

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Advanced trench cell design
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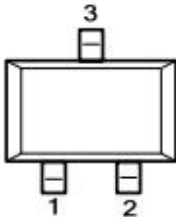
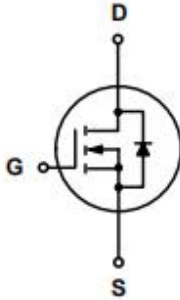
1.2 Applications

- ☒ Motor appliances
- ☒ Battery management
- ☒ Low power DC to DC Converter

1.3 Quick reference

- ☒ $BV \geq 30\text{ V}$
- ☒ $P_{tot} \leq 0.83\text{ W}$
- ☒ $I_D \leq 4.3\text{ A}$
- ☒ $R_{DS(ON)} \leq 30\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☒ $R_{DS(ON)} \leq 48\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View SOT23-3L	
2	Source(S)		
3	Drain(D)		

SN3400

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	30	-	V
V_{GS}	Gate-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	4.3	A
		$T_A = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	2.7	A
I_{DM}^{***}	Pulsed Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	17.2	A
P_{tot}	Total Power Dissipation	$T_A = 25\text{ }^{\circ}\text{C}$	-	0.83	W
T_{stg}	Storage Temperature		- 55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		- 55	150	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_A = 25\text{ }^{\circ}\text{C}$	-	4.3	A
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	150	$^{\circ}\text{C} / \text{W}$

Notes :

- * Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$
- ** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

4. Marking Information

Product Name	Marking
SN3400	X : Date Code

5. Ordering Code

SN3400 □ I----- Assembly Material	Assembly Material G: Halogen and Lead Free Device
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6. Electrical Characteristics ($T_A=25\text{ }^{\circ}\text{C}$ 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	30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1	1.5	2	V
I _{DSS}	Drain Leakage Current	V _{DS} = 24 V, V _{GS} = 0 V	-	-	1	μA
		T _J = 55 °C	-	-	5	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ±20 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} = 10 V, I _{DS} = 4 A	-	24	30	mΩ
		V _{GS} = 4.5 V, I _{DS} = 3 A	-	37	48	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 1 A, V _{GS} = 0V	-	-	1.2	V
t _r	Reverse Recovery Time	I _{SD} = 4 A, dI _{SD} /dt = 100 A/μs	-	19	-	ns
Q _{rr}	Reverse Recovery Charge		-	1.04	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 15 V Frequency = 1 MHz	-	572	-	pF
C _{oss}	Output Capacitance		-	81	-	
C _{rss}	Reverse Transfer Capacitance		-	65	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 15 V, V _{GEN} = 10 V, R _G = 3.3 Ω, R _L = 3.75 Ω, I _{DS} = 4 A	-	2.4	-	ns
t _r	Turn-on Rise Time		-	7.8	-	
t _{d(off)}	Turn-off Delay Time		-	22	-	
t _f	Turn-off Fall Time		-	4	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{GS} = 10 V, V _{DS} = 15 V, I _{DS} = 4 A	-	12	-	nC
Q _{gs}	Gate-Source Charge		-	2.5	-	
Q _{gd}	Gate-Drain Charge		-	2.1	-	

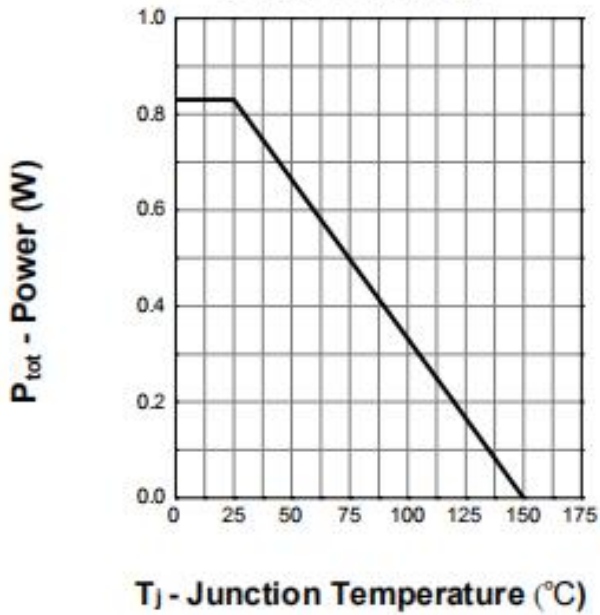
Notes :

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

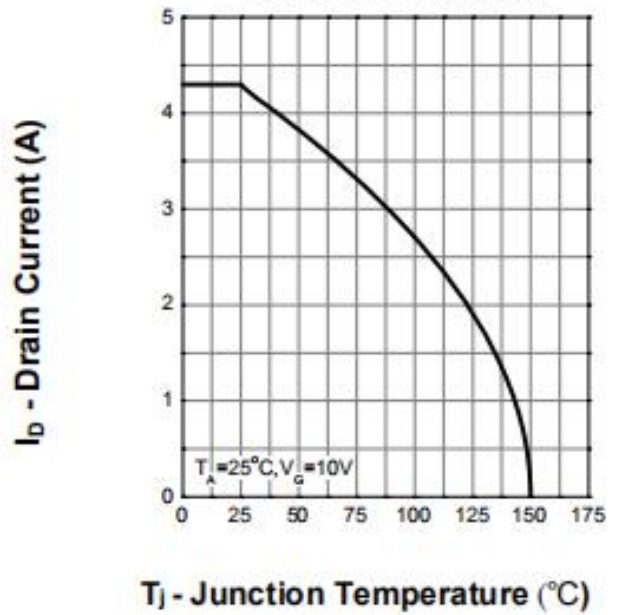
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

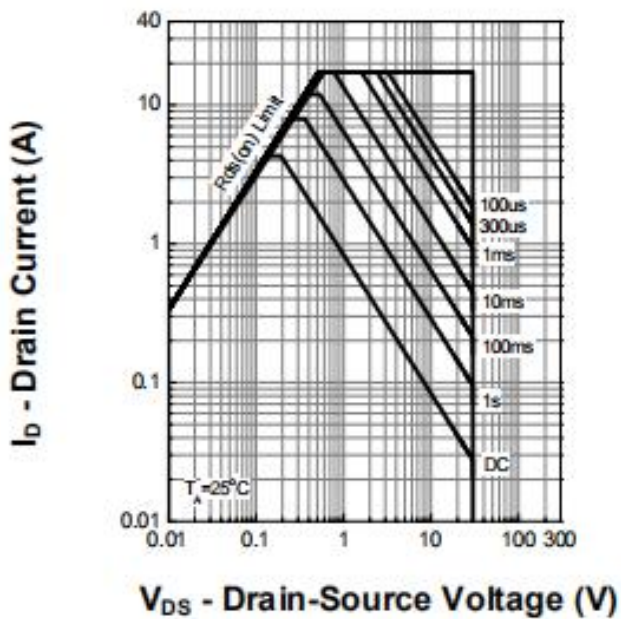
Power Capability



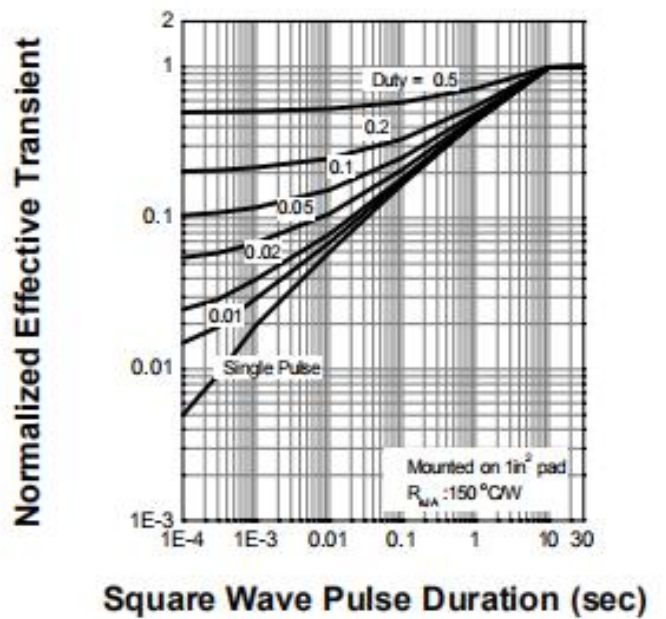
Current Capability



Safe Operation Area

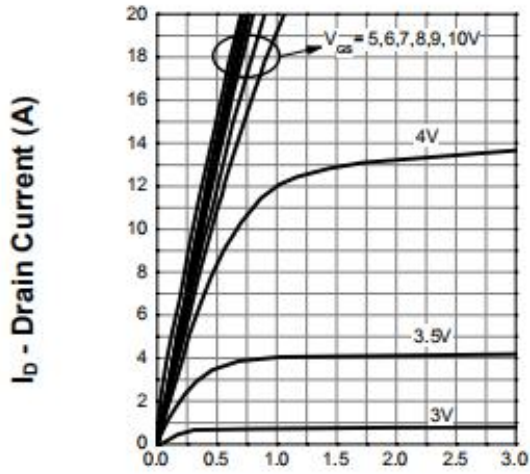


Transient Thermal Impedance



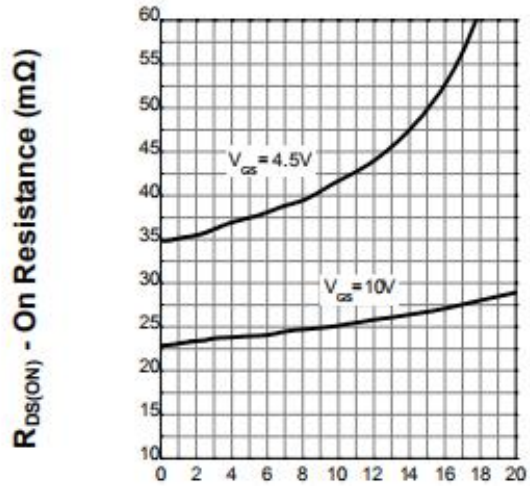
7. Typical Characteristics (cont.)

Output Characteristics



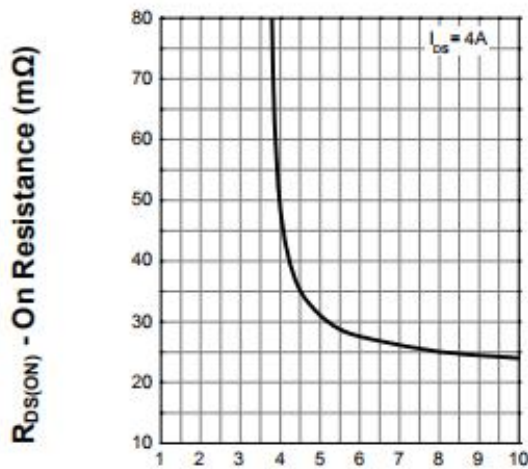
V_{DS} - Drain-Source Voltage (V)

On Resistance



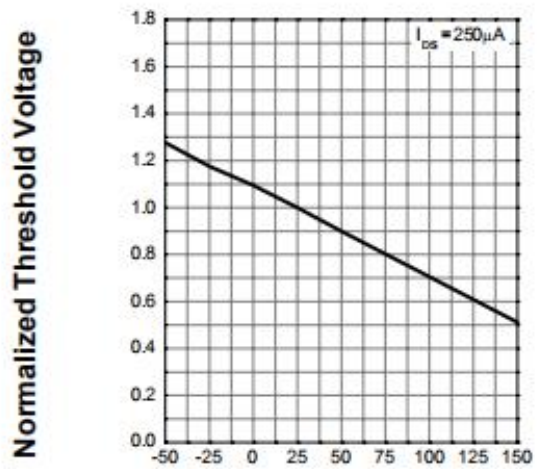
I_D - Drain Current (A)

Transfer Characteristics



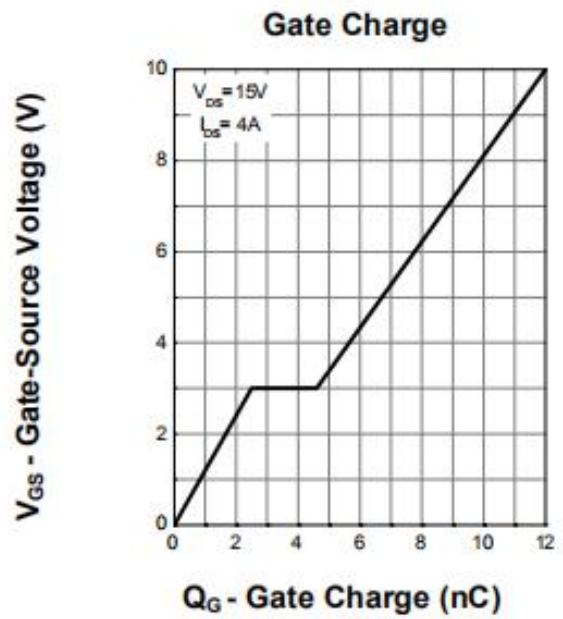
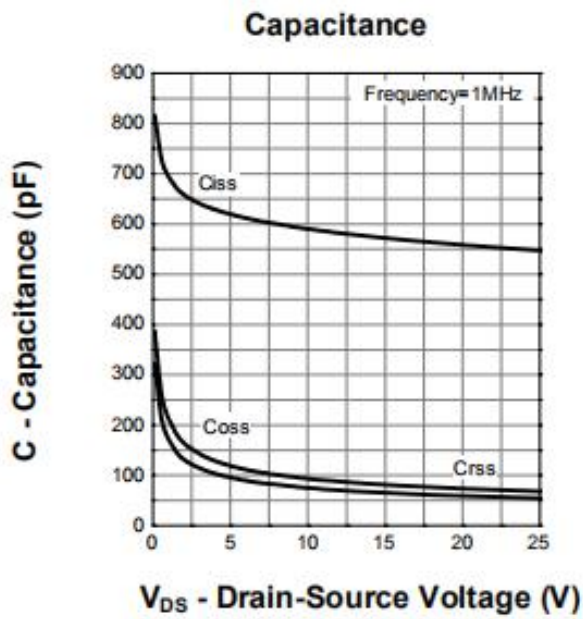
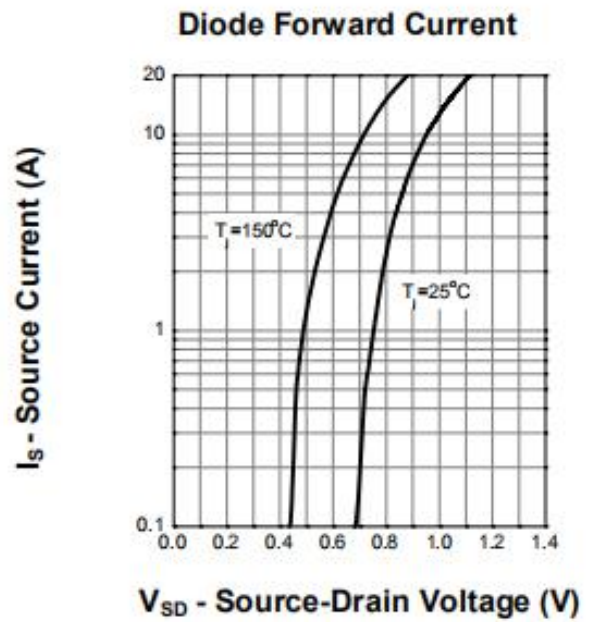
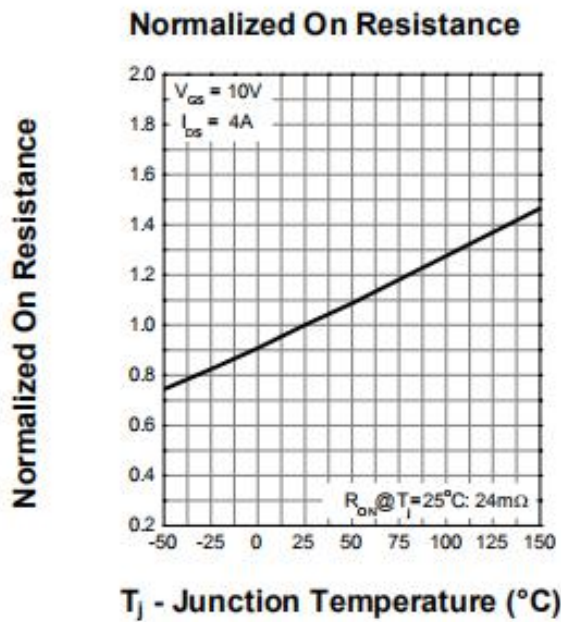
V_{GS} - Gate-Source Voltage (V)

Normalized Threshold Voltage

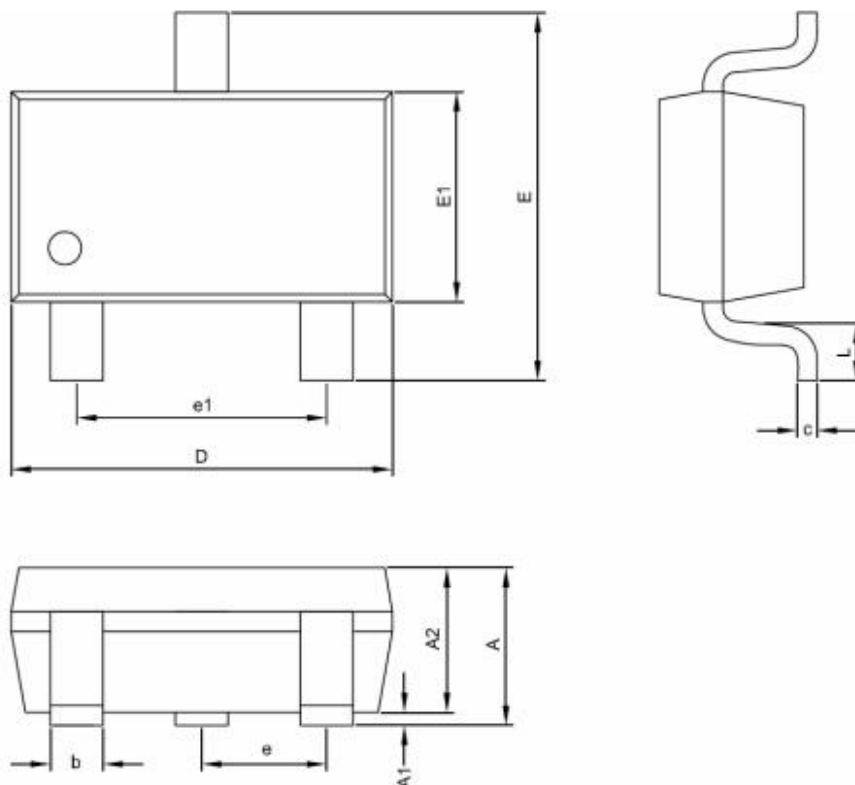


T_J - Junction Temperature ($^{\circ}C$)

7. Typical Characteristics (cont.)



8. Package Dimensions SOT23-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.00	1.45
A1	0.00	0.15
A2	1.00	1.30
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
c	0.08	0.25
b	0.30	0.50
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60