

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Surface-mounted package
- ☑ Advanced trench cell design

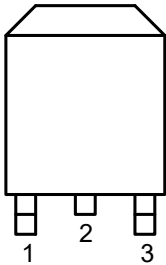
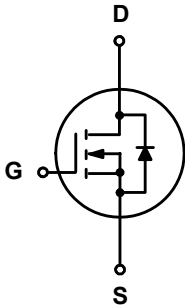
1.2 Applications

- ☑ MB and NB
- ☑ TV and Monitor
- ☑ DC to DC Converter
- ☑ LCD Inverter

1.3 Quick reference

- ☑ $BV \geq 150\text{ V}$
- ☑ $P_{tot} \leq 26\text{ W}$
- ☑ $I_D \leq 6.9\text{ A}$
- ☑ $R_{DS(ON)} \leq 250\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☑ $R_{DS(ON)} \leq 280\text{ m}\Omega @ V_{GS} = 6\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate (G)	 Top View TO-252-3L	
2	Drain (D)		
3	Source (S)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C = 25 °C	-	150	V
V _{GS}	Gate-Source Voltage	T _C = 25 °C	-	±20	V
I _D	Drain Current (DC)	T _C = 25 °C, V _{GS} = 10 V	-	6.9	A
		T _C = 100 °C, V _{GS} = 10 V	-	4.3	A
I _{DM} **	Drain Current (Pulsed)	T _C = 25 °C, V _{GS} = 10 V	-	10	A
P _{tot}	Drain power dissipation	T _C = 25 °C	-	26	W
T _{stg}	Storage Temperature		-55	150	°C
T _J	Junction Temperature		-	150	°C
I _S	Continuous-Source Current	T _C = 25 °C	-	6.9	A
R _{θJA} *	Thermal Resistance- Junction to Ambient		-	58	°C/W
R _{θJC}	Thermal Resistance- Junction to Case		-	4.8	

Notes :

* Surface Mounted on 1 in² pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

*** Limited by bonding wire

4. Marking Information

Product Name	Marking
UP280RN15K	280RN15 YWWXXX YWW: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
UP280RN15K	TO252			2500	

6. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = 250 μA	150	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} = 120 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = 0 V, V _{GS} = ± 20 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} = 10 V, I _{DS} = 3 A	-	217	250	mΩ
		V _{GS} = 6 V, I _{DS} = 2 A	-	248	280	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 3 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} = 3 A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	34	-	nS
Q _{rr}	Reverse Recovery Charge		-	53	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 75 V Frequency = 1 MHz	-	177	-	pF
C _{oss}	Output Capacitance		-	17	-	
C _{rss}	Reverse Transfer Capacitance		-	6	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 75 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 25 Ω, I _{DS} = 3 A	-	4	-	nS
t _r	Turn-on Rise Time		-	3	-	
t _{d(off)}	Turn-off Delay Time		-	7	-	
t _f	Turn-off Fall Time		-	2.6	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 75 V, V _{GS} = 10 V, I _{DS} = 3 A	-	4	-	nC
Q _{gs}	Gate-Source Charge		-	1.5	-	
Q _{gd}	Gate-Drain Charge		-	1	-	

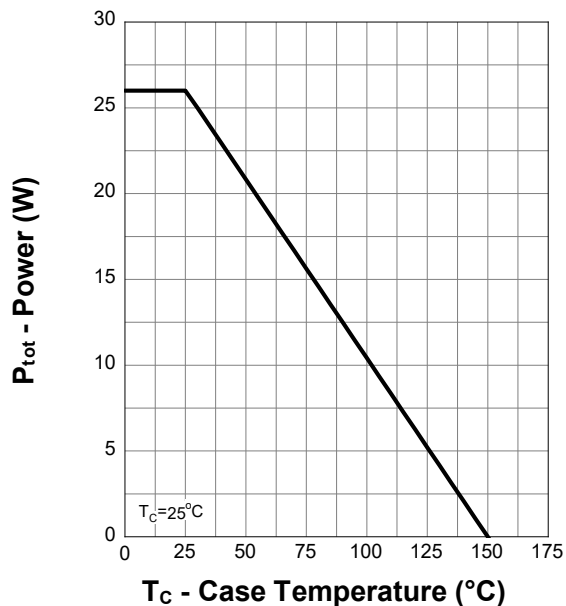
Notes :

a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%

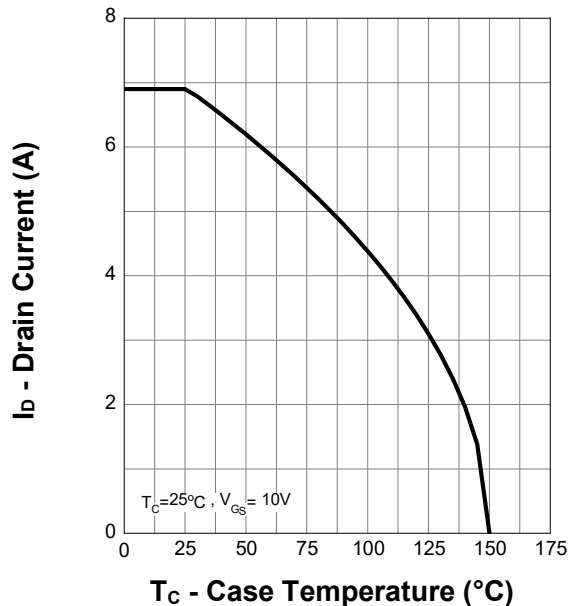
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

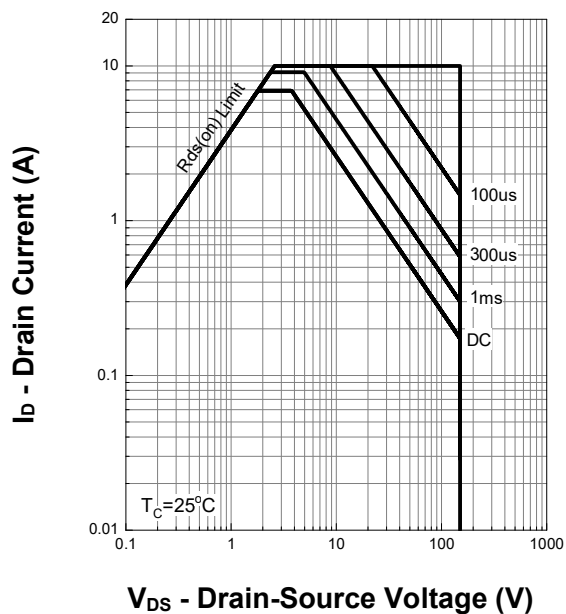
Power Capability



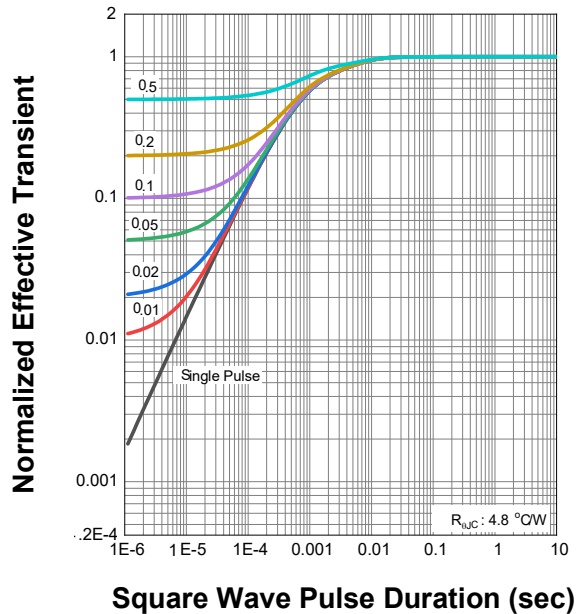
Current Capability



Safe Operating Area

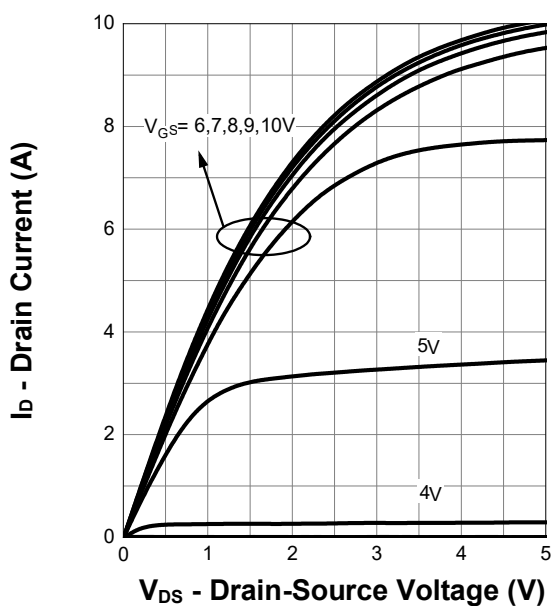


Transient Thermal Impedance

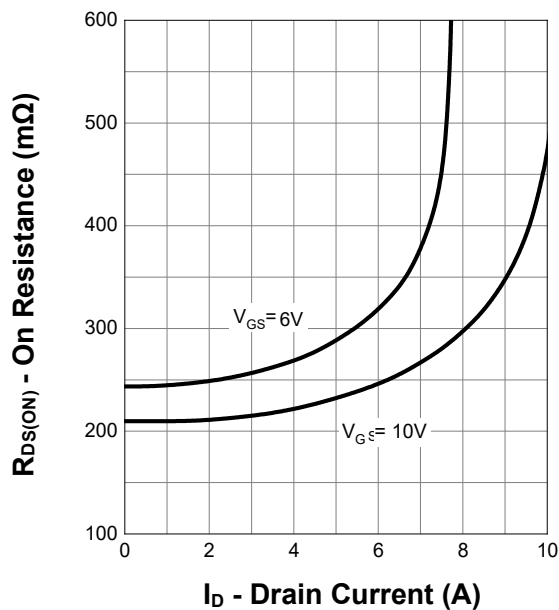


7. Typical Characteristics (cont.)

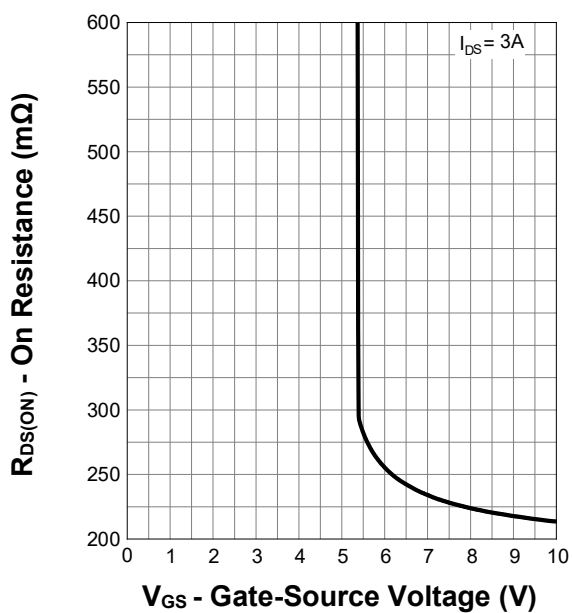
Output Characteristics



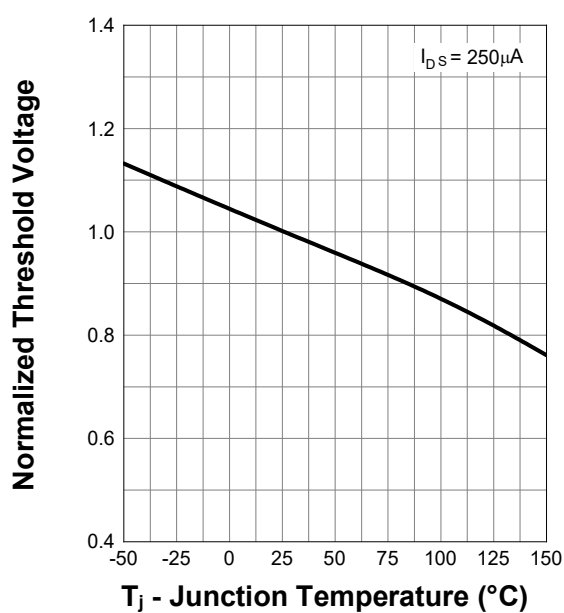
On Resistance



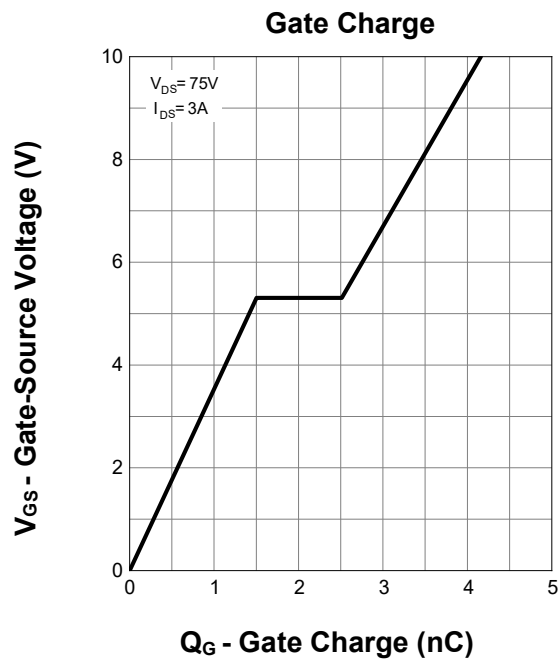
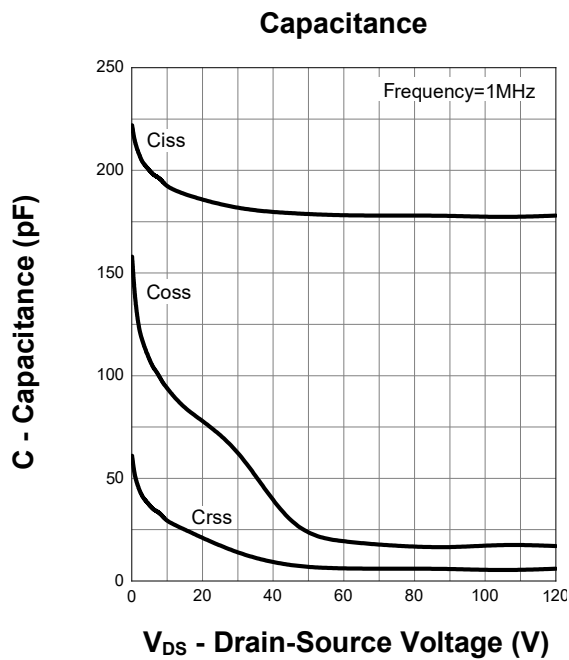
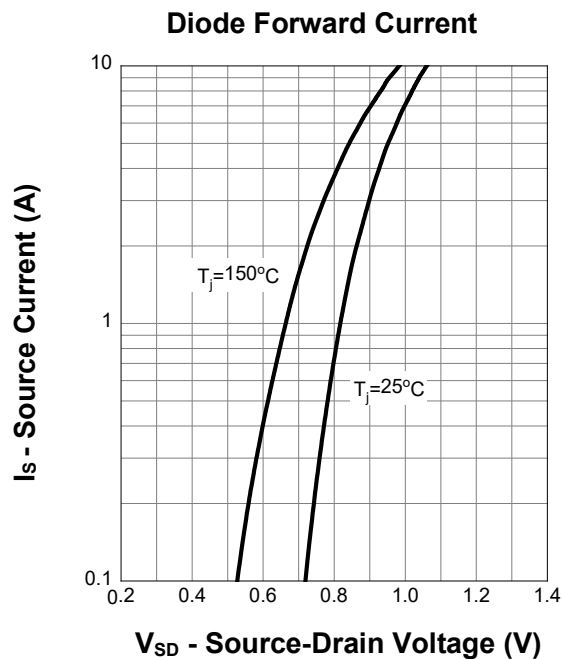
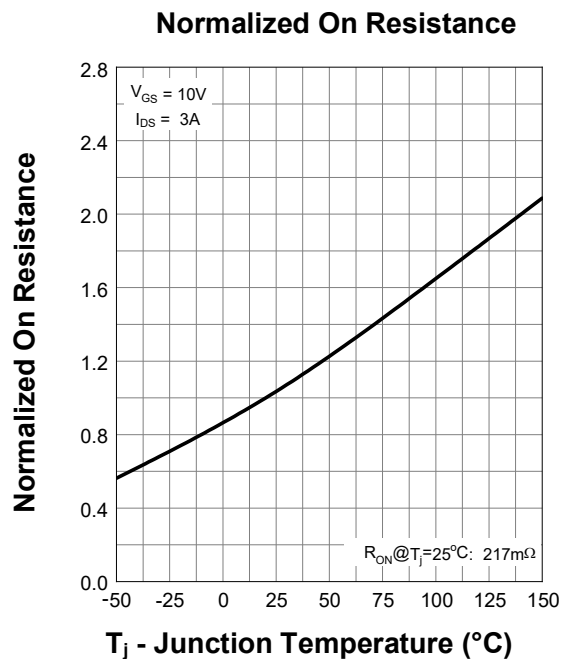
Transfer Characteristics



Normalized Threshold Voltage

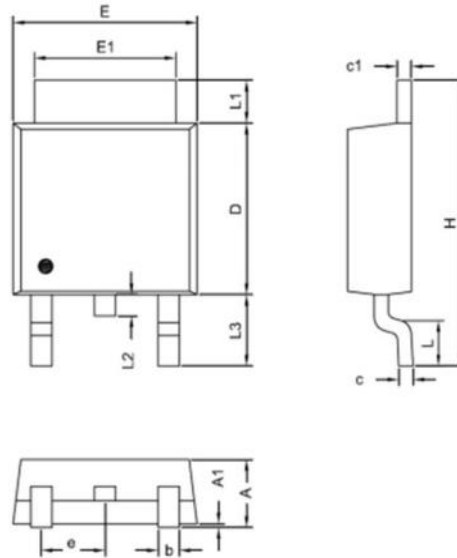


7. Typical Characteristics (cont.)



8.Package Dimensions

TO-252-3L



SYMBOL	Unit : mm		Unit : inch	
	MIN	MAX	MIN	MAX
A	2.080	2.500	0.082	0.098
A1	0.000	0.250	0.000	0.010
D	5.600	6.400	0.220	0.252
E	6.100	6.850	0.240	0.270
E1	4.676	5.650	0.184	0.222
c	0.400	0.650	0.016	0.026
c1	0.400	0.650	0.016	0.026
b	0.500	1.050	0.020	0.041
e	2.090	2.500	0.082	0.098
L	1.300	1.900	0.051	0.075
L1	0.850	1.212	0.033	0.048
L2	0.500	1.200	0.020	0.047
L3	2.600	3.200	0.102	0.126
H	9.000	10.700	0.354	0.421

Note : Dimension D and E do not include mold flash or protrusions.
Mold flash or protrusions shall not exceed 0.25mm(10 mils).