

SuperMOS – SOT-23 100V  $BV_{DSS}$ , 90m $\Omega$   $R_{DS(ON)}$ , N-channel MOSFET

1. Description

The 5N10S is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product 5N10S is Pb-free.

2. Features

- 100V,  $R_{DS(ON)}$ =90m $\Omega$ (TYP.) @ $V_{GS}$ =10V  
 $R_{DS(ON)}$ =120m $\Omega$ (TYP.) @ $V_{GS}$ =4.5V
- Use trench MOSFET technology
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

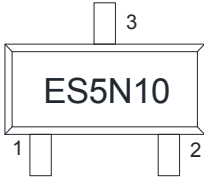
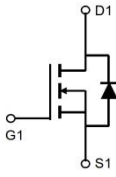
3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
5N10S	SOT-23	ES5N10	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$BV_{DSS}$	100	V
Gate-Source Voltage		$V_{GS}$	±20	V
Continuous Drain Current	$T_A=25^{\circ}\text{C}$	$I_D$	2.6	A
	$T_A=75^{\circ}\text{C}$		2	
Maximum Power Dissipation		$P_D$	1.4	W
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	10.4	A
Operating Junction Temperature		$T_J$	150	°C
Lead Temperature		$T_L$	260	°C
Storage Temperature Range		$T_{stg}$	-55 to 150	°C

### Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>B</sup>	$R_{\theta JA}$		90	°C/W

Note:

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85inch x 0.062 inch.

## 5N10S

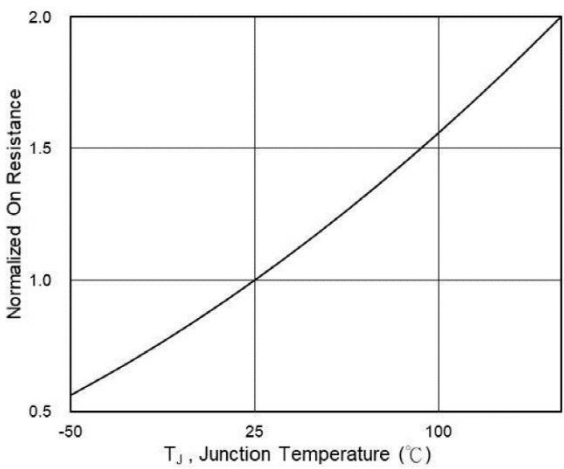
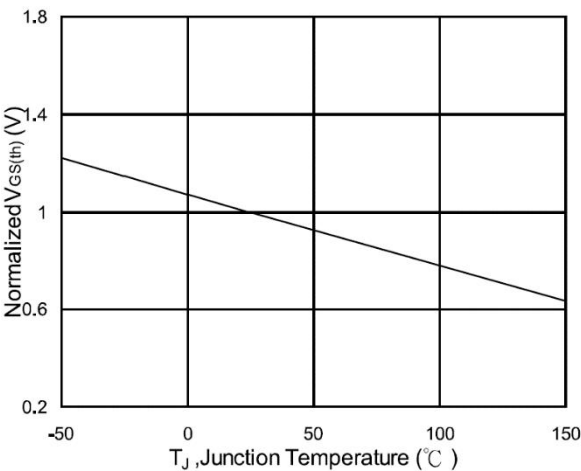
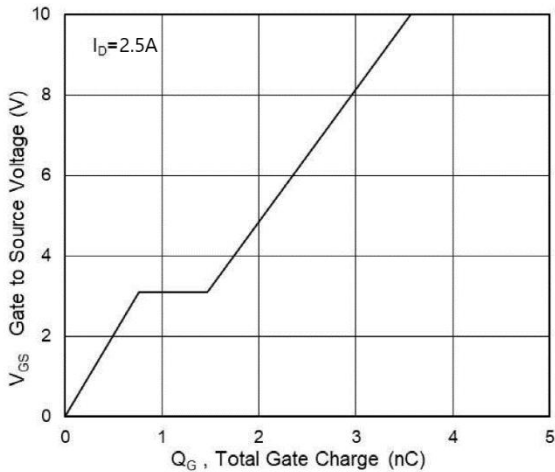
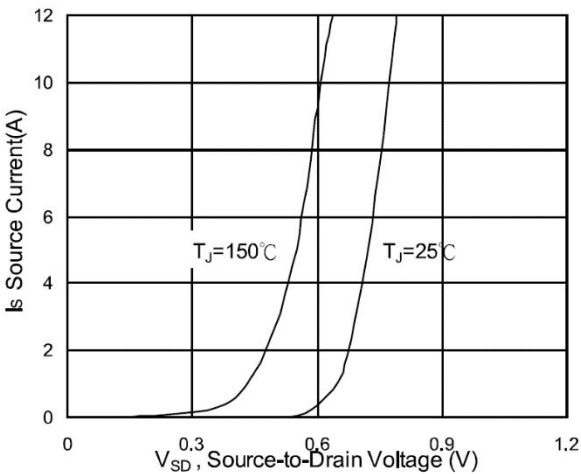
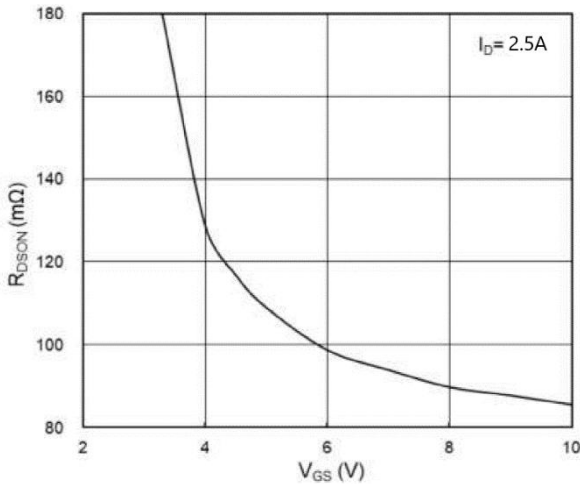
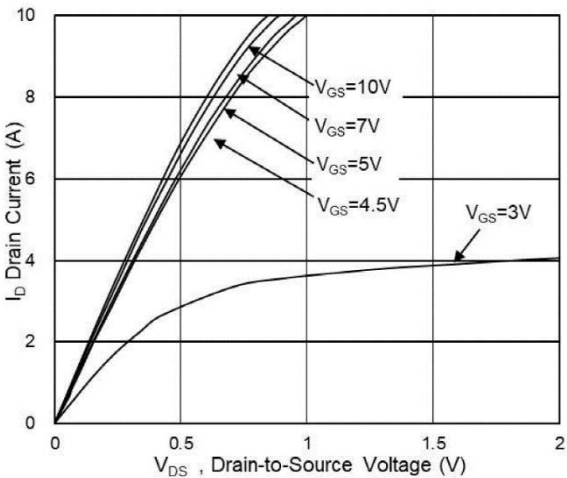
Rev-1.3

## Electrical Characteristics

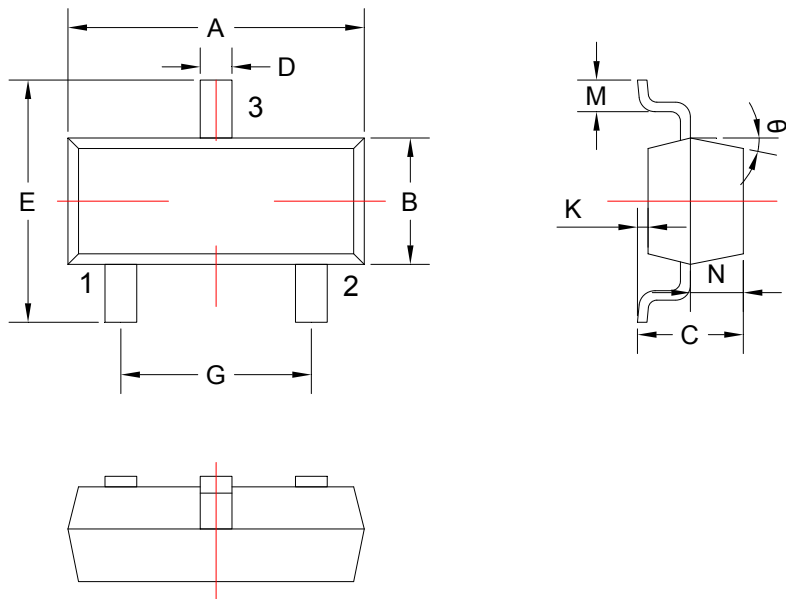
At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	uA
Gate-to-source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.0	1.65	2.5	V
Drain-to-source On-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A		90	135	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A		120	195	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, f=1MHz, V <sub>DS</sub> =25V		206		pF
Output Capacitance	C <sub>OSS</sub>			29		
Reverse Transfer Capacitance	C <sub>RSS</sub>			1.4		
Total Gate Charge	Q <sub>G(TOT)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =25V, I <sub>D</sub> =2.5A		4.2		nC
Gate-to-Source Charge	Q <sub>GS</sub>			1.5		
Gate-to-Drain Charge	Q <sub>GD</sub>			1.1		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t <sub>d(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =25V, I <sub>D</sub> =2.5A, R <sub>G</sub> =2Ω		14.7		ns
Rise Time	t <sub>r</sub>			3.5		
Turn-Off Delay Time	t <sub>d(OFF)</sub>			20.9		
Fall Time	t <sub>f</sub>			2.7		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1.0A		0.8	1.5	V

7. Typical Characteristic



8. Dimension (SOT-23)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	2.85	3.04	G	1.80	2.00
B	1.20	1.40	K	0	0.10
C	0.90	1.10	M	0.20	-
D	0.40	0.50	N	0.50	0.70
E	2.25	2.55	θ	5°	9°

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