

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Advanced trench cell design

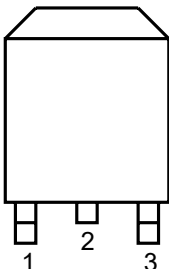
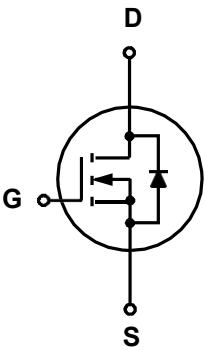
#### 1.2 Applications

- LCD TV appliances
- High power inverter system
- LCDM appliances

#### 1.3 Quick reference

- $BV \geq 60\text{ V}$
- $R_{DS(ON)} \leq 50\text{m}\Omega @ V_{GS} = 10\text{ V}$
- $P_{tot} \leq 35\text{ W}$
- $R_{DS(ON)} \leq 58\text{m}\Omega @ V_{GS} = 4.5\text{ V}$
- $I_D \leq 25\text{ A}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 <p style="text-align: center;">1    2    3</p> <p style="text-align: center;"><b>Top View</b> <b>TO252</b></p>	
2	Drain(D)		
3	Source(S)		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	60	-	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D$	Drain Current ( DC )	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	25	A
		$T_C = 100\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	15	A
$I_{DM}^{*,***}$	Drain Current ( Pulsed )	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	40	A
$P_{tot}$	Drain power dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	35	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S$	Continuous-Source Current	$T_C = 25\text{ }^\circ\text{C}$	-	25	A
$R_{\theta JA}^{**}$	Thermal Resistance- Junction to Ambient		-	50	$^\circ\text{C/W}$
$R_{\theta JC}^{**}$	Thermal Resistance- Junction to Case		-	3.5	

### Notes:

\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

\*\* Mounted on Large Heat Sink

\*\*\* limited by bonding wire

## 4. Marking Information

Product Name	Marking
SN25N06K	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>25N06</b>  <b>YWWXXX</b> </div> <b>YWW:</b> <b>Date Code</b>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
SN25N06K	TO252			2500	

Note: NHCX defines "Green" as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

## 6. Electrical Characteristics ( $T_A=25^\circ$ Unless Otherwise Noted )

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 250\ \mu\text{A}$	60	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$	1.0	-	2.0	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	$\pm 100$	nA
$R_{DS(ON)}^a$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 6\text{ A}$	-	45	50	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_{DS} = 4\text{ A}$	-	50	58	
Diode Characteristics						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 6\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{DS} = 6\text{ A}, V_{GS} = 0\text{ V}$ $di_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	26	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	2.8	-	$\mu\text{C}$
Dynamic Characteristics <sup>b</sup>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 30\text{ V}$ Frequency = 1 MHz	-	651	-	pF
$C_{oss}$	Output Capacitance		-	28	-	
$C_{rss}$	Reverse Transfer Capacitance		-	26	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 30\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 4.5\ \Omega, R_L = 5\ \Omega, I_{DS} = 6\text{ A}$	-	5	-	nS
$t_r$	Turn-on Rise Time		-	21	-	
$t_d(off)$	Turn-off Delay Time		-	15	-	
$t_f$	Turn-off Fall Time		-	23	-	
Gate Charge Characteristics <sup>b</sup>						
$Q_g$	Total Gate Charge	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V},$ $I_{DS} = 6\text{ A}$	-	12	-	nC
$Q_{gs}$	Gate-Source Charge		-	3	-	
$Q_{gd}$	Gate-Drain Charge		-	1.5	-	

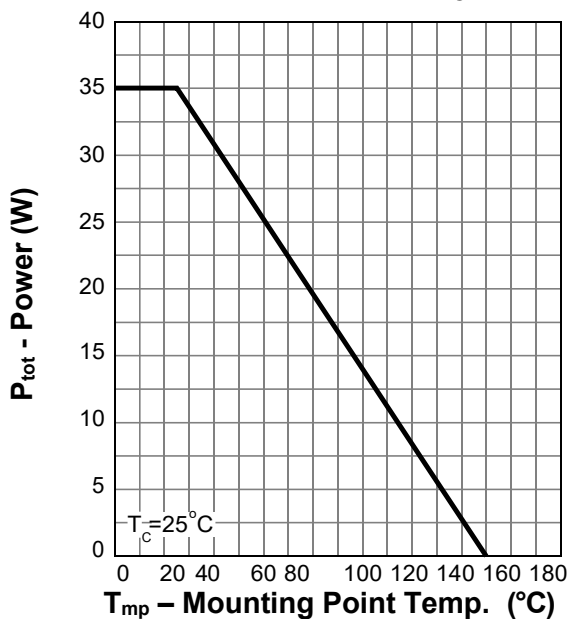
Notes:

a : Pulse test ; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$

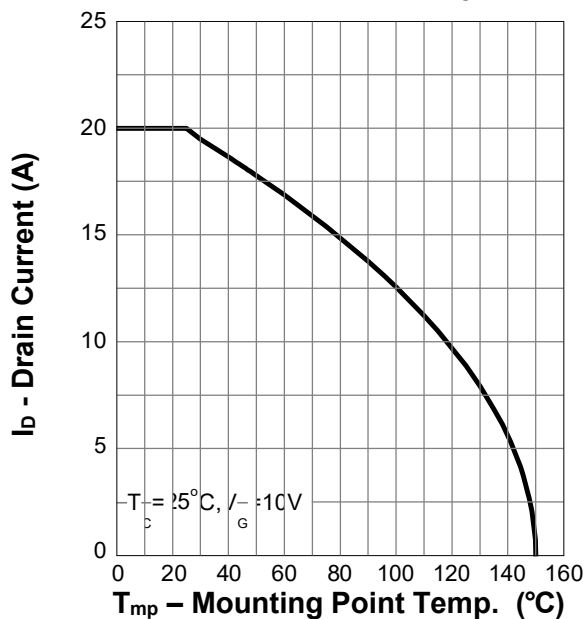
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

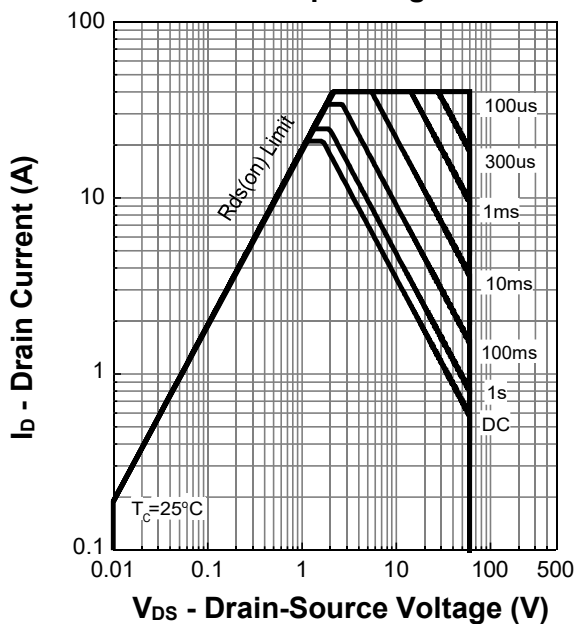
### Power Capability



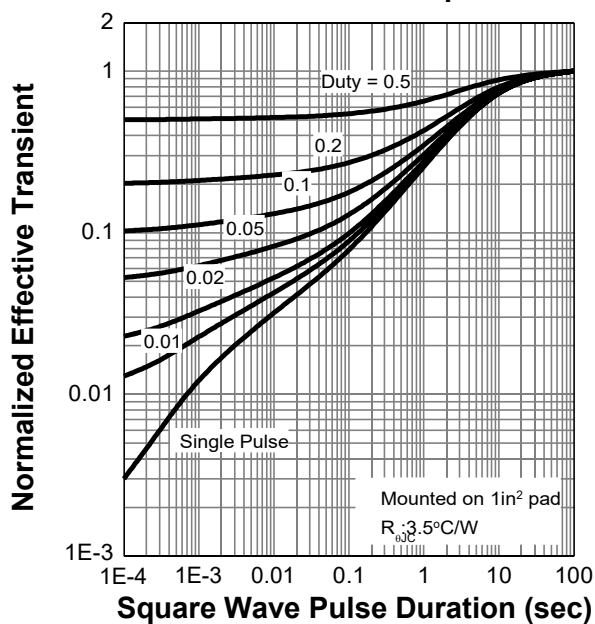
### Current Capability



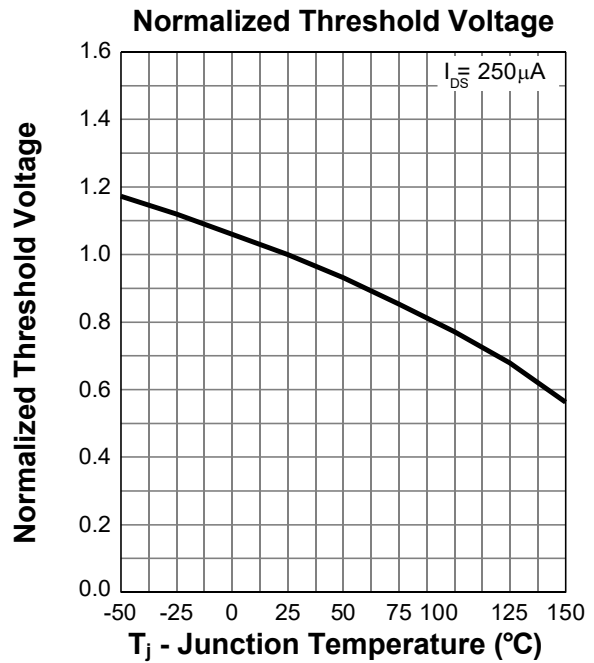
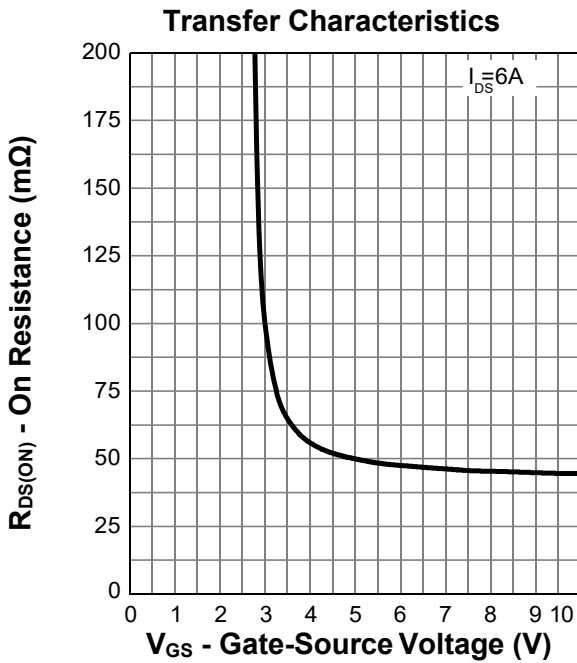
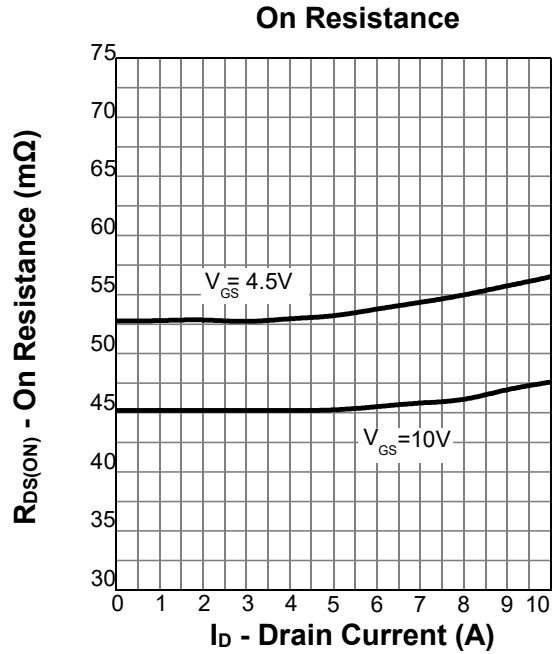
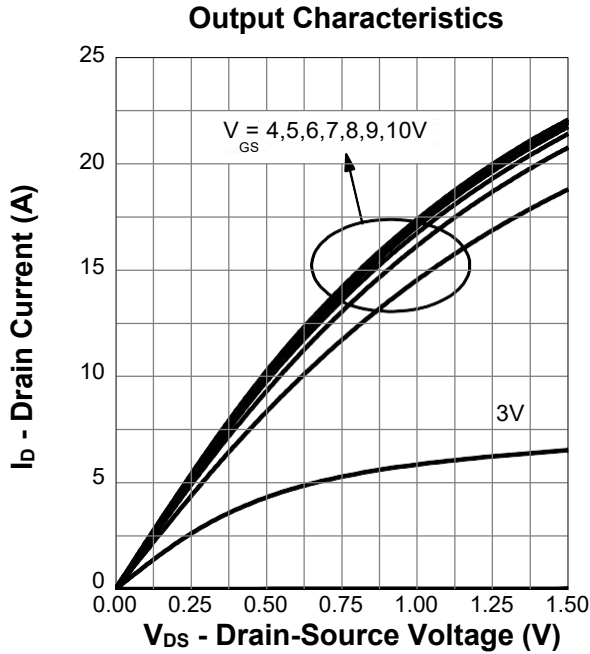
### Safe Operating Area



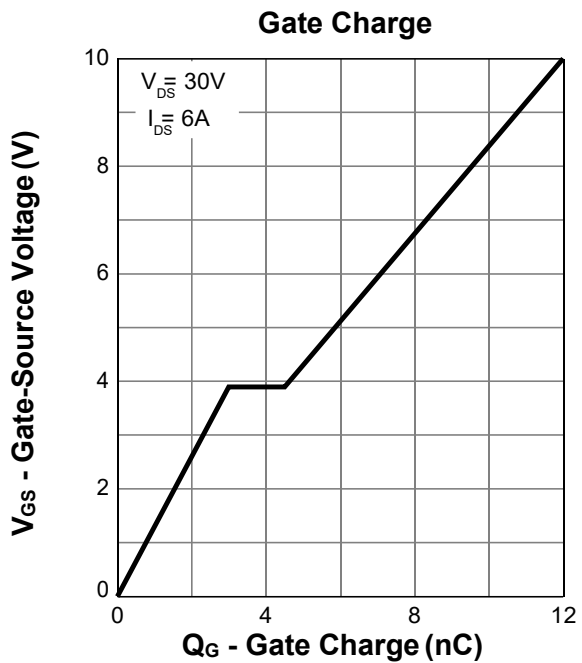
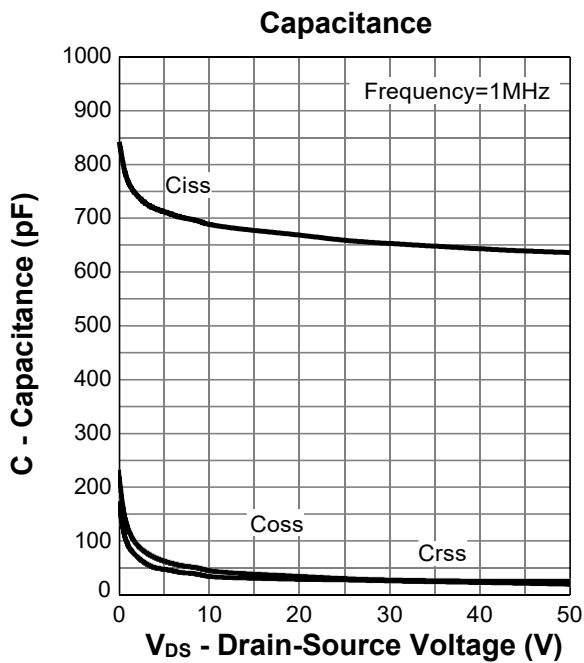
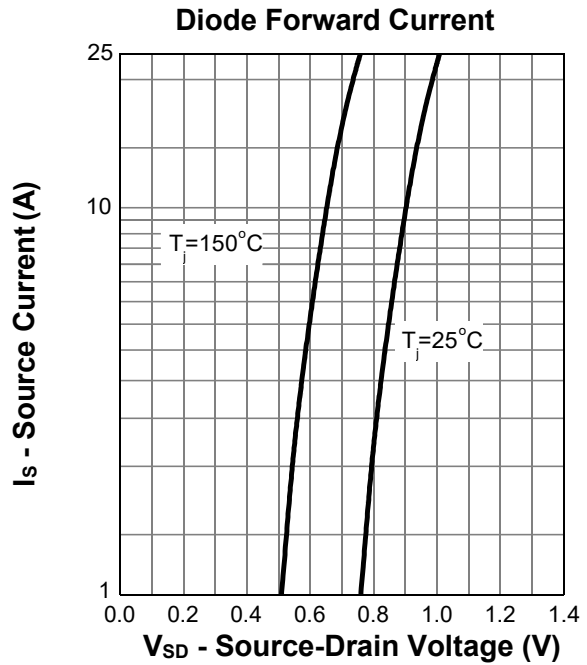
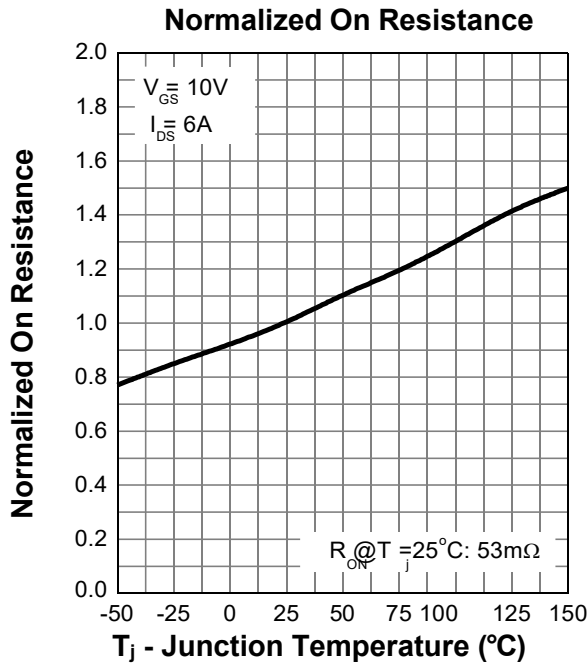
### Transient Thermal Impedance



## 7. Typical Characteristics (cont.)

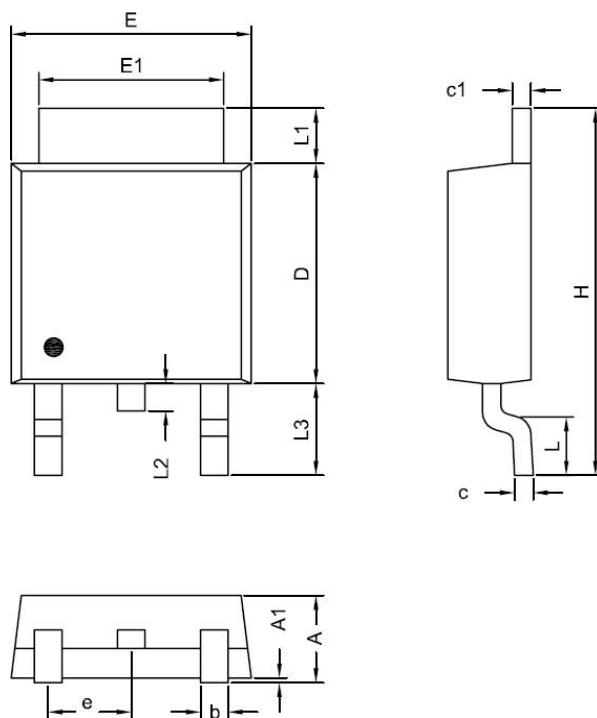


## 7. Typical Characteristics (cont.)



## 8.Package Dimensions

TO252-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
c	0.40	0.60
c1	0.40	0.60
b	0.55	0.85
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40