

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead are free

FEATURES

- 20V/6.5A
 $R_{DS(ON)} \leq 20m\Omega$ @ $V_{GS}=4.5V$
 $R_{DS(ON)} \leq 26m\Omega$ @ $V_{GS}=2.5V$
- ESD Protection
- Reliable and Rugged
- Green Device Available

APPLICATION

Power Management in Notebook Computer,
Portable Equipment and Battery Powered Systems.

MARKING

1520NE

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

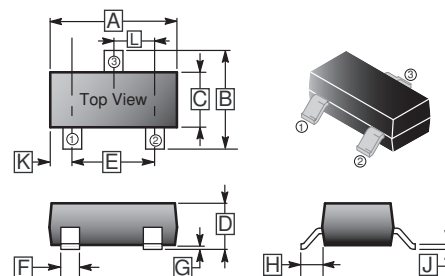
ORDER INFORMATION

Part Number	Type
SMS1520NE-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹ , @ $V_{GS}=4.5V$	I_D	$T_A=25^\circ C$	6.5
		$T_A=70^\circ C$	5
Pulsed Drain Current ³	I_{DM}	20	A
Power Dissipation	P_D	1.4	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ C$
Thermal Resistance Ratings			
Thermal Resistance Junction-ambient ¹	$R_{\theta JA}$	$t \leq 10sec$	90
		Steady State	178
Thermal Resistance Junction-ambient ²			357

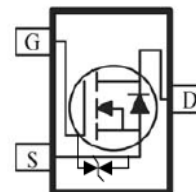
SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0	0.18
B	2.10	2.95	H	0.55	REF.
C	1.20	1.7	J	0.08	0.20
D	0.89	1.3	K	0.6	REF.
E	1.70	2.3	L	0.95	BSC.
F	0.30	0.50			



ESD
Protection Diode



ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

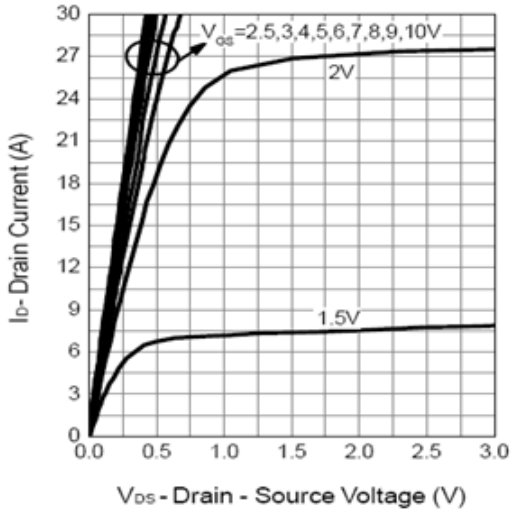
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$	
Gate Threshold Voltage	$V_{GS(th)}$	0.3	-	1	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	
Gate- Source Leakage Current	I_{GSS}	-	-	± 10	μA	$V_{GS}=\pm 12\text{V}$	
Drain-Source Leakage Current	I_{DSS}	$T_J=25^\circ\text{C}$	-	-	1	μA	$V_{DS}=16\text{V}, V_{GS}=0$
		$T_J=85^\circ\text{C}$	-	-	30		
Static Drain-Source On-Resistance ⁴	$R_{DS(ON)}$	-	-	20	m Ω	$V_{GS}=4.5\text{V}, I_D=5\text{A}$	
		-	-	26		$V_{GS}=2.5\text{V}, I_D=2.5\text{A}$	
Total Gate Charge	Q_g	-	14.7	-	nC	$I_{DS}=5\text{A}$ $V_{DS}=10\text{V}$ $V_{GS}=4.5\text{V}$	
Gate-Source Charge	Q_{gs}	-	2	-			
Gate-Drain Charge	Q_{gd}	-	4.4	-			
Turn-on Delay Time	$T_{d(on)}$	-	6	-	nS	$V_{DD}=10\text{V}$ $I_{DS}=1\text{A}$ $V_{GS}=4.5\text{V}$ $R_{GEN}=6\Omega$ $R_L=10\Omega$	
Rise Time	T_r	-	11	-			
Turn-off Delay Time	$T_{d(off)}$	-	58	-			
Fall Time	T_f	-	29	-			
Input Capacitance	C_{iss}	-	1050	-	pF	$V_{GS}=0$ $V_{DS}=10\text{V}$ $f=1\text{MHz}$	
Output Capacitance	C_{oss}	-	170	-			
Reverse Transfer Capacitance	C_{rss}	-	145	-			
Source-Drain Diode							
Continuous Source Current ¹	I_S	-	-	1	A		
Pulsed Source Current ³	I_{SM}	-	-	20			
Forward On Voltage ⁴	V_{SD}	-	-	1.2	V	$I_S=1\text{A}, V_{GS}=0$	

Notes:

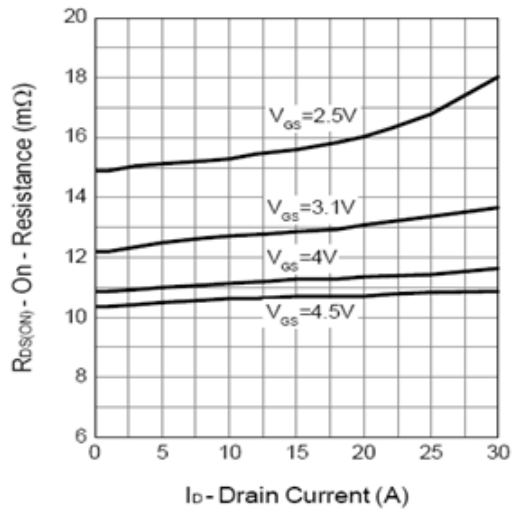
1. Surface Mounted on 1"x1" FR4 Board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by maximum junction temperature, Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$.
4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

CHARACTERISTIC CURVES

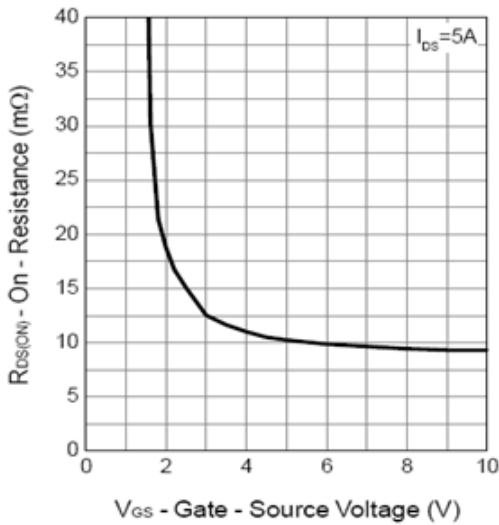
Output Characteristics



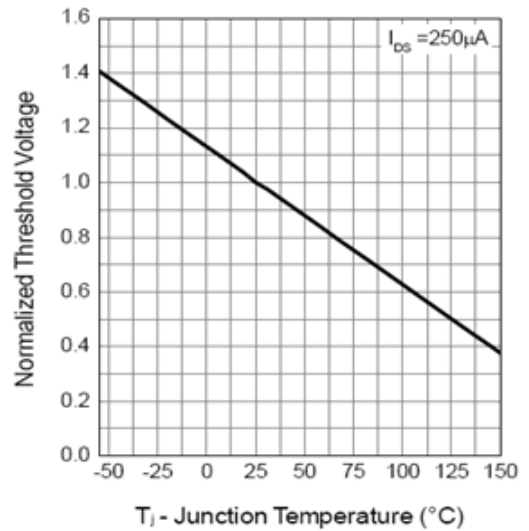
Drain-Source On Resistance



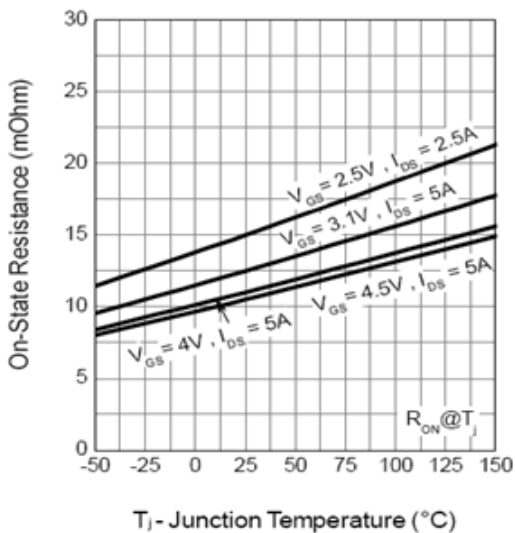
Gate-Source On Resistance



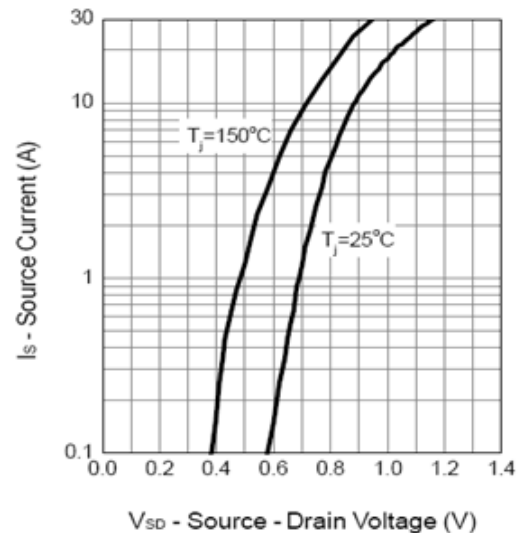
Gate Threshold Voltage



Drain-Source On Resistance

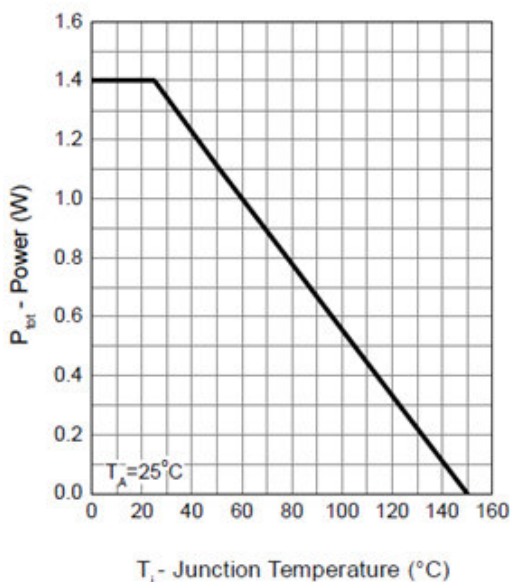


Source-Drain Diode Forward

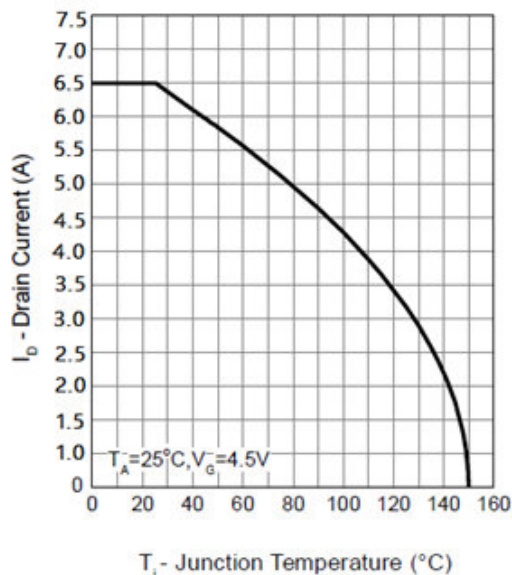


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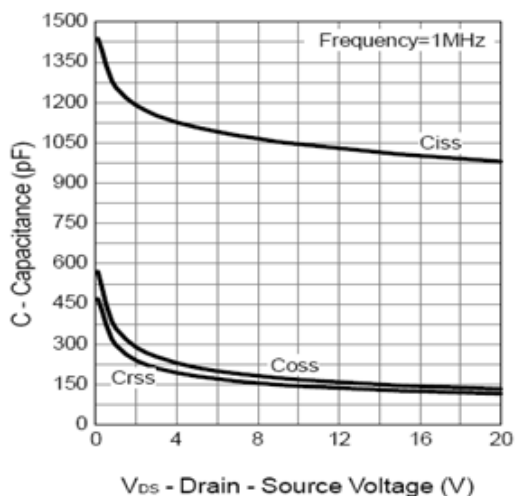
Power Dissipation



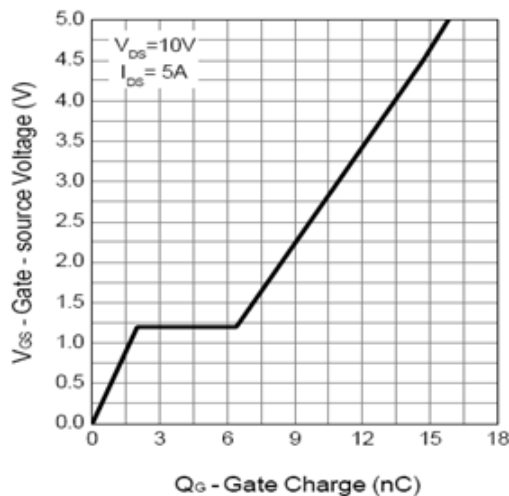
Drain Current



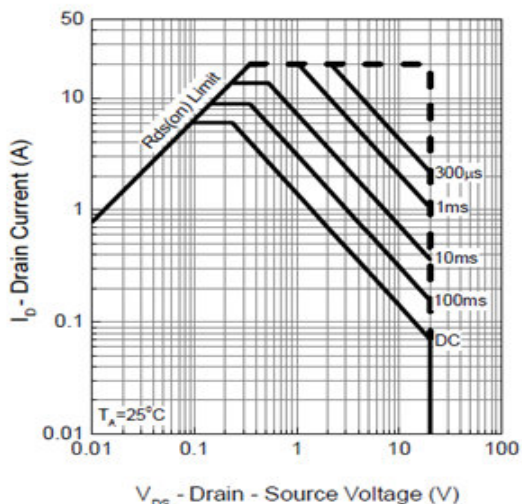
Capacitance



Gate Charge



Safe Operation Area



Thermal Transient Impedance

