N-Channel Enhancement Mode MOSFET

1 Features

- V_{DS} = 20V, I_D =6A
- $R_{DS(ON)}$ < 28mΩ @ V_{GS}=4.5V
- $R_{DS(ON)}$ < 38mΩ @ V_{GS}=2.5V
- $R_{DS(ON)}$ < 60mΩ @ V_{GS}=1.8V
- High density cell design for extremely low $R_{DS(ON)}$
- Lead free product is acquired
- Conventional SOT-23 Package

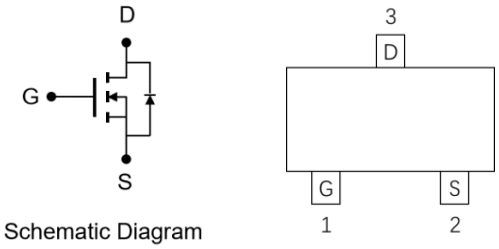
2 Applications

- Cellular Handsets and Accessories
- PWM applications
- Load switch
- Power management

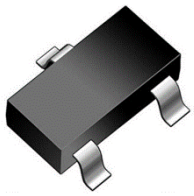
3 Description

The SLMT320V6CN provide the best combination of fast switching, low on-resistance and cost-effectiveness. The MOSFET is the N-Channel enhancement mode power field effect transistors with high cell density, trench technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

4 Pin Configuration and Top View



Schematic Diagram



5 Device Information

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SLMT320V6CN	SOT-23	2.90 mm x 2.40mm

6 Absolute maximum Ratings @25℃

RATING	SYMBOL	VALUE	UNITS
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	6	A
Pulsed Drain Current	I_{DP}	25	A
Total power dissipation	P_D	1	W
Channel temperature	T_J	-55 to +150	℃
Range of storage temperature	T_{STG}	-55 to +150	℃
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	90	℃/W

7 Electrical characteristics (@25℃ unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250μA, V_{GS} = 0V	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.6		1.0	V
Drain Cut Off Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V			1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0V			0.1	μA
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 6.0A		21	28	mΩ
		V_{GS} = 2.5V, I_D= 5.2A		28	38	mΩ
		V_{GS} = 1.8V, I_D= 3.0A		50	60	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 10V, I_D = 6.0A		5		S
Dynamic Characteristics						
Total Gate Charge	Q_G	V_{DS} =10V,		7.7		nC
Gate-Source Charge	Q_{GS}	I_D =6.0A,		3.2		nC
Gate-Drain Charge	Q_{GD}	V_{GS} = 4.5V		2.1		nC
Input Capacitance	C_{ISS}	V_{DS} = 15V,		574		pF
Reverse Transfer Capacitance	C_{RSS}	V_{GS} = 0V,		60		pF
Output Capacitance	C_{OSS}	f = 1MHz		70		pF
Turn-On Delay Time	$t_{d(on)}$	V_{GS} =4.5V, V_{DS} =10V , I_D =1.0A R_G =6.0Ω		78.7		ns
Turn-Off Delay Time	$t_{d(off)}$			453		ns
Rise Time	t_r			128		ns
Fall Time	t_f			80.9		ns
Gate Resistance	R_g	f=1 MHz				Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1.7A, V_{GS} = 0V		0.8	1.2	V

8 Typical Characteristics

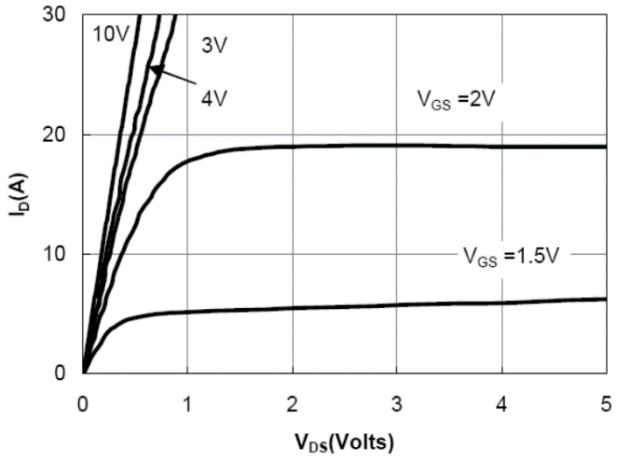


Figure 1: On-Regions Characteristics

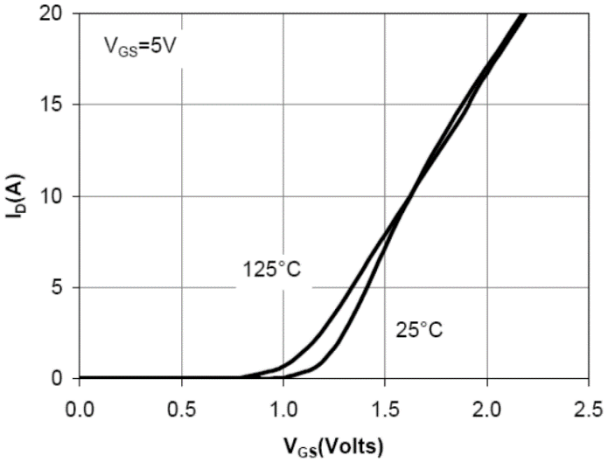


Figure 2: Transfer Characteristics

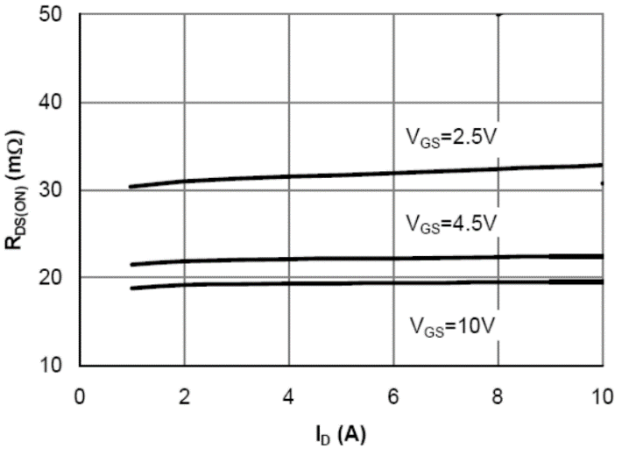


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

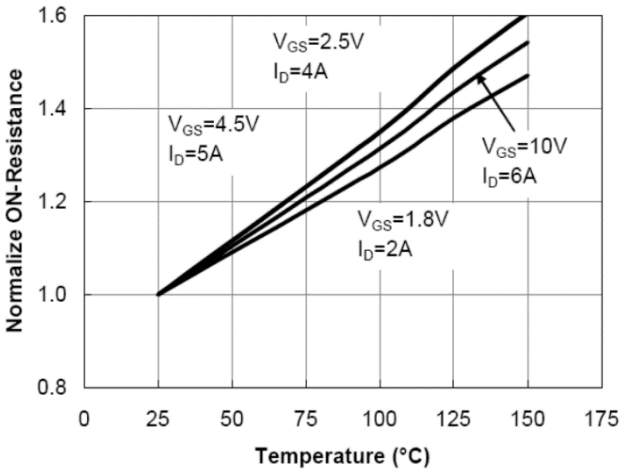


Figure 4: On-Resistance vs. Junction Temperature

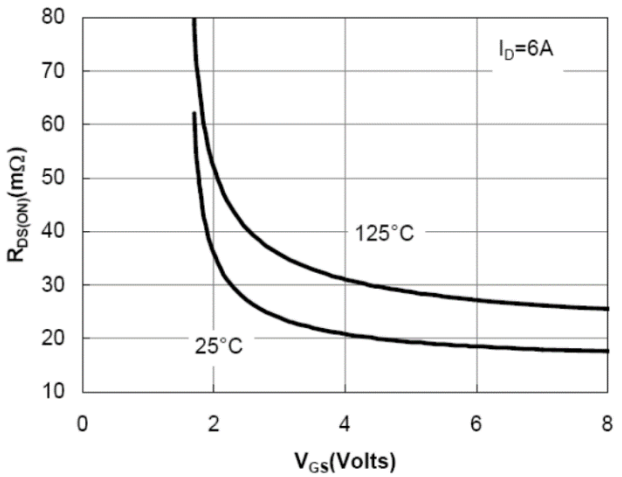


Figure 5: On-Resistance vs. Gate-Source Voltage

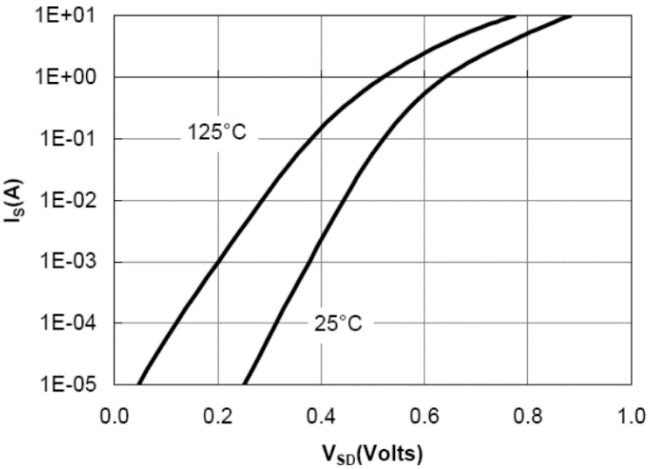


Figure 6: Body-Diode Characteristics

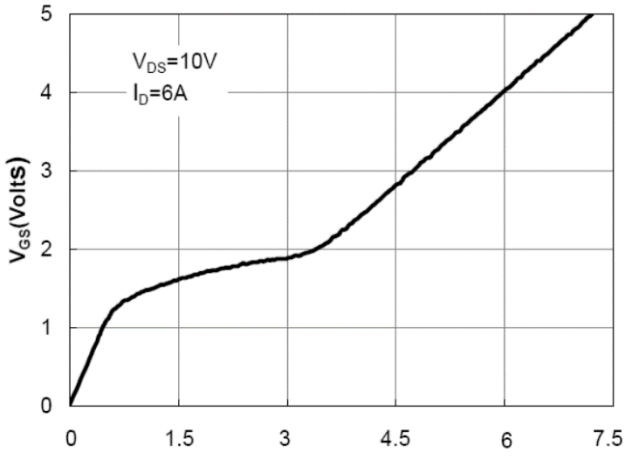


Figure 7: Gate-Charge Characteristics

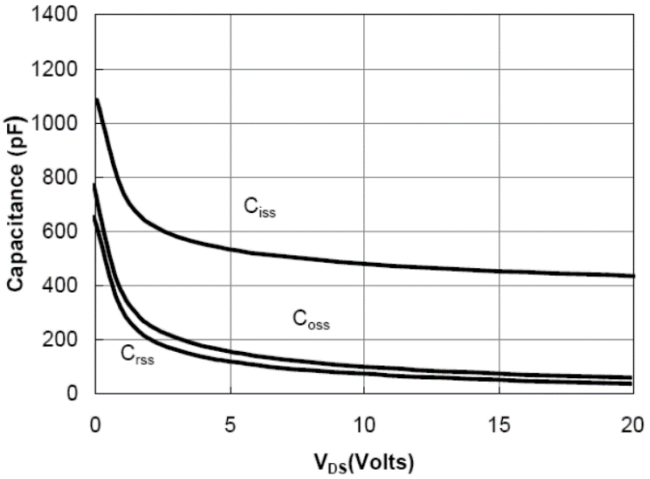


Figure 8: Capacitance Characteristics

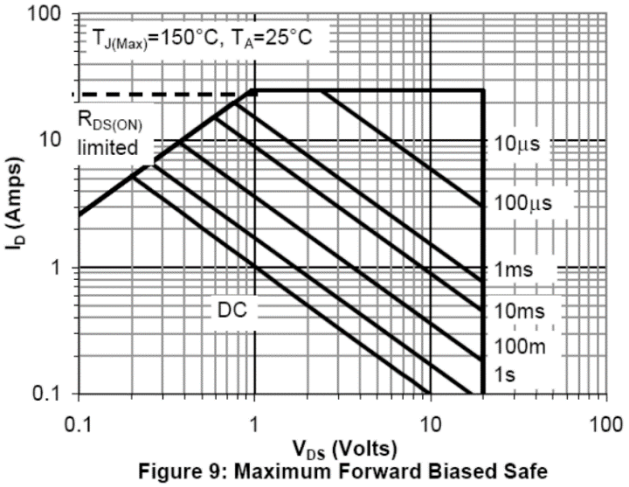


Figure 9: Maximum Forward Biased Safe Operating Area

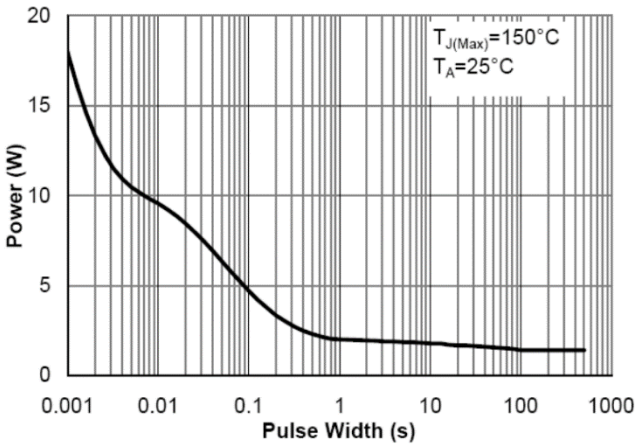


Figure 10: Single Pulse Power Rating Junction-to-Ambient

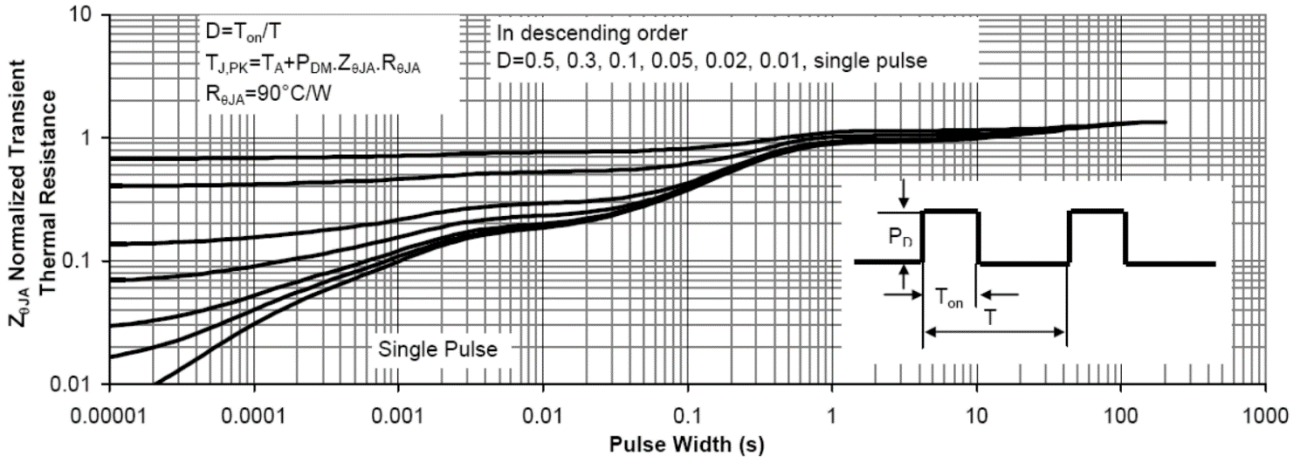
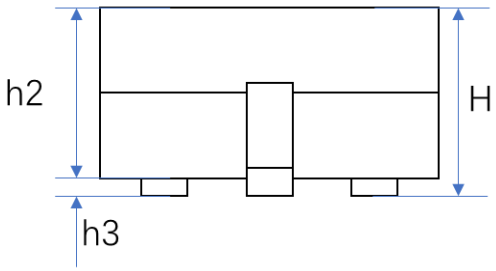
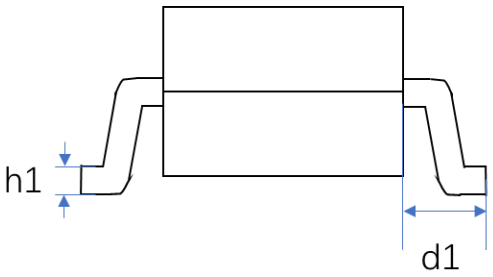


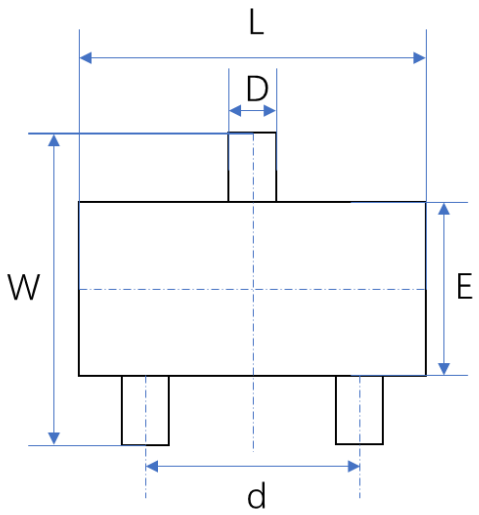
Figure 11: Normalized Maximum Transient Thermal Impedance

9 Product dimension

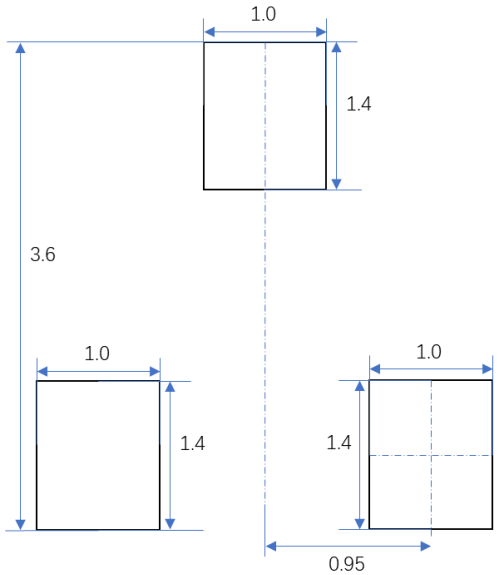




DIM	UNITS (mm)		
	MIN.	TYP.	MAX.
L	2.80	-	3.00
W	2.25	-	2.55
D	0.30	-	0.50
E	1.20	-	1.40
d	1.80	-	2.00
d1	-	0.55	-
H	0.90	-	1.15
h1	0.08	-	0.15
h2	0.9	-	1.05
h3	0.00	-	0.10



10 PCB Layout Footprints (Units: mm)



11 Ordering Information

Part Number	Packaging	Reel Size
SLMT320V6CN	3000/Tape & Reel	7 inch