

# NCE N-Channel Enhancement Mode Power MOSFET

## Description

The NCE0157A2 uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

### **General Features**

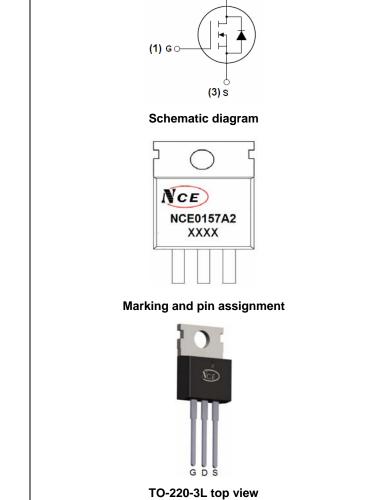
- $V_{DS} = 100V, I_D = 57A$  $R_{DS(ON)} < 17.5m\Omega @ V_{GS} = 10V$  (Typ:14.5m $\Omega$ )
- Special process technology for high ESD capability
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E<sub>AS</sub>
- Excellent package for good heat dissipation

## Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

100% UIS TESTED!

**100% ΔVds TESTED!** 



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#### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
NCE0157A2	NCE0157A2	TO-220-3L	-	-	-

#### Absolute Maximum Ratings (T<sub>c</sub>=25<sup>°</sup>C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	Vds	100	V
Gate-Source Voltage	Vgs	±20	V
Drain Current-Continuous	Ι <sub>D</sub>	57	А
Drain Current-Continuous(T <sub>C</sub> =100℃)	I <sub>D</sub> (100℃)	40	А
Pulsed Drain Current	I <sub>DM</sub>	160	А
Maximum Power Dissipation	PD	160	W
Derating factor	-	1.06	W/°C
Single pulse avalanche energy (Note 5)	E <sub>AS</sub>	580	mJ





NCE0157A2

Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 175	°C

#### **Thermal Characteristic**

Thermal Resistance, Junction-to-Case <sup>(Note 2)</sup>	$R_{ ext{ heta}JC}$	0.94	°C/W
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## Electrical Characteristics (T<sub>c</sub>=25°C unless otherwise noted)

$\begin{array}{ c c c c c } \hline Off Characteristics \\ \hline Drain-Source Breakdown Voltage BV_{DS} & V_{GS}=0V I_D=250 \mu A & 100 & 110 & - \\ \hline Zero Gate Voltage Drain Current I_{DSS} & V_{DS}=100V, V_{GS}=0V & - & - & 1 \\ \hline Gate-Body Leakage Current I_{GSS} & V_{GS}=\pm20V, V_{DS}=0V & - & - & \pm100 \\ \hline On Characteristics ^{(Note 3)} & \\ \hline Gate Threshold Voltage & V_{GS(th)} & V_{DS}=V_{GS}, I_D=250 \mu A & 2 & 3 & 4 \\ \hline Drain-Source On-State Resistance & R_{DS(ON)} & V_{GS}=10V, I_D=28A & - & 14.5 & 17.5 \\ \hline Forward Transconductance & G_{FS} & V_{DS}=25V, I_D=28A & 32 & - & - \\ \hline Dynamic Characteristics ^{(Note 4)} & & \\ Input Capacitance & C_{Iss} & V_{DS}=25V, V_{GS}=0V, \\ \hline Cutput Capacitance & C_{Iss} & V_{DS}=25V, V_{GS}=0V, \\ \hline Reverse Transfer Capacitance & C_{rss} & F=1.0MHz & - & 182.5 & - \\ \hline Switching Characteristics ^{(Note 4)} & & \\ Turn-on Delay Time & t_{q(on)} & V_{DD}=30V, I_D=2A, R_L=15\Omega & - & \\ \hline Turn-Onf Delay Time & t_{q(off)} & V_{DS}=30V, I_D=30A, \\ \hline Turn-Off Fall Time & t_{f} & \\ \hline Total Gate Charge & Q_{g} & V_{OS}=10V & & - & \\ \hline Case Source Charge & Q_{gd} & V_{OS}=10V & - & 57.1 & - \\ \hline Drain-Source Diode Characteristics \\ \hline Diode Forward Voltage (^{Note 3}) & V_{SD} & V_{GS}=0V, I_S=28A & - & 0.85 & 1.2 \\ \hline \end{array}$	Unit	Мах	Тур	Min	Condition	Parameter Symbol Condition	
$ \begin{array}{ c c c c } \hline Zero Gate Voltage Drain Current & I_{DSS} & V_{DS}=100V, V_{GS}=0V & - & 1 & 1 \\ \hline Gate-Body Leakage Current & I_{GSS} & V_{GS}=\pm 20V, V_{DS}=0V & - & \pm 100 \\ \hline On Characteristics (^{Nole 3}) & \\ \hline Gate Threshold Voltage & V_{GS(fh)} & V_{DS}=V_{GS}, I_D=250 \mu A & 2 & 3 & 4 & \\ \hline Drain-Source On-State Resistance & R_{DS(ON)} & V_{GS}=10V, I_D=28A & - & 14.5 & 17.5 & \\ \hline Forward Transconductance & g_{FS} & V_{DS}=25V, I_D=28A & 32 & - & \\ \hline Dynamic Characteristics (^{Nole 4)} & & \\ \hline Unput Capacitance & C_{ISS} & V_{DS}=25V, V_{GS}=0V, \\ \hline Coutput Capacitance & C_{rss} & & \\ \hline Switching Characteristics (^{Nole 4)} & & \\ \hline Turn-on Delay Time & t_{d(on)} & & \\ Turn-Off Delay Time & t_{d(onf)} & & \\ \hline Turn-Off Delay Time & t_{d(onf)} & & \\ \hline Turn-Off Fall Time & t_{t} & \\ \hline Total Gate Charge & Q_{g} & \\ \hline Cust & Q_{gs} = 10V, I_D=30A, \\ \hline Gate Charge & Q_{gs} & \\ \hline Cust & Q_{gs} = 10V & \\ \hline Cust & Q_{GS}=10V & \\ \hline Cust & Q_{GS} = 10V & \\ \hline Cust & Q_{GS} & \\ \hline Cust & Q_{SS} = 0V, I_S=28A & \\ \hline Cust & Q_{SS} & \\ \hline Cust & \\ \hline Cust & Q_{SS} & \\ \hline Cust & Q_{SS} & \\ \hline Cust & \\ \hline Cust & Q_{SS} & \\ \hline Cust & \\ \hline Cust & \\ \hline Cust & Q_{SS} & \\ \hline Cust & \\ \hline Cu$							Off Characteristics
Gate-Body Leakage Current         IGSS $V_{GS}=\pm 20V, V_{DS}=0V$ - $\pm 100$ On Characteristics (Note 3)         Gate Threshold Voltage $V_{GS}(th)$ $V_{DS}=V_{GS}, I_D=250 \mu A$ 2         3         4           Drain-Source On-State Resistance $R_{DS}(ON)$ $V_{GS}=10V, I_D=28A$ -         14.5         17.5           Forward Transconductance $g_{FS}$ $V_{DS}=25V, I_D=28A$ 32         -         -           Dynamic Characteristics (Note4) $V_{DS}=25V, V_{GS}=0V, F=10MHz$ -         3969         -           Output Capacitance $C_{ISS}$ $V_{DS}=25V, V_{GS}=0V, F=1.0MHz$ -         182.5         -           Reverse Transfer Capacitance $C_{rss}$ $V_{DS}=30V, I_D=2A, R_L=15\Omega, F=1.0MHz$ -         160.2         -           Switching Characteristics (Note 4)         Turn-on Rise Time         tr $V_{DD}=30V, I_D=2A, R_L=15\Omega, F=1.0MHz$ -         13         -           Turn-Off Delay Time         tdq(off) $V_{DS}=10V, R_G=2.5\Omega, F=1.0M, R_G=2.$	V	-	110	100	V <sub>GS</sub> =0V I <sub>D</sub> =250µA	BV <sub>DSS</sub>	Drain-Source Breakdown Voltage
On Characteristics (Note 3)         V <sub>GS</sub> (th)         V <sub>DS</sub> =V <sub>GS</sub> ,Ib=250µA         2         3         4           Gate Threshold Voltage         R <sub>DS</sub> (ON)         V <sub>GS</sub> =10V, Ib=28A         -         14.5         17.5           Forward Transconductance         g <sub>FS</sub> V <sub>DS</sub> =25V,Ib=28A         32         -         -           Dynamic Characteristics (Note4)           3969         -           Input Capacitance         C <sub>Iss</sub> V <sub>DS</sub> =25V,V <sub>GS</sub> =0V, F=1.0MHz         182.5         -           Output Capacitance         C <sub>Iss</sub> V <sub>DS</sub> =25V,V <sub>GS</sub> =0V, F=1.0MHz         182.5         -           Reverse Transfer Capacitance         C <sub>rss</sub> V <sub>DS</sub> =25V,V <sub>GS</sub> =0V, F=1.0MHz         180.2         -           Switching Characteristics (Note 4)          -         182.5         -           Turn-on Delay Time         td(on)         V <sub>DS</sub> =30V,Ib=2A,RL=15Ω         -         160.2         -           Turn-Off Delay Time         td(off)         V <sub>DS</sub> =30V,Ib=2A,RL=15Ω         -         13         -           Turn-Off Fall Time         t         -         16         -         -         -         16         -           Gate-Source Charge         Q <sub>g</sub> V <sub>DS</sub> =30V,Ib=30A, V <sub>GS</sub> =10V	μA	1	-	-	V <sub>DS</sub> =100V,V <sub>GS</sub> =0V	I <sub>DSS</sub>	Zero Gate Voltage Drain Current
Gate Threshold Voltage $V_{GS(th)}$ $V_{DS}=V_{GS}, I_D=250\muA$ 2         3         4           Drain-Source On-State Resistance $R_{DS(ON)}$ $V_{GS}=10V, I_D=28A$ 32         -         -           Forward Transconductance $g_{FS}$ $V_{DS}=25V, I_D=28A$ 32         -         -           Dynamic Characteristics (Note4) $C_{ISS}$ $V_{DS}=25V, V_{GS}=0V, F=10MHz$ 3969         -           Output Capacitance $C_{OSS}$ $F=1.0MHz$ -         182.5         -           Reverse Transfer Capacitance $C_{rss}$ $V_{DS}=25V, V_{GS}=0V, F=1.0MHz$ -         182.5         -           Switching Characteristics (Note 4) $C_{rss}$ $V_{DS}=30V, I_D=2A, R_L=150$ -         14.5         -           Turn-on Delay Time $t_{d(on)}$ $V_{SS}=10V, R_{S}=2.5\Omega$ -         13         -           Turn-Off Delay Time $t_{d(off)}$ $V_{DS}=30V, I_D=2A, R_L=15\Omega$ -         16         -           Turn-Off Fall Time $t_{d(off)}$ $V_{DS}=30V, I_D=30A, V_{GS}=10V$ -         16         -           Gate-Source Charge $Q_{g}$ $V_{GS}=10V$ -	nA	±100	-	-	V <sub>GS</sub> =±20V,V <sub>DS</sub> =0V	I <sub>GSS</sub>	Gate-Body Leakage Current
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$							On Characteristics (Note 3)
Forward Transconductance $g_{FS}$ $V_{DS}=25V, I_D=28A$ $32$ $-$ Dynamic Characteristics (Note4) $V_{DS}=25V, V_{GS}=0V, F=1.0MHz$ $ 3969$ $-$ Input Capacitance $C_{OSS}$ $V_{DS}=25V, V_{GS}=0V, F=1.0MHz$ $ 182.5$ $-$ Output Capacitance $C_{OSS}$ $V_{DS}=25V, V_{GS}=0V, F=1.0MHz$ $ 182.5$ $-$ Reverse Transfer Capacitance $C_{rss}$ $V_{DS}=25V, V_{GS}=0V, F=1.0MHz$ $ 182.5$ $-$ Switching Characteristics (Note 4) $F=1.0MHz$ $ 160.2$ $-$ Turn-on Delay Time $t_{d(on)}$ $V_{DD}=30V, I_D=2A, R_L=15\Omega$ $ 13$ $-$ Turn-Off Delay Time $t_d(off)$ $V_{SS}=10V, R_G=2.5\Omega$ $ 146.1$ $-$ Turn-Off Fall Time $t_f$ $V_{DS}=30V, I_D=30A, V_{GS}=10V$ $ 146.1$ $-$ Gate-Drain Charge $Q_{gd}$ $V_{GS}=10V$ $ 57.1$ $-$ Diode Forward Voltage (Note 3) $V_{SD}$ $V_{GS}=0V, I_S=28A$ $ 0$	V	4	3	2	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250µA	V <sub>GS(th)</sub>	Gate Threshold Voltage
Dynamic Characteristics (Note4)ClassVDS = 25V, VGS = 0V, F = 1.0MHz-3969-Output CapacitanceCoss $V_{DS} = 25V, V_{GS} = 0V,$ F = 1.0MHz-182.5-Reverse Transfer CapacitanceCrss $C_{rss}$ -160.2-Switching Characteristics (Note 4)Turn-on Delay Time $t_{d(on)}$ -17-Turn-on Rise Timetr $V_{DD} = 30V, I_D = 2A, R_L = 15\Omega$ -13-Turn-Off Delay Time $t_{d(off)}$ $V_{GS} = 10V, R_G = 2.5\Omega$ -16-Turn-Off Fall Timetr-16Total Gate ChargeQg $V_{DS} = 30V, I_D = 30A,$ $V_{GS} = 10V$ -146.1-Gate-Drain ChargeQgs $V_{GS} = 10V$ -57.1-Diode Forward Voltage (Note 3) $V_{SD}$ $V_{GS} = 0V, I_S = 28A$ -0.851.2	mΩ	17.5	14.5	-	V <sub>GS</sub> =10V, I <sub>D</sub> =28A	R <sub>DS(ON)</sub>	Drain-Source On-State Resistance
$ \begin{array}{ c c c c c } \hline \mbox{Input Capacitance} & C_{1ss} & V_{DS}=25V, V_{GS}=0V, \\ \hline \mbox{F}=1.0MHz & - & 182.5 & - & \\ \hline \mbox{Input Capacitance} & C_{rss} & F=1.0MHz & - & 182.5 & - & \\ \hline \mbox{Input Capacitance} & C_{rss} & F=1.0MHz & - & 160.2 & - & \\ \hline \mbox{Switching Characteristics}^{(Note 4)} & & & & & & \\ \hline \mbox{Switching Characteristics}^{(Note 4)} & & & & & & & & \\ \hline \mbox{Iurn-on Delay Time} & t_{d(on)} & & & & & & & & & \\ \hline \mbox{Iurn-on Rise Time} & tr & & V_{DD}=30V, I_{D}=2A, R_{L}=15\Omega & - & & & & & \\ \hline \mbox{Iurn-Off Delay Time} & t_{d(off)} & & & & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & tr & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & & \\ \hline \mbox{Iurn-Off Fall Time} & & & & & \\ \hline Iurn-Off Fall Tim$	S	-	-	32	V <sub>DS</sub> =25V,I <sub>D</sub> =28A	<b>g</b> fs	Forward Transconductance
$ \begin{array}{ c c c c c } \hline & & & & & & & & & & & & & & & & & & $							Dynamic Characteristics (Note4)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	PF	-	3969	-		C <sub>lss</sub>	Input Capacitance
Reverse Transfer Capacitance $C_{rss}$ -         160.2         -           Switching Characteristics (Note 4)         -         160.2         -           Turn-on Delay Time $t_{d(on)}$ $V_{DD}=30V, I_D=2A, R_L=15\Omega$ -         13         -           Turn-on Rise Time $t_{d(off)}$ $V_{DD}=30V, I_D=2A, R_L=15\Omega$ -         13         -           Turn-Off Delay Time $t_{d(off)}$ $V_{GS}=10V, R_G=2.5\Omega$ -         160.2         -           Turn-Off Fall Time $t_f$ $V_{DS}=30V, I_D=30A, V_{DS}=30V, I_D=30A, V_{GS}=10V$ -         146.1         -           Gate-Source Charge $Q_{gd}$ $V_{GS}=10V$ -         29.3         -           Diade Forward Voltage (Note 3) $V_{SD}$ $V_{GS}=0V, I_S=28A$ -         0.85         1.2	PF	-	182.5	-		C <sub>oss</sub>	Output Capacitance
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PF	-	160.2	-		C <sub>rss</sub>	Reverse Transfer Capacitance
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $							Switching Characteristics (Note 4)
$ \begin{array}{c c c c c c c } \hline Turn-Off Delay Time & t_{d(off)} & V_{GS}=10V, R_G=2.5\Omega & - & 55 & - \\ \hline Turn-Off Fall Time & t_{f} & & - & 16 & - \\ \hline Total Gate Charge & Q_{g} & & & & & & & & \\ \hline Total Gate Charge & Q_{gs} & & & & & & & & & & & \\ \hline Gate-Source Charge & Q_{gd} & & & & & & & & & & & & & & & \\ \hline Gate-Drain Charge & Q_{gd} & & & & & & & & & & & & & & & & & \\ \hline Drain-Source Diode Characteristics & & & & & & & & & & & & & & & \\ \hline Diode Forward Voltage^{(Note 3)} & V_{SD} & V_{SD} & V_{GS}=0V, I_{S}=28A & - & 0.85 & 1.2 \\ \hline \end{array} $	nS	-	17	-		t <sub>d(on)</sub>	Turn-on Delay Time
Turn-Off Fall Time         tr         -         16         -           Total Gate Charge         Qg         VDS=30V,ID=30A, VGS=10V         -         146.1         -           Gate-Source Charge         Qgs         VGS=10V         -         29.3         -           Gate-Drain Charge         Qgd         -         57.1         -           Drain-Source Diode Characteristics         VSD         VGS=0V,IS=28A         -         0.85         1.2	nS	-	13	-	$V_{DD}$ =30V, $I_D$ =2A, $R_L$ =15 $\Omega$	tr	Turn-on Rise Time
Total Gate Charge $Q_g$ $V_{DS}=30V,I_D=30A,$ $V_{GS}=10V$ -146.1-Gate-Source Charge $Q_{gs}$ $V_{GS}=10V$ -29.3-Gate-Drain Charge $Q_{gd}$ $V_{GS}=10V$ -57.1-Drain-Source Diode CharacteristicsDiode Forward Voltage (Note 3) $V_{SD}$ $V_{GS}=0V,I_S=28A$ -0.851.2	nS	-	55	-	V <sub>GS</sub> =10V,R <sub>G</sub> =2.5Ω	t <sub>d(off)</sub>	Turn-Off Delay Time
Gate-Source Charge         Qgs         VDS=30V,ID=30A, VGS=10V         -         29.3         -           Gate-Drain Charge         Qgd         VGS=10V         -         57.1         -           Drain-Source Diode Characteristics         VSD         VGS=0V,IS=28A         -         0.85         1.2	nS	-	16	-		t <sub>f</sub>	Turn-Off Fall Time
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	nC	-	146.1	-	\/20\/↓_20A	Qg	Total Gate Charge
Gate-Drain Charge         Q <sub>gd</sub> -         57.1         -           Drain-Source Diode Characteristics         V         VGS=0V,IS=28A         -         0.85         1.2	nC	-	29.3	-		Q <sub>gs</sub>	Gate-Source Charge
Diode Forward Voltage (Note 3)         V <sub>SD</sub> V <sub>GS</sub> =0V,I <sub>S</sub> =28A         -         0.85         1.2	nC	-	57.1	-	V <sub>GS</sub> =10V	Q <sub>gd</sub>	Gate-Drain Charge
			· ·				Drain-Source Diode Characteristics
	V	1.2	0.85	-	V <sub>GS</sub> =0V,I <sub>S</sub> =28A	V <sub>SD</sub>	Diode Forward Voltage (Note 3)
Diode Forward Current <sup>(Note 2)</sup> Is 57	А	57	-	-		Is	Diode Forward Current (Note 2)
Reverse Recovery Time $t_{rr}$ TJ = 25°C, IF = 28A-35-	nS	-	35	-	TJ = 25°C, IF = 28A	t <sub>rr</sub>	Reverse Recovery Time
Reverse Recovery Charge     Qrr     di/dt = 100A/µs <sup>(Note3)</sup> -     58     -	nC	-	58	-	di/dt = 100A/µs <sup>(Note3)</sup>	Qrr	Reverse Recovery Charge
Forward Turn-On Time t <sub>on</sub> Intrinsic turn-on time is negligible (turn-on is dominated by	/LS+LD)	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LE					Forward Turn-On Time

#### Notes:

- 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
- **2.** Surface Mounted on FR4 Board,  $t \le 10$  sec.
- **3.** Pulse Test: Pulse Width  $\leq$  300µs, Duty Cycle  $\leq$  2%.
- 4. Guaranteed by design, not subject to production
- 5. EAS condition: Tj=25 $^\circ\!\!\mathbb{C},V_{DD}$ =50V, $V_G$ =10V,Rg=25 $\Omega$ , L=1mH, I\_{AS}=35A

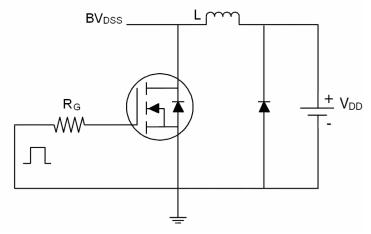


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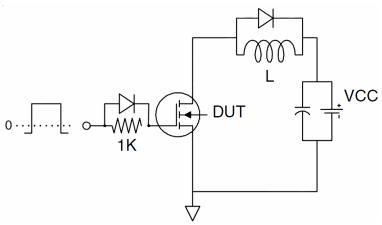




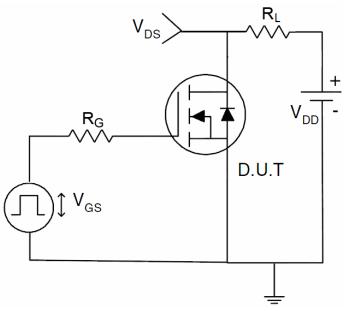
# Test Circuit 1) E<sub>AS</sub> test Circuit



# 2) Gate charge test Circuit



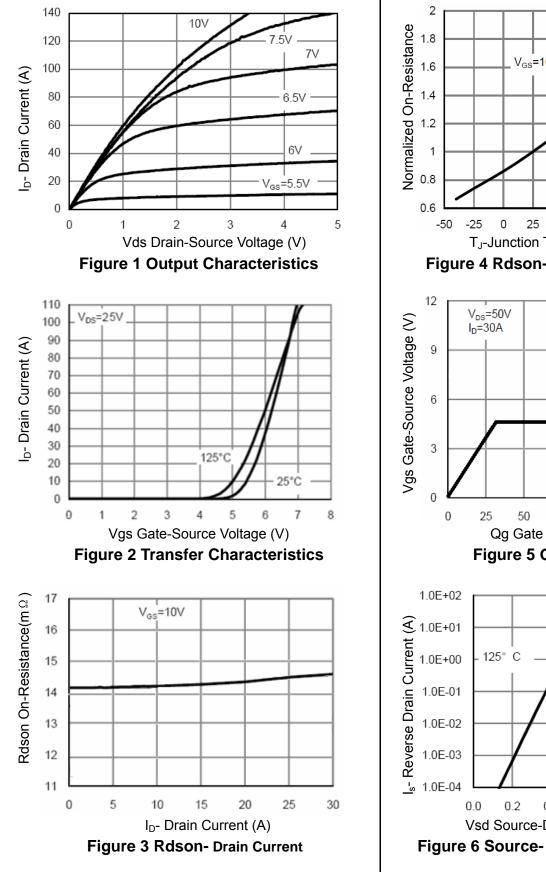
3) Switch Time Test Circuit

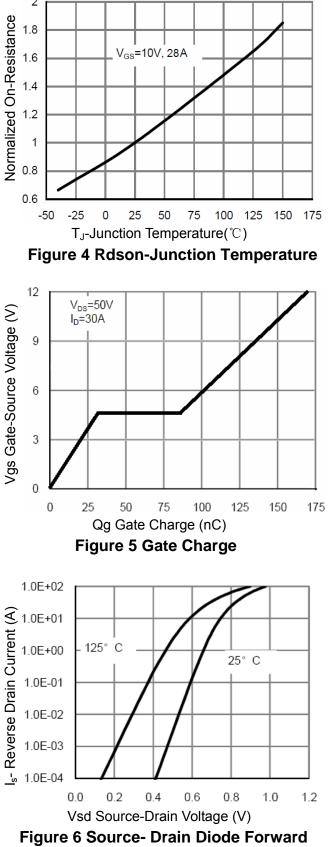






# **Typical Electrical and Thermal Characteristics (Curves)**









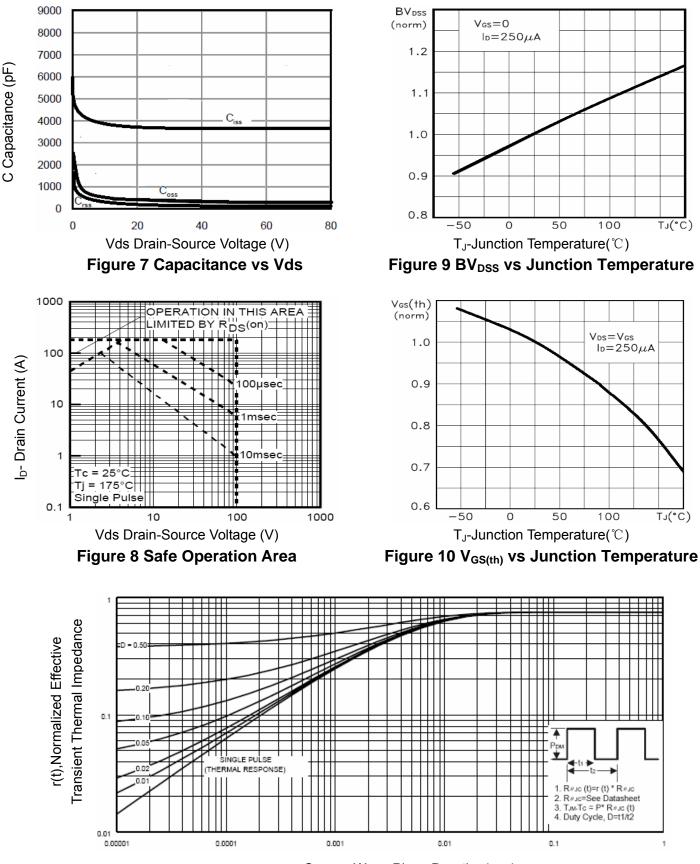
100

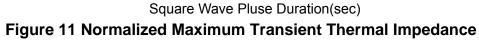
I₀=250µA

100

TJ(°C)

TJ(°C)

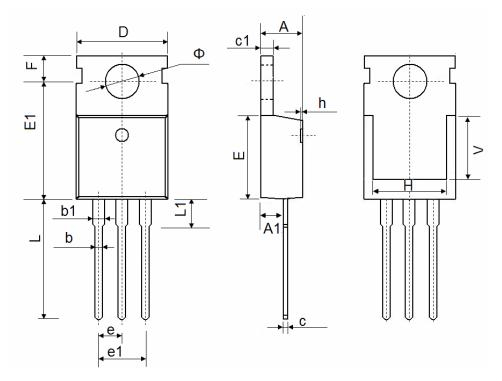








# TO-220-3L Package Information



Symbol	Dimensions	In Millimeters	Dimensions In Inches	
Symbol	Min.	Max.	Min.	Max.
А	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
С	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
е	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
Н	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295	REF.
Φ	3.400	3.800	0.134	0.150







### Attention:

- Any and all NCE power products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your NCE power representative nearest you before using any NCE power products described or contained herein in such applications.
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