

Common-Drain Dual N-Channel MOSFET

DESCRIPTION

SMC3320 is the Dual N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology to provide excellent $R_{DS(ON)}$. These devices are well suited for high efficiency fast switching applications, low in-line power loss are needed in small outline surface mount package.

PART NUMBER INFORMATION

SMC 3320 W - TR G
 a b c d e

- a : Company name.
- b : Product Serial number.
- c : Package code W:TSSOP-8
- d : Handling code TR:Tape&Reel
- e : Green produce code G:RoHS Compliant

FEATURES

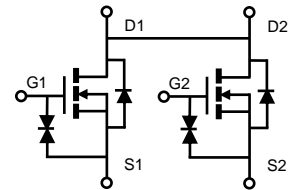
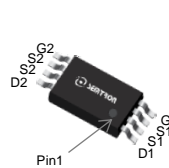
$V_{DS} = 20V, I_D = 7.6A$

- $R_{DS(ON)} = 14.0m\Omega(Typ.) @ V_{GS} = 4.5V$
- $R_{DS(ON)} = 14.5m\Omega(Typ.) @ V_{GS} = 4.0V$
- $R_{DS(ON)} = 15.5m\Omega(Typ.) @ V_{GS} = 3.2V$
- $R_{DS(ON)} = 17.8m\Omega(Typ.) @ V_{GS} = 2.5V$
- $R_{DS(ON)} = 24.5m\Omega(Typ.) @ V_{GS} = 1.8V$

- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability

APPLICATIONS

- ◆ Power Management in Notebook Computer
- ◆ Portable Equipment and Battery Powered.



TSSOP-8

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ Unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	7.6
		$T_A = 70^\circ C$	6.1
I_{DM}	Pulsed Drain Current ^A	30	A
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	1.4
		$T_A = 70^\circ C$	0.9
T_J	Operation Junction Temperature	-55/150	$^\circ C$
T_{STG}	Storage Temperature Range	-55/150	$^\circ C$

THERMAL RESISTANCE

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ^B	$t \leq 10s$	90	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BC}	Steady-State	120	

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

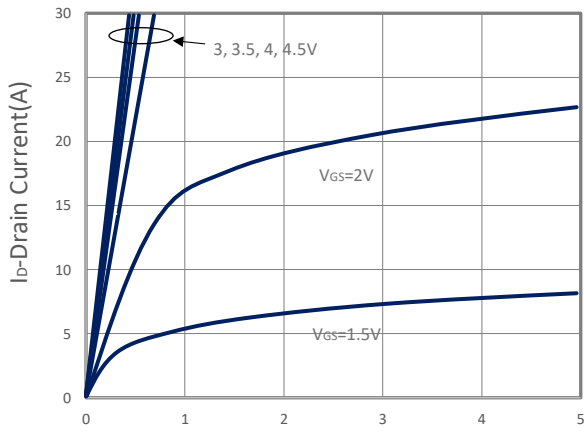
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.4	0.6	1.0	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±10	μA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V, T _J =25°C			1	μA
		V _{DS} =16V, V _{GS} =0V, T _J =75°C			10	
R _{DS(ON)}	Drain-source On-Resistance	V _{GS} =4.5V, I _D =7.6A		14	16	mΩ
		V _{GS} =4.0V, I _D =7.0A		14.5	17	
		V _{GS} =3.2V, I _D =6.5A		15.5	18	
		V _{GS} =2.5V, I _D =5.5A		17.8	21	
		V _{GS} =1.8V, I _D =4.0A		24.5	29	
G _{fs}	Forward Transconductance	V _{DS} =5V, I _D =8A		25		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V			1	V
I _S	Continuous Source Current				3.8	A
Dynamic Parameters						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =7.6A		7	9.8	nC
Q _{gs}	Gate-Source Charge			0.6	0.8	
Q _{gd}	Gate-Drain Charge			2.2	3.1	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f =1MHz		790		pF
C _{oss}	Output Capacitance			110		
C _{rss}	Reverse Transfer Capacitance			68		
t _{d(on)}	Turn-On Time	V _{DD} =10V, V _{GEN} =4.5V, R _G =6Ω, I _D =1A		5.4	10	nS
t _r				14	27	
t _{d(off)}	Turn-Off Time			18	34	
t _f				4	8	

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

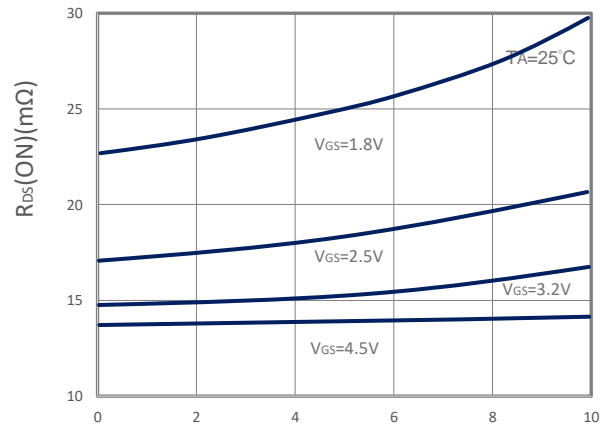
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- Measure the value in a still air environment at T_A=25°C, using an installation mounted on a 1 in2 FR-4 board, maximum junction temperature T_{J(MAX)}=150°C.
- T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.

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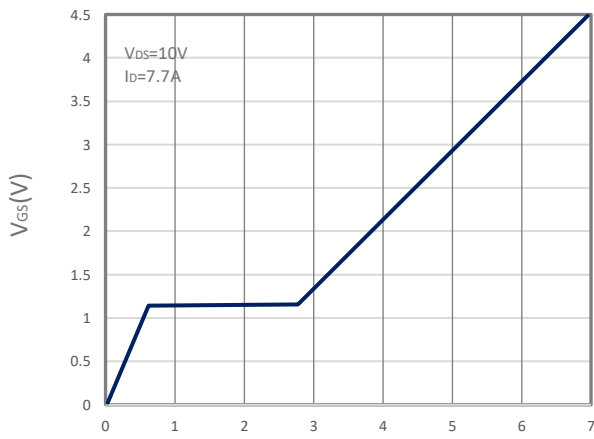
TYPICAL CHARACTERISTICS



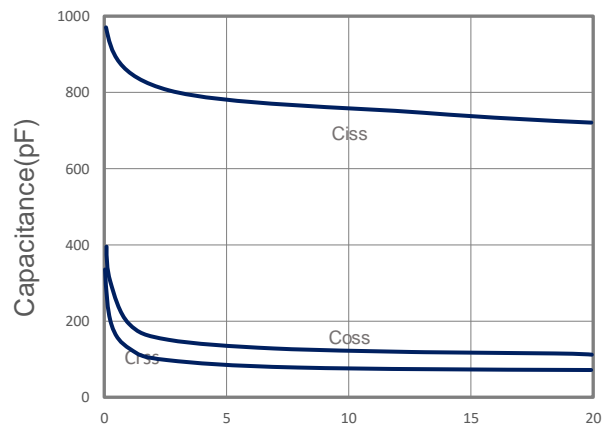
Output Characteristics



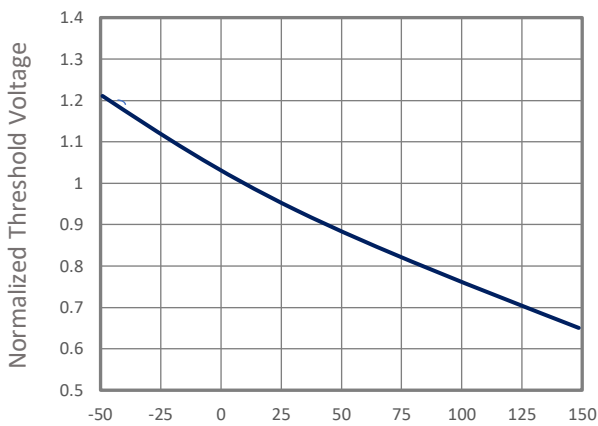
Drain-Source On Resistance



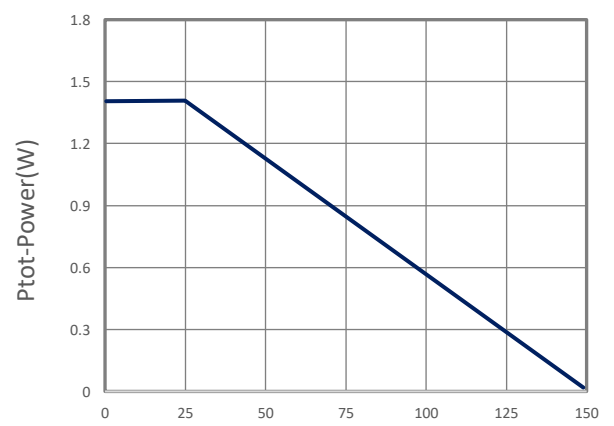
Gate Charge



Capacitance

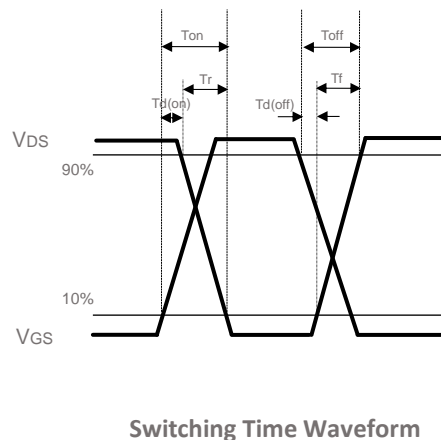
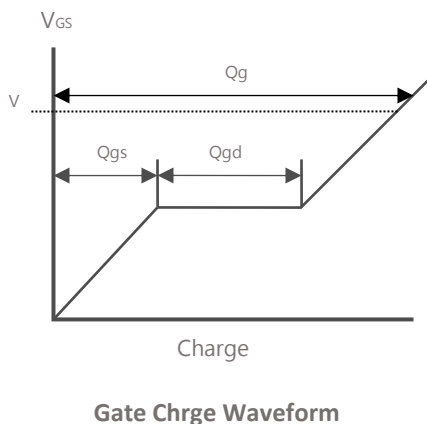
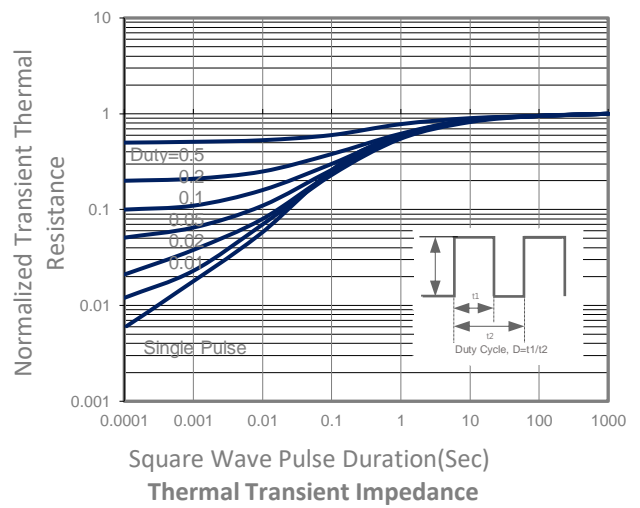
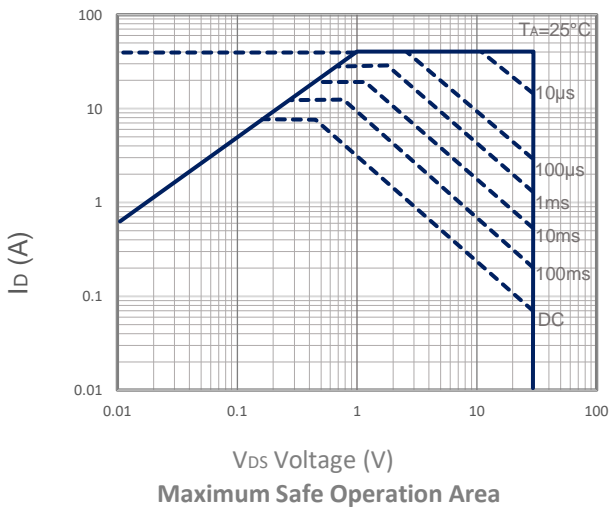
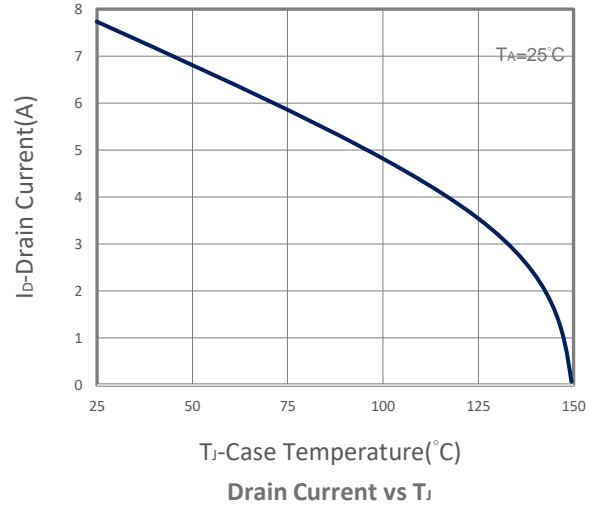
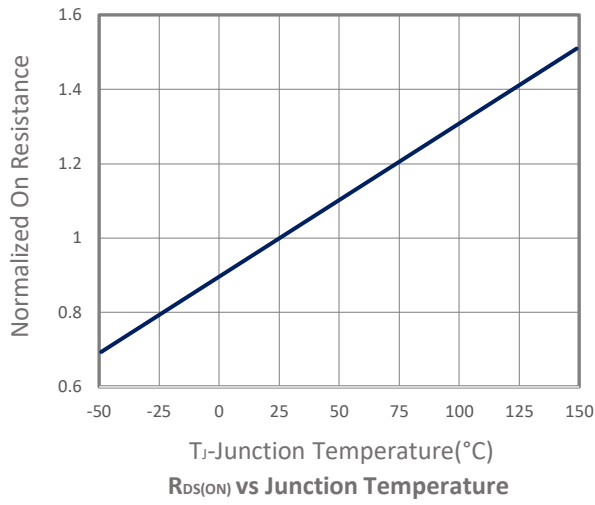


Gate Threshold Voltage

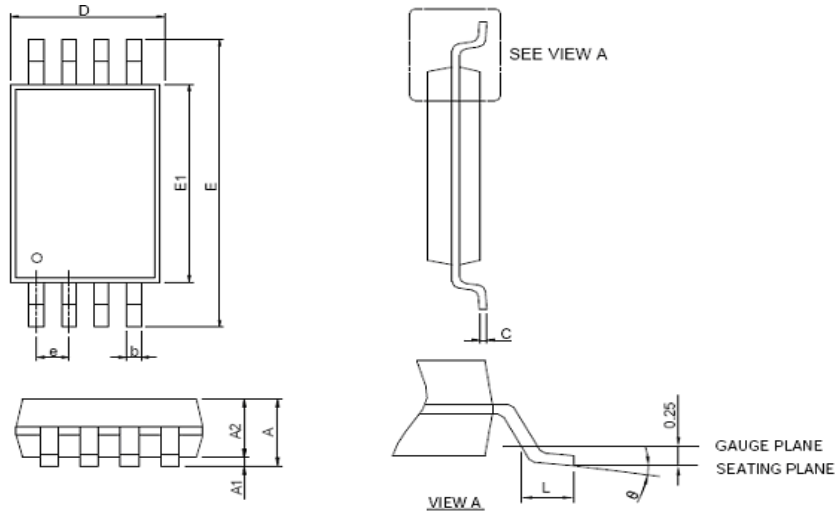


Power Dissipation

TYPICAL CHARACTERISTICS



TSSOP-8 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A		1.200		0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
D	2.900	3.100	0.114	0.122
E	6.200	6.600	0.244	0.260
E1	4.300	4.500	0.169	0.177
e	0.650 REF		0.026 REF	
L	0.450	0.750	0.018	0.030
θ	0°	8°	0°	8°