N-Channel Enhancement Mode MOSFET

1 Features

- V_{DS} = 20V, I_D =0.75A
- $R_{DS(ON)}$ ＜ 360mΩ @ V_{GS}= 4.5V
- $R_{DS(ON)}$ ＜ 520mΩ @ V_{GS}= 2.5V
- $R_{DS(ON)}$ ＜ 860mΩ @ V_{GS}= 1.8V
- High Power and current handing capability
- ESD Protected Up to 2.0KV (HBM)
- Package SOT-323

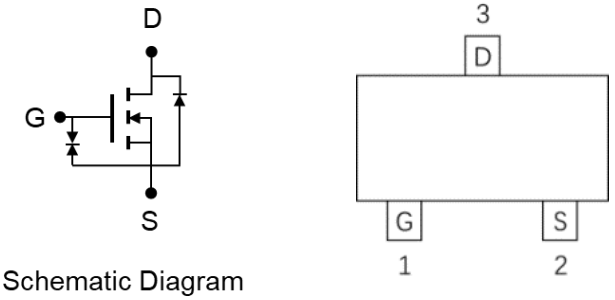
2 Applications

- PWM applications
- Load switch
- Power management

3 Description

The SLMT220V1CNK provide the best combination of fast switching, low on-resistance and cost effectiveness. The MOSFET uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 0.75V. This device is suitable for use as a load switch or in PWM applications.

4 Pin Configuration and Top View



Schematic Diagram

SOT-323

5 Device Information

PART NUMBER	PACKAGE	BODY SIZE
SLMT220V1CNK	SOT-323	2.20 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}	±10	V
Continuous Drain Current	I_D	0.75	A
Pulsed Drain Current	I_{DP}	4	A
Total power dissipation	P_D	250	mW
Channel temperature	T_J	150	℃
Range of storage temperature	T_{STG}	-55 to +150	℃
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	500	℃/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	0.35	0.75	1.1	V
Drain Cut Off Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V			1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±8V, V_{DS} = 0V			±10	μA
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 0.7A		200	360	mΩ
		V_{GS} = 2.5V, I_D= 0.5A		290	520	mΩ
		V_{GS} = 1.8V, I_D= 0.2A		480	860	mΩ
Dynamic Characteristics						
Total Gate Charge	Q_G	V_{DS} =4.5V,		1.0		nC
Gate-Source Charge	Q_{GS}	I_D =0.75A,		0.28		nC
Gate-Drain Charge	Q_{GD}	V_{GS} = 10V		0.22		nC
Input Capacitance	C_{ISS}	V_{DS} = 10V,		56		pF
Reverse Transfer Capacitance	C_{RSS}	V_{GS} = 0V,		2.5		pF
Output Capacitance	C_{OSS}	f = 1.0MHz		20		pF
Turn-On Delay Time	$t_{d(on)}$	V_{GS} =4.5V, V_{DS} =10V I_D=0.75A, R_{GEN} =10Ω		2		ns
Turn-Off Delay Time	$t_{d(off)}$			10		ns
Rise Time	t_r			18.8		ns
Fall Time	t_f			23		ns
Gate Resistance	R_g	f=1 MHz		50		Ω
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 0.75A, V_{GS} = 0V		0.9	1.2	V

8 Typical Characteristics

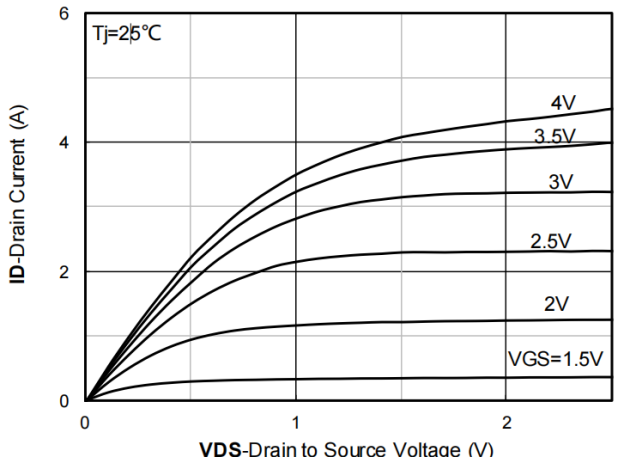


Fig 1：Output Characteristics

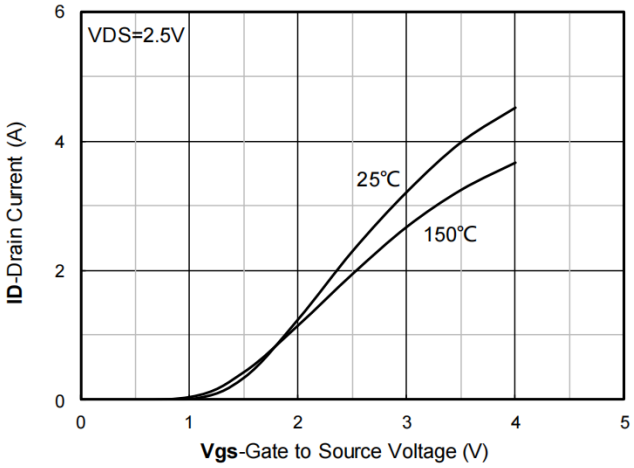


Fig 2：Transfer Characteristics

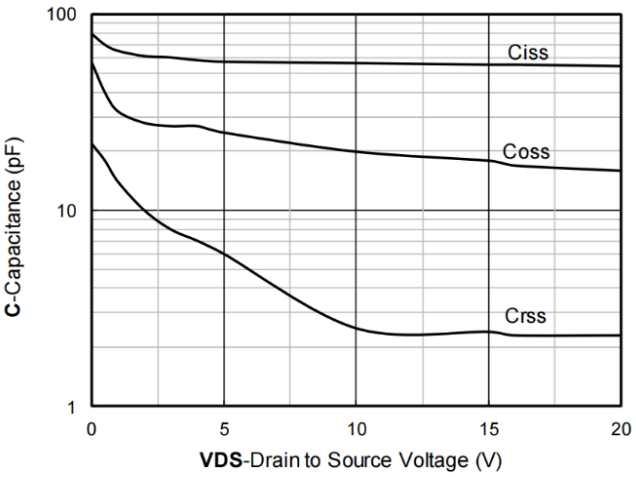


Fig 3：Capacitance Characteristics

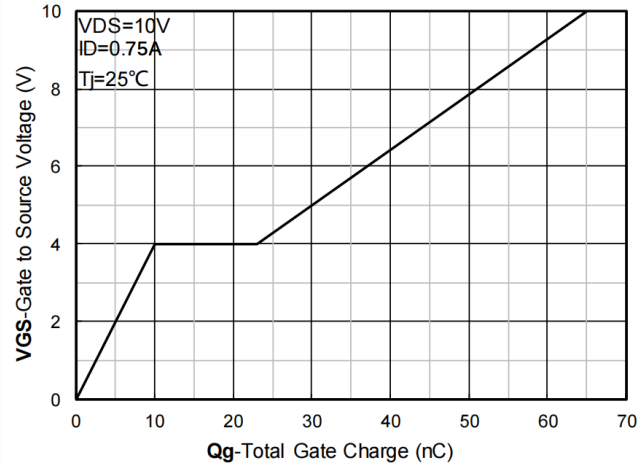


Fig 4：Gate Charge

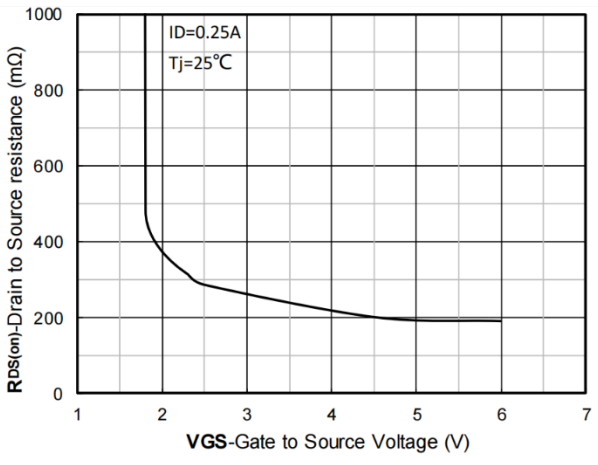


Fig 5：On-Resistance vs Gate to Source Voltage

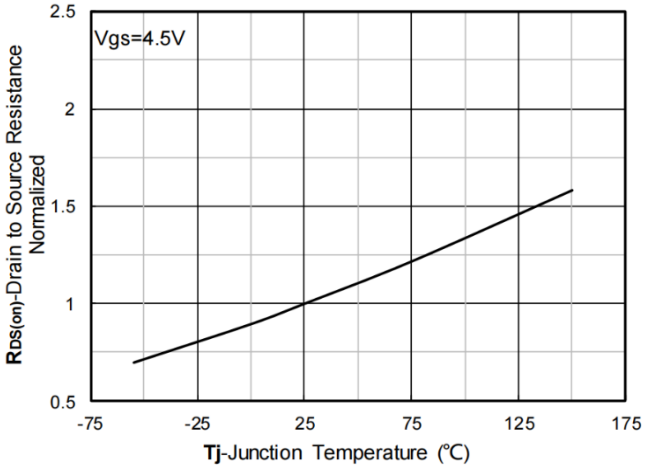


Fig 6：Normalized On-Resistance

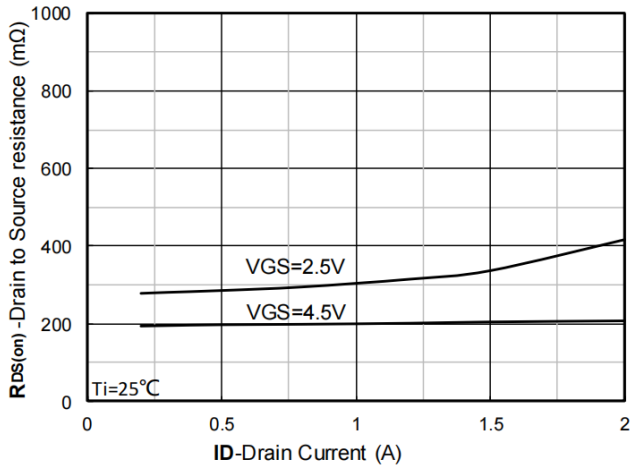


Fig 7：RDS(on) VS Drain Current

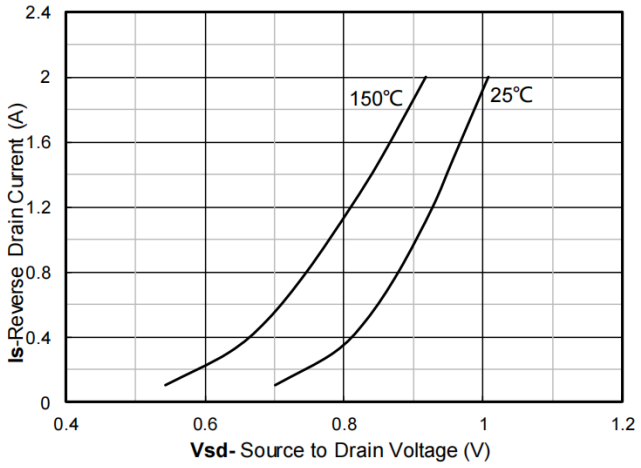


Fig 8：Forward characteristics of reverse diode

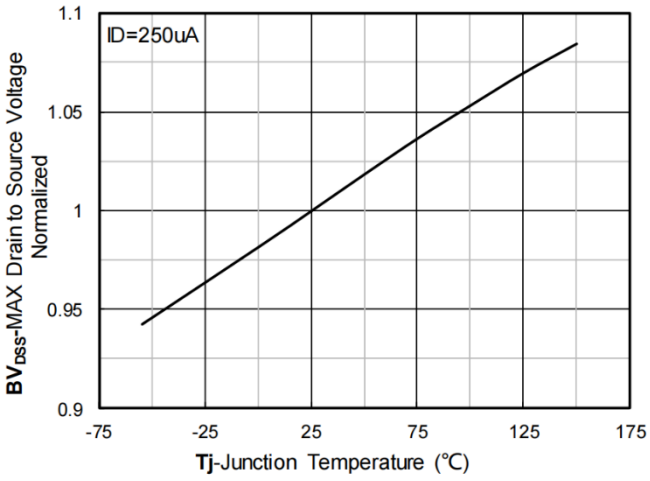


Fig 9：Normalized breakdown voltage

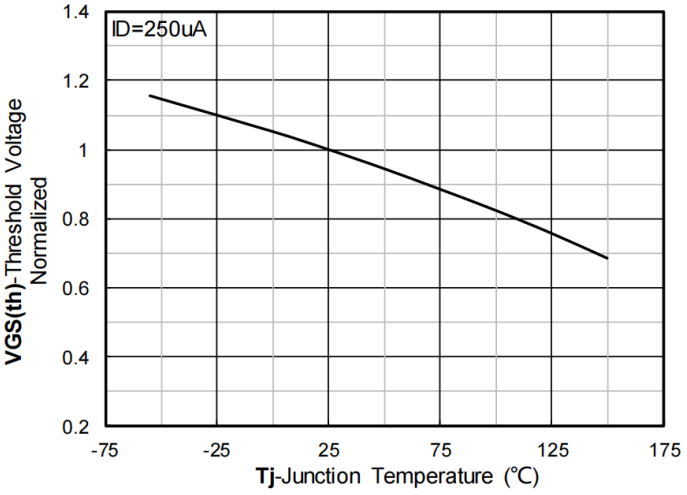


Fig 10：Normalized Threshold voltage

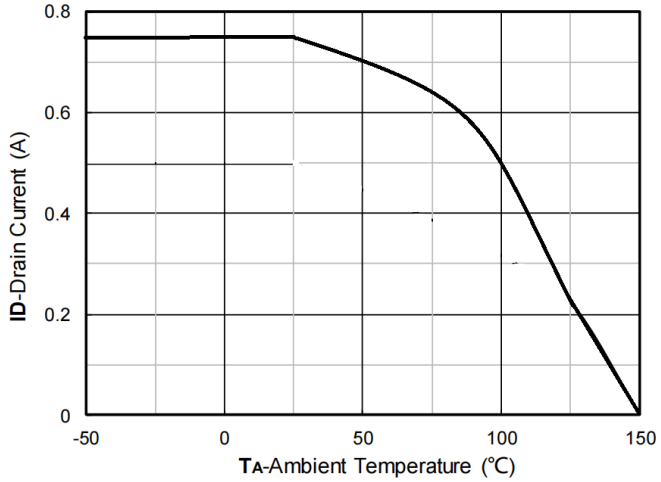


Fig 11：Current dissipation

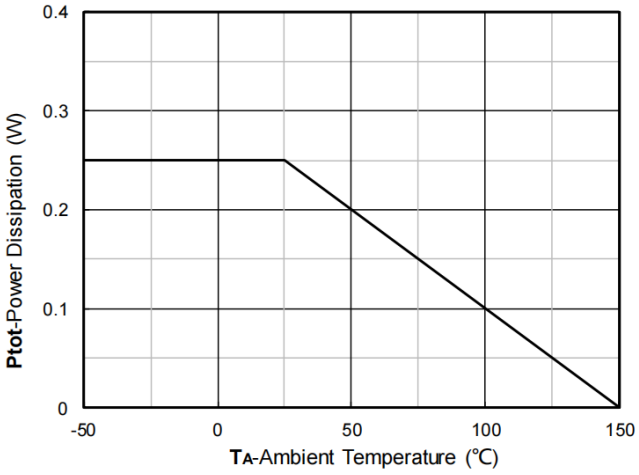
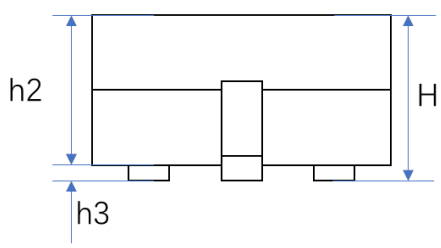
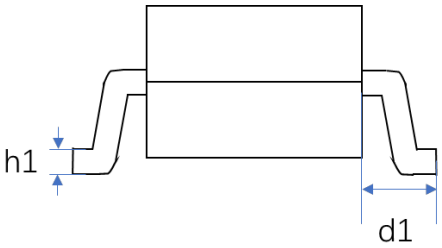


Fig 12：Power dissipation

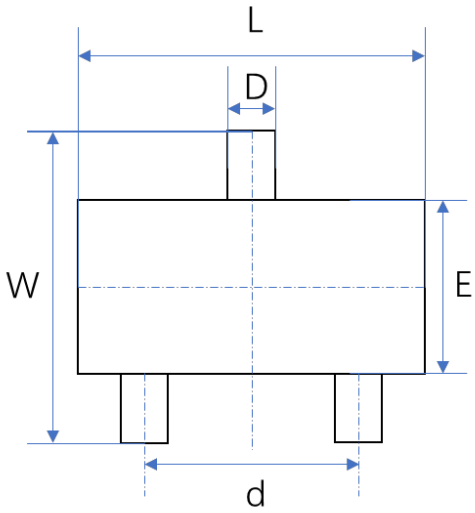
9 Product dimension

SOT-323





DIM	UNITS (mm)		
	MIN.	TYP.	MAX.
L	2.00	2.10	2.20
W	2.15	2.27	2.40
D	0.20	0.30	0.40
E	1.15	1.25	1.35
d	1.20	1.30	1.40
d1	-	0.53	-
H	0.90	-	1.10
h1	0.08	-	0.15
h2	0.90	-	1.00
h3	-	-	0.10



10 Ordering Information

Part Number	Packaging	Reel Size
SLMT220V1CNK	3000/Tape & Reel	7 inch