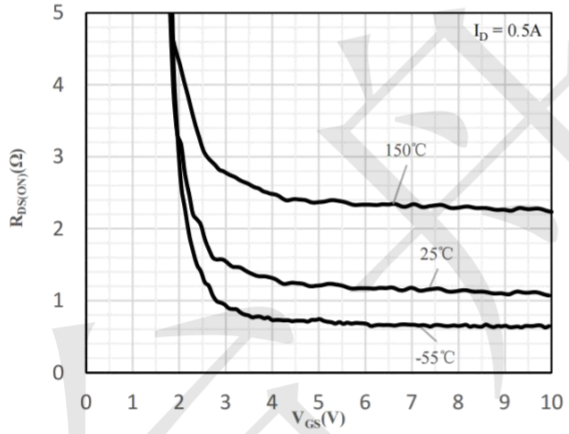


Fig 3 On-Resistance vs. Gate-Source Voltage

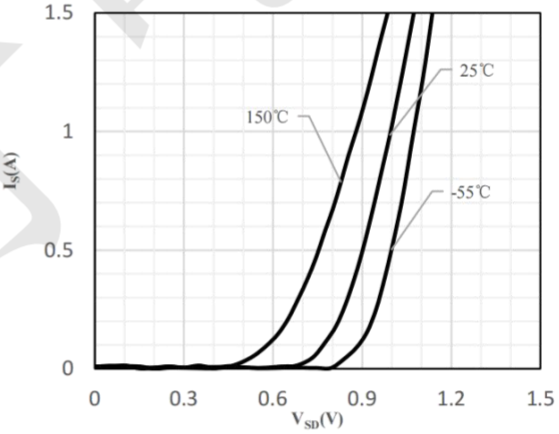


Fig 4 Body-Diode Characteristics

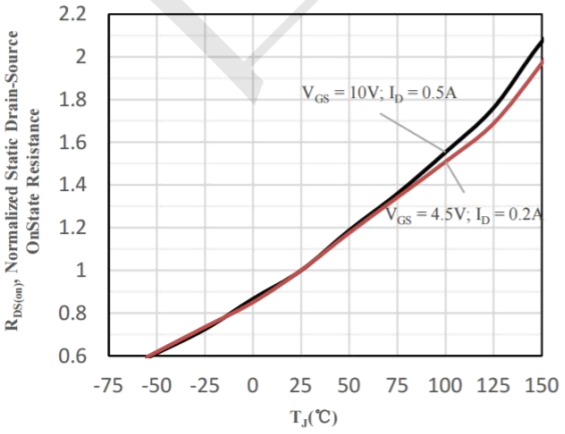


Fig 5 Normalized On-Resistance vs. Junction

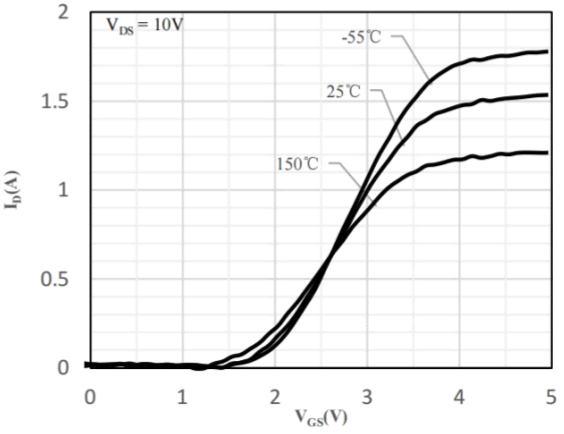
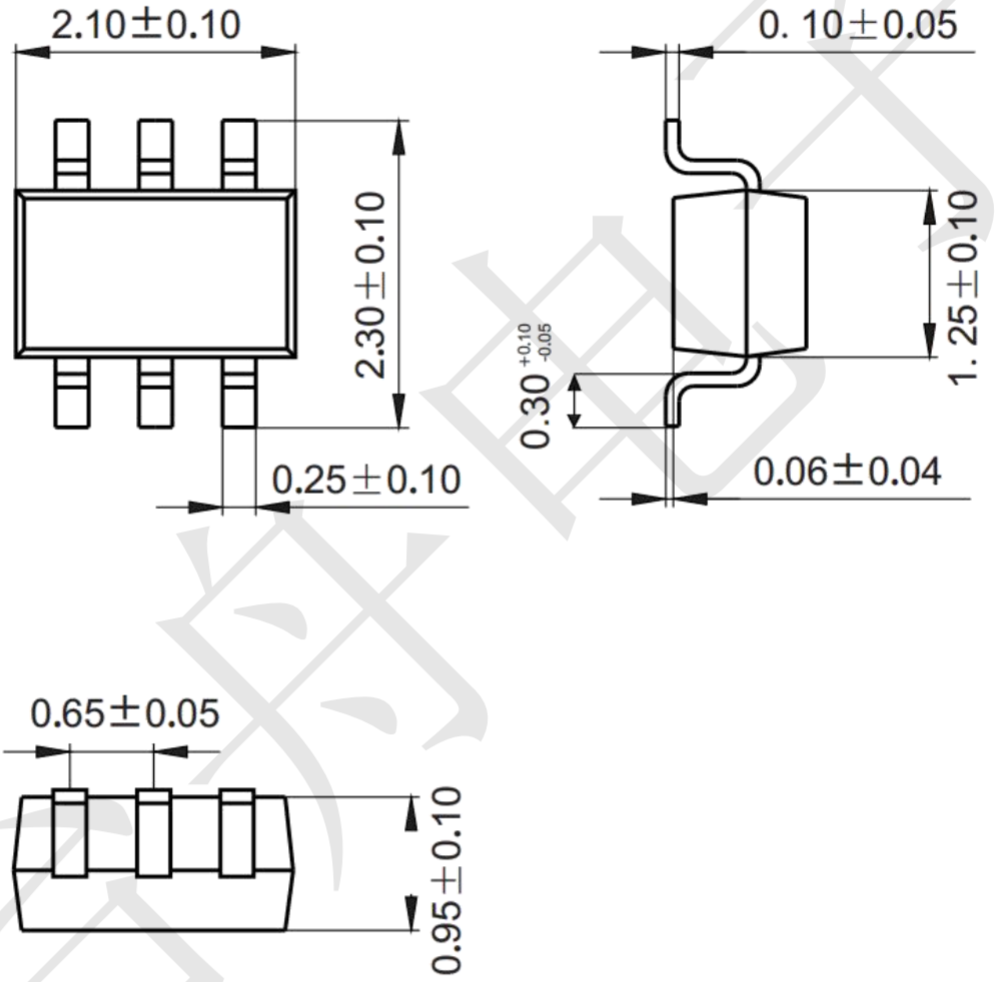


Fig 6 Transfer Characteristics

Package Outline & Dimensions (unit: mm)

SOT-363



Mounting Pad Layout (unit: mm)

