

**SuperMOS –TO-252, 100V  $BV_{DSS}$ , 100m $\Omega$   $R_{DS(on)}$ , N-channel MOSFET**

**1. Description**

The NCE01P18K-ES 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 NCE01P18K-ES is Pb-free.

**2. Features**

- 100V,  $R_{DS(ON)}=100m\Omega$ (Typ.) @ $V_{GS}=10V$
- $R_{DS(ON)}=110m\Omega$ (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

**100% UIS TESTED**

**4. Ordering Information**

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
NCE01P18K-ES	TO-252	ESNQ10R100 /LOT	Halogen free	Tape & Reel	2,500 PCS	UL 94V-0	13 Inches

Table-1 Ordering information

**5. Pin Configuration and Functions**

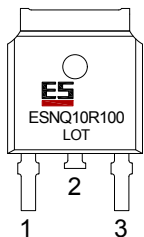
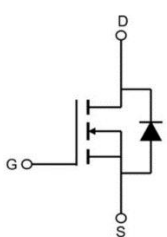
Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Drain		
3	Source		

Table-2 Pin configuration

## 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	$T_C=25^{\circ}C$	9	A	
	$T_C=75^{\circ}C$	7		
Maximum Power Dissipation	$T_C=25^{\circ}C$	$P_D$	20	W
Pulsed Drain Current	$I_{DM}$	36	A	
Avalanche Current Single Pulsed <sup>a</sup>	$I_{AS}$	4.5	A	
Avalanche energy Single Pulsed <sup>a</sup>	$E_{AS}$	5	mJ	
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-Case Thermal Resistance	$t \leq 10 \text{ s}$	$R_{\theta JC}$	6.3	°C/W	

Note:

a:  $V_{DD}=30V$ ,  $V_{GS}=10V$ ,  $L=0.5Mh$ ,  $R_G=25\Omega$ , Starting  $T_J=25^{\circ}C$ .

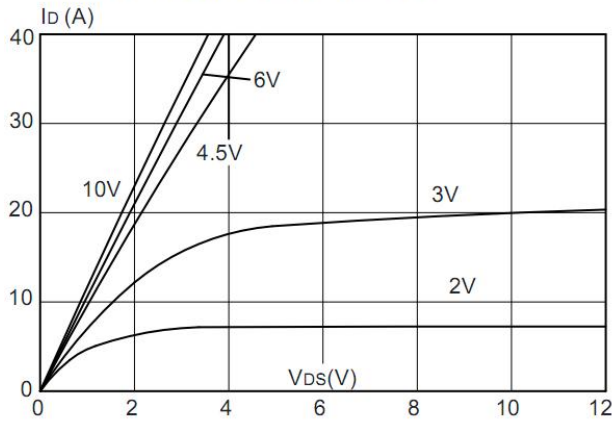
## Electrical Characteristics

At TA = 25°C unless otherwise specified

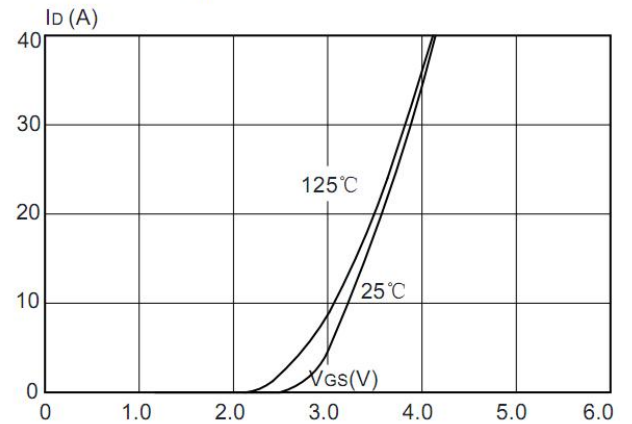
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			1.0	$\mu A$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	2.5	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$		100	115	m $\Omega$
		$V_{GS}=4.5V, I_D=3A$		110	140	
Forward Trans conductance	$g_{FS}$	$V_{DS}=5.0V, I_D=5A$			40	S
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, f=1MHz, V_{DS}=25V$		610		pF
Output Capacitance	$C_{OSS}$			40		
Reverse Transfer Capacitance	$C_{RSS}$			25		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=10V, V_{DS}=30V, I_D=5A$		14		nC
Gate-to-Source Charge	$Q_{GS}$			2.3		
Gate-to-Drain Charge	$Q_{GD}$			2.8		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=30V, I_D=5A, R_{GEN}=3\Omega$		8		ns
Rise Time	$t_r$			5.5		
Turn-Off Delay Time	$t_{d(OFF)}$			15.8		
Fall Time	$t_f$			6.9		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$	0.45		1.2	V

7. Typical Characteristic

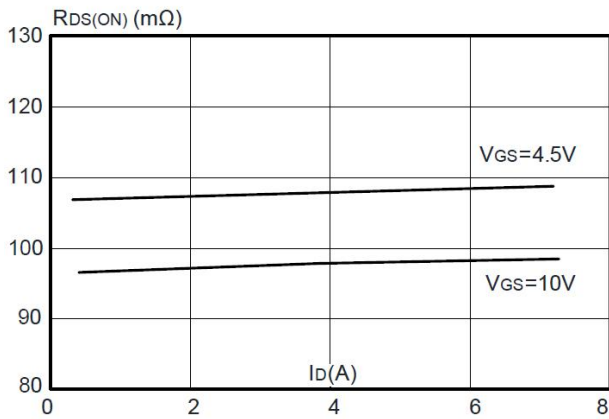
**Figure 1: Output Characteristics**



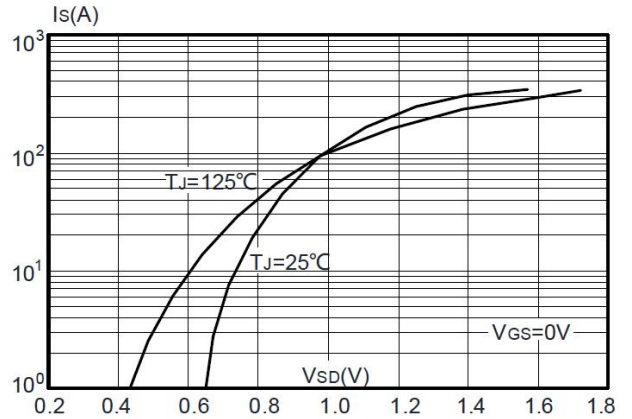
**Figure 2: Typical Transfer Characteristics**



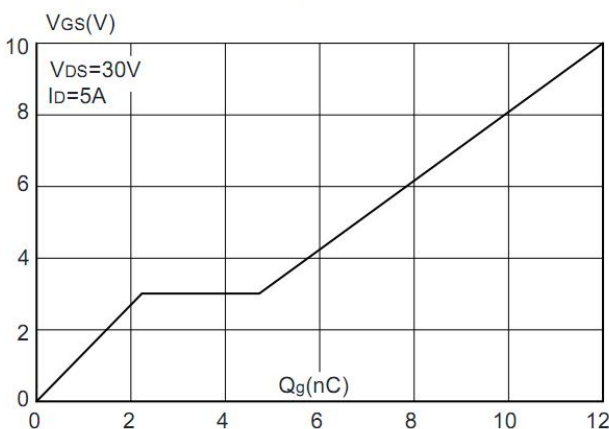
**Figure 3: On-resistance vs. Drain Current**



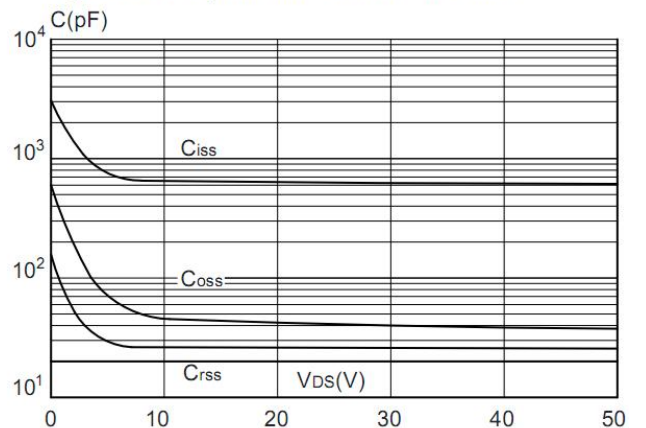
**Figure 4: Body Diode Characteristics**



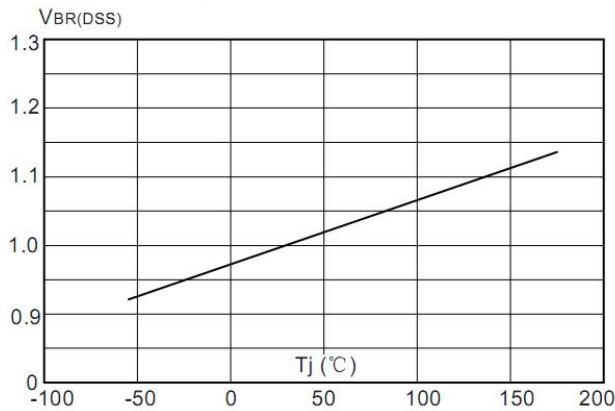
**Figure 5: Gate Charge Characteristics**



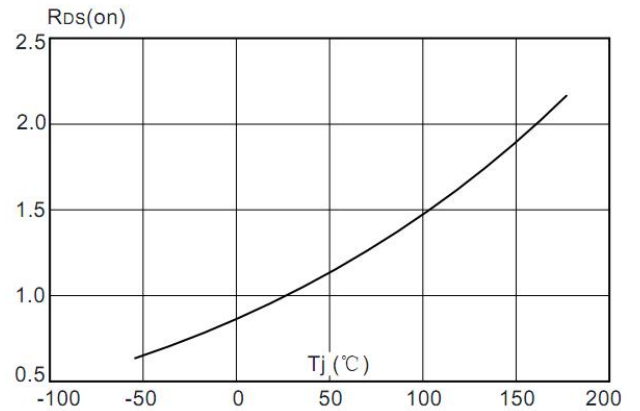
**Figure 6: Capacitance Characteristics**



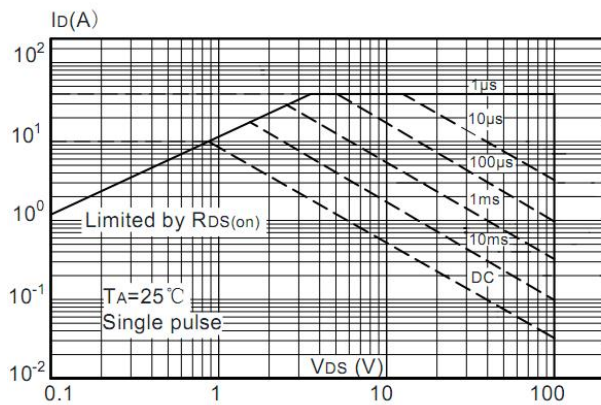
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



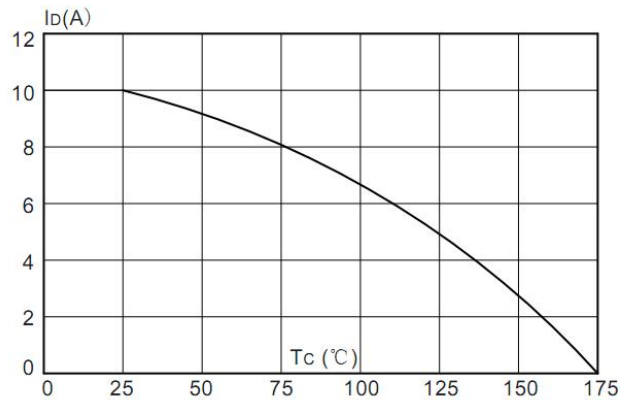
**Figure 8:** Normalized on Resistance vs. Junction Temperature



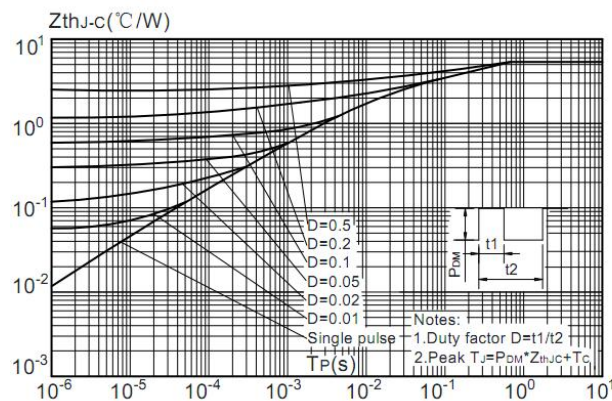
**Figure 9:** Maximum Safe Operating Area



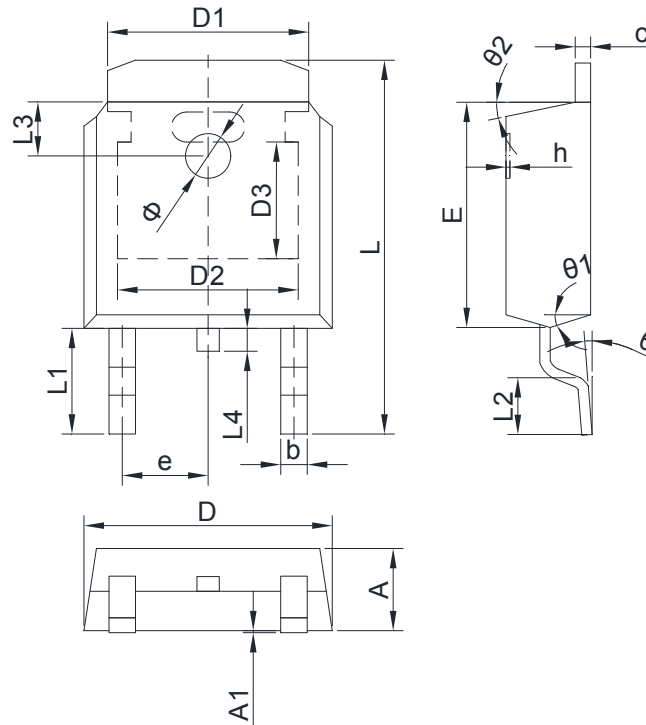
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



8. Dimension (TO-252)



SYMBOL	MILLIMETER			SYMBOL	MILLIMETER		
	MIN	Typ.	MAX		MIN	Typ.	MAX
A	2.200	2.300	2.400	h	0.000	0.100	0.200
A1	0.000		0.127	L	9.900	10.100	10.300
b	0.640	0.690	0.740	L1	2.888 REF		
C(电镀后)	0.460	0.520	0.580	L2	1.400	1.550	1.700
D	6.500	6.600	6.700	L3	1.600 REF		
D1	5.334 REF			L4	0.600	0.800	1.000
D2	4.826 REF			Φ	1.100	1.200	1.300
D3	3.166 REF			θ	0°		8°
E	6.000	6.100	6.200	θ1	9° TYP		
e	2.286 TYP			θ2	9° TYP		

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