

P-Channel Enhancement Mode MOSFET

1 Features

- $V_{DS} = -20V$, $I_D = -0.65A$
- $R_{DS(ON)} = 580m\Omega$ @ $V_{GS} = -4.5V$
- $R_{DS(ON)} = 850m\Omega$ @ $V_{GS} = -2.5V$
- $R_{DS(ON)} = 1300m\Omega$ @ $V_{GS} = -1.8V$
- High Power and current handing capability
- ESD Protected Up to 2.0KV (HBM)
- Package SOT-23

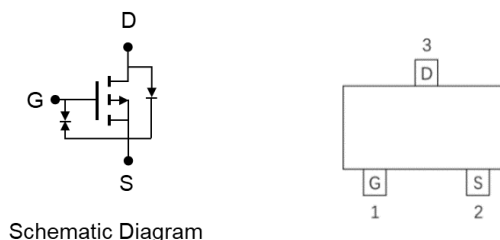
2 Applications

- PWM applications
- Load switch
- Power management

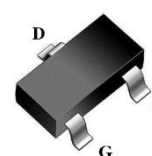
3 Description

The SLMT320V1CPK 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 -0.65V. This device is suitable for use as a load switch or in high power applications.

4 Pin Configuration and Top View



Schematic Diagram



SOT-23

5 Device Information

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SLMT320V1CPK	SOT-23	2.90 mm x 2.40 mm

6 Absolute maximum Ratings @25°C

RATING	SYMBOL	VALUE	UNITS
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	-0.65	A
Pulsed Drain Current	I_{DP}	-2.6	A
Total power dissipation	P_D	350	mW
Channel temperature	T_J	150	°C
Range of storage temperature	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	°C/W

7 Electrical characteristics (@25°C unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = -250\mu A, V_{GS} = 0V$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35	-0.65	-1.2	V
Drain Cut Off Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$			± 10	μA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = -4.5V, I_D = -0.5A$		580	850	m Ω
		$V_{GS} = -2.5V, I_D = -0.3A$		850	1200	m Ω
		$V_{GS} = -1.8V, I_D = -0.2A$		1300	1950	m Ω
Dynamic Characteristics						
Total Gate Charge	Q_G	$V_{DS} = -10V,$ $I_D = -0.5A,$ $V_{GS} = -4.5V$		1.24		nC
Gate-Source Charge	Q_{GS}			0.37		nC
Gate-Drain Charge	Q_{GD}			0.27		nC
Input Capacitance	C_{ISS}	$V_{DS} = -10V,$ $V_{GS} = 0V,$ $f = 1.0MHz$		71		pF
Reverse Transfer Capacitance	C_{RSS}			15		pF
Output Capacitance	C_{OSS}			20		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -4.5V, V_{DS} = -10V$ $I_D = 0.5A, R_G = 3\Omega$		4		ns
Turn-Off Delay Time	$t_{d(off)}$			16		ns
Rise Time	t_r			19		ns
Fall Time	t_f			25		ns
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	$I_S = -0.65A, V_{GS} = 0V$		-0.8	-1.2	V

8 Typical Characteristics

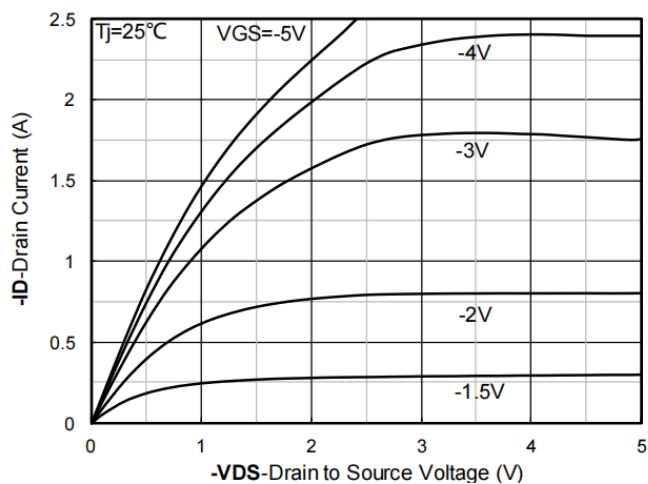


Fig 1. Output Characteristics

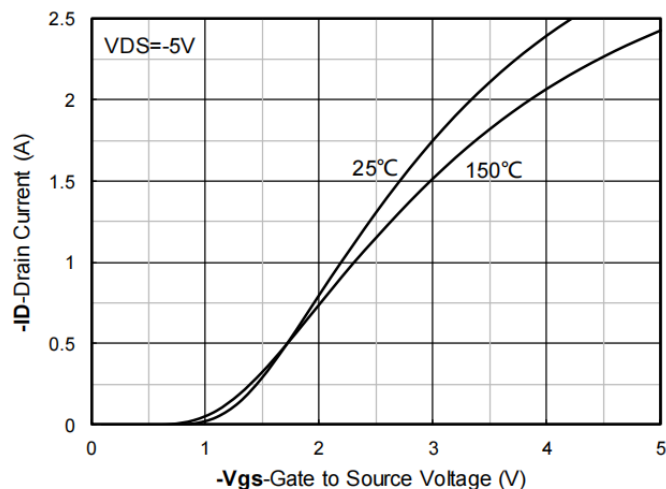


Fig 2. Transfer Characteristics

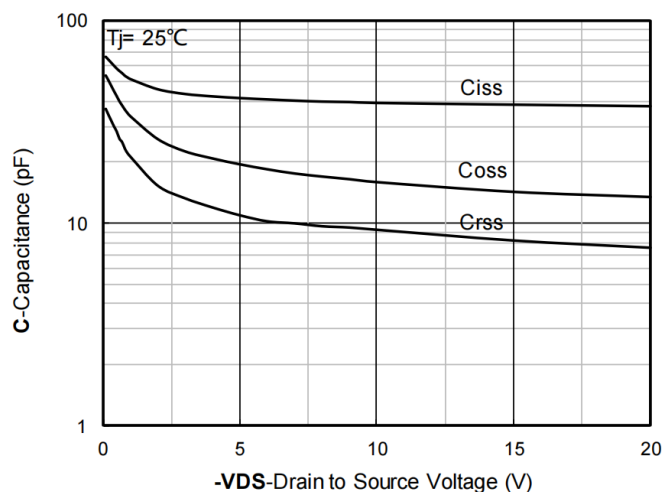


Fig 3. Capacitance Characteristics

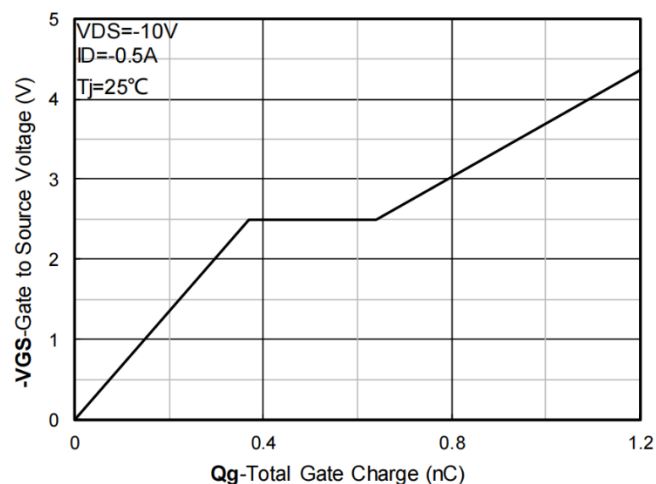


Fig 4. Gate Charge

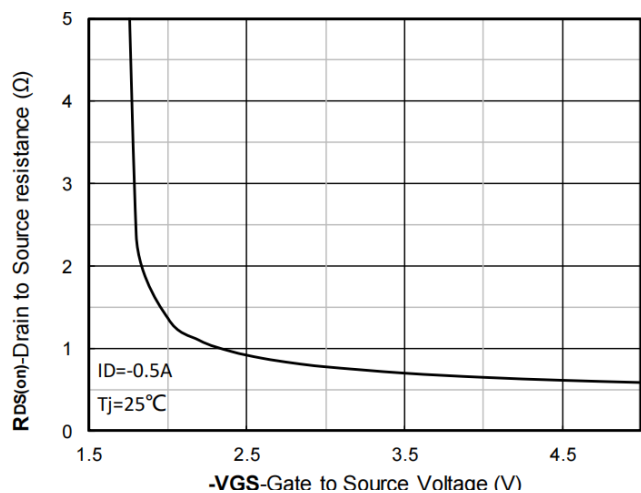


Fig 5. On-Resistance vs Gate to Source Voltage

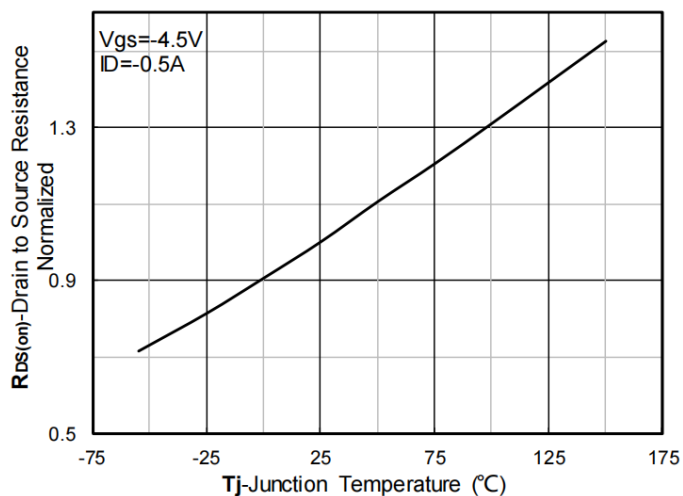


Fig 6. Normalized On-Resistance

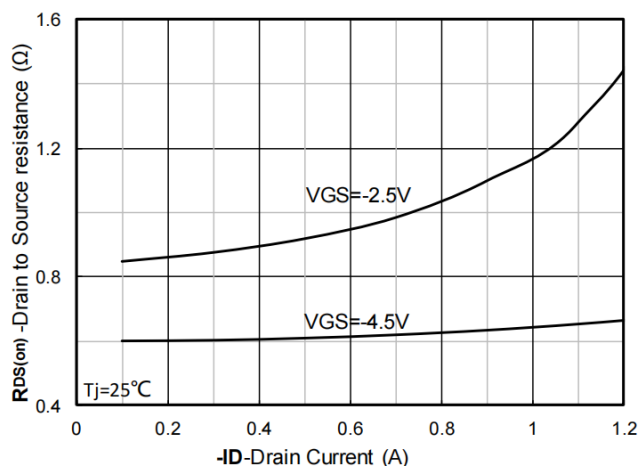


Fig 7. $R_{DS(on)}$ VS Drain Current

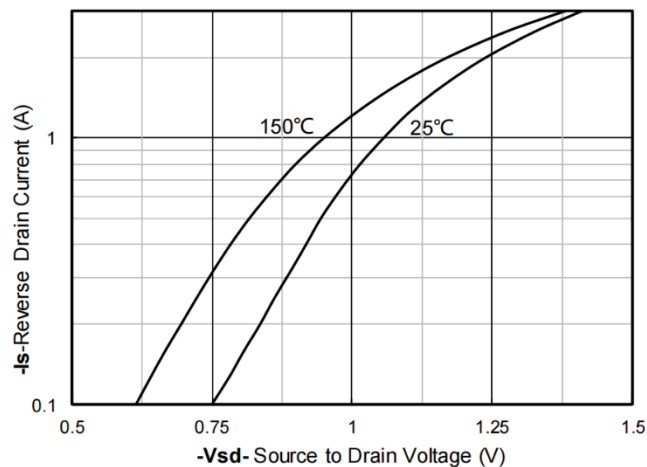


Fig 8. Forward characteristics of reverse diode

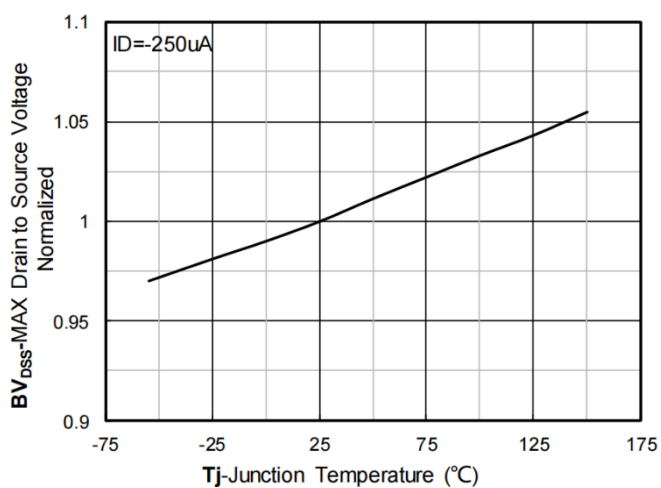


Fig 9. Normalized breakdown voltage

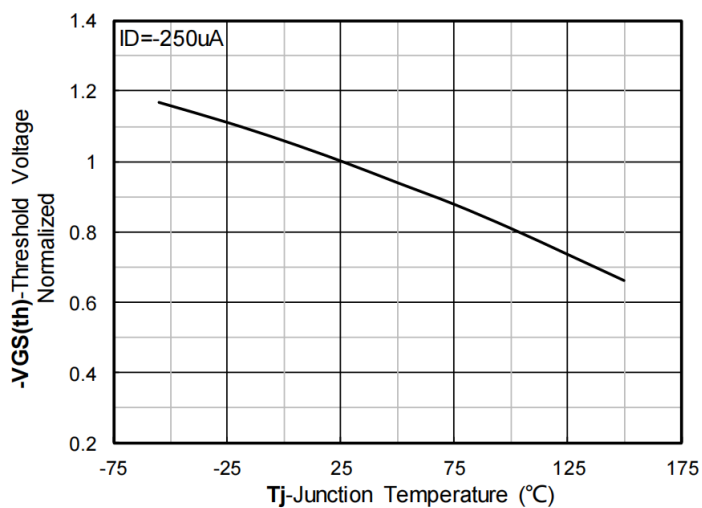
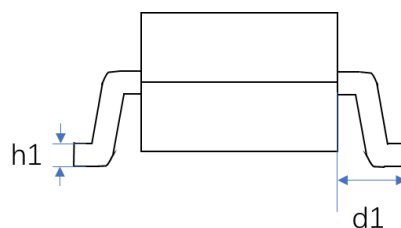
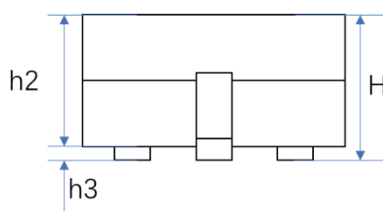


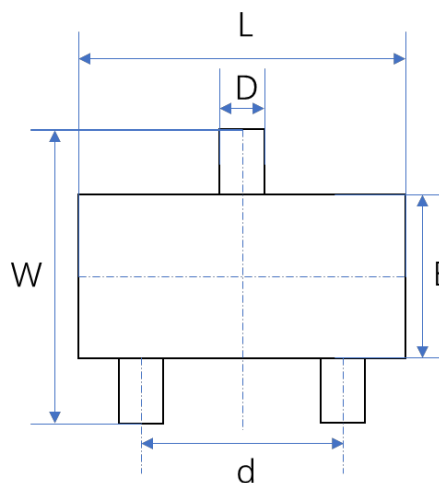
Fig 10. Normalized Threshold voltage

9 Product dimension

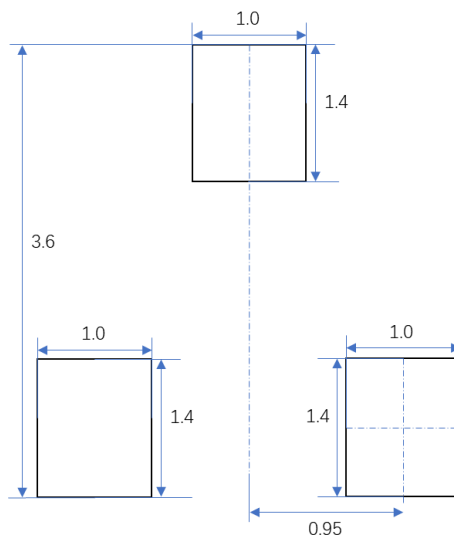
SOT-23



DIM	UNITS (mm)		
	MIN.	TYP.	MAX.
L	2.70	-	3.12
W	2.10	-	2.64
D	0.30	-	0.50
E	1.10	-	1.50
d	1.80	-	2.00
d1	-	0.55	-
H	0.90	-	1.15
h1	0.08	-	0.21
h2	0.86	-	1.05
h3	0.04	-	0.15



10 PCB Layout Footprints (Units: mm)



11 Ordering Information

Part Number	Packaging	Reel Size
SLMT320V1CPK	3000/Tape & Reel	7 inch