

DESCRIPTION

SMC2360ASN is the N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology 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 **2360A** **SN** - **TR** **G**
 a b c d e

- a : Company name.
- b : Product Serial number.
- c : Package code S: SOT-23
- d : Handling code TR: Tape&Reel
- e : Green produce code G: *RoHS Compliant*

FEATURES

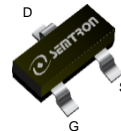
$V_{DS}=60V, I_D=3.3A$

$R_{DS(ON)}=67m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)}=76m\Omega(Typ.)@V_{GS}=4.5V$

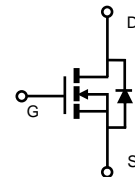
- ◆ Fast switch

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Power Management
- ◆ LED Lighting



SOT-23



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A=25^\circ C$	3.3
		$T_A=70^\circ C$	3.0
I_{DM}	Pulsed Drain Current ^B	13.4	A
I_{AS}	Avalanche Current ^B	5	A
E_{AS}	Single Pulse Avalanche energy $L=0.3mH$ ^B	3.75	mJ
P_D	Power Dissipation ^A	$T_A=25^\circ C$	1.6
		$T_A=70^\circ C$	1
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 ^A	$t \leq 10s$	80	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	130	

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

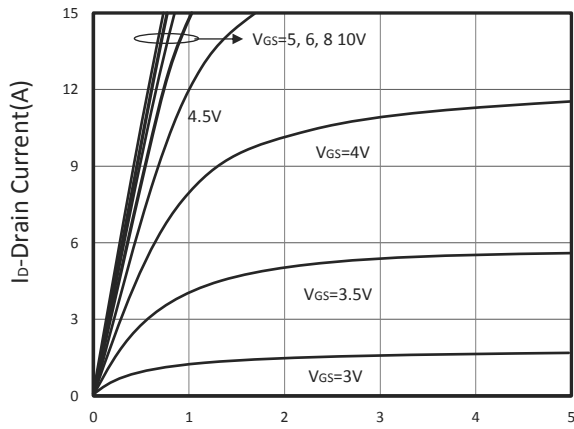
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.2	1.9	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V, T _J =25°C			1	μA
		V _{DS} =48V, V _{GS} =0V, T _J =75°C			10	
R _{DS(ON)}	Drain-source On-Resistance ^D	V _{GS} =10V, I _D =3.3A V _{GS} =4.5V, I _D =2.3A		67 76	80 90	mΩ
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3.3A		6.2		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =1A, V _{GS} =0V		0.75	1	V
I _S	Diode Continuous Forward Current				1.7	A
Dynamic and Switching Parameter ^E						
Q _g	Total Gate Charge (10V)	V _{DS} =30V, V _{GS} =10V, I _D =3.3A		6.6	9.8	nC
Q _g	Total Gate Charge (4.5V)			3.2	4.8	
Q _{gs}	Gate-Source Charge			1.4	2.1	
Q _{gd}	Gate-Drain Charge			1.0	1.5	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz		426		pF
C _{oss}	Output Capacitance			35		
C _{rss}	Reverse Transfer Capacitance			14		
t _{d(on)}	Turn-On Time	V _{DD} =30V, V _{GEN} =10V, R _G =3.3Ω, I _D =1A		4.5	8.0	nS
t _r				8.0	15	
t _{d(off)}	Turn-Off Time			14	25	
t _f				5.0	9	

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

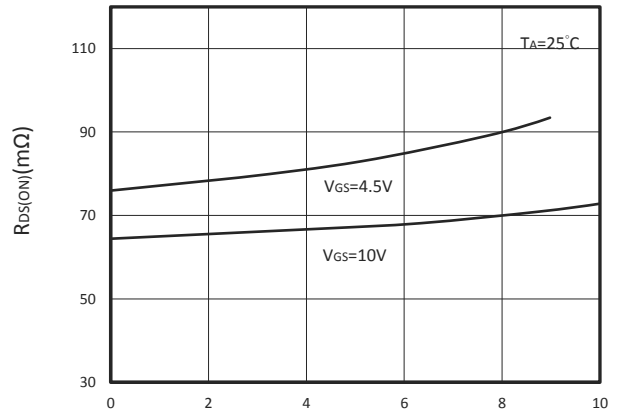
- A. Surface mounted on FR4 board using 1 in² pad size
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C (initial temperature T_J=25°C).
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. Guaranteed by design, not subject to production testing.

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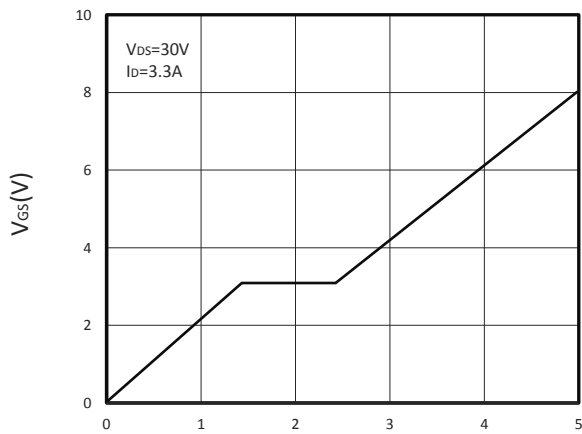
TYPICAL CHARACTERISTICS



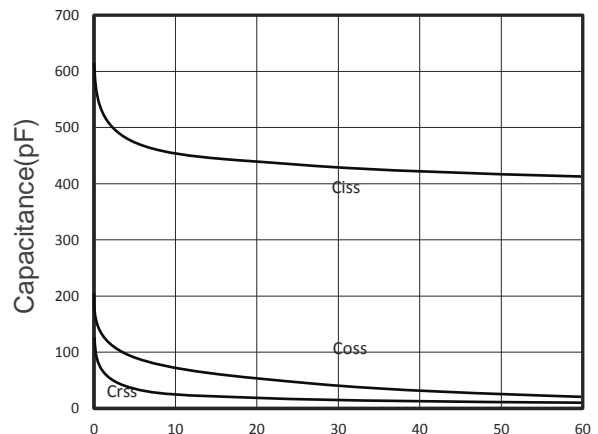
Output Characteristics



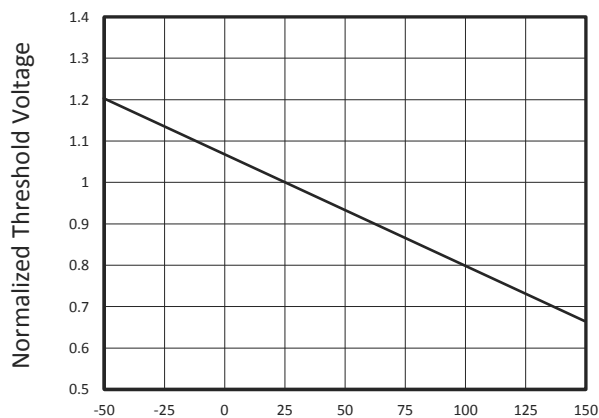
Drain-Source On Resistance



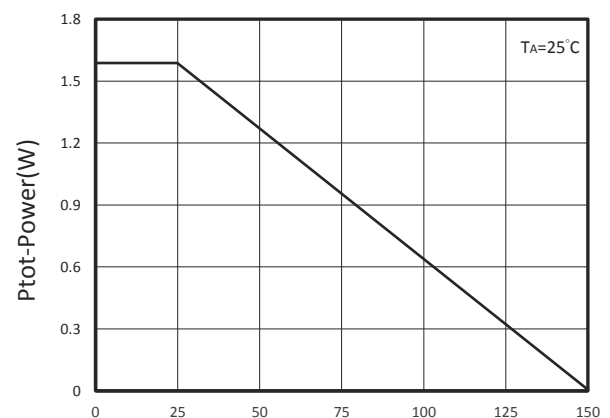
Gate Charge



Capacitance

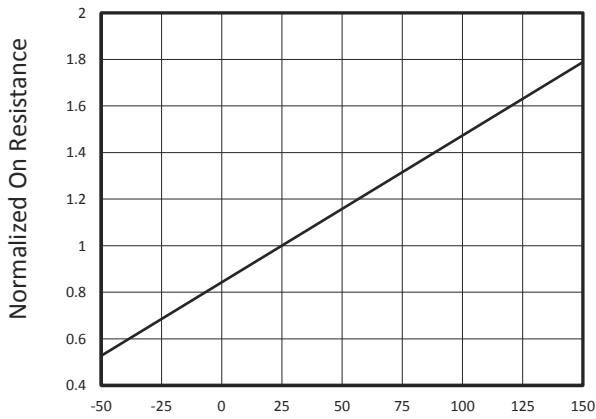


Gate Threshold Voltage

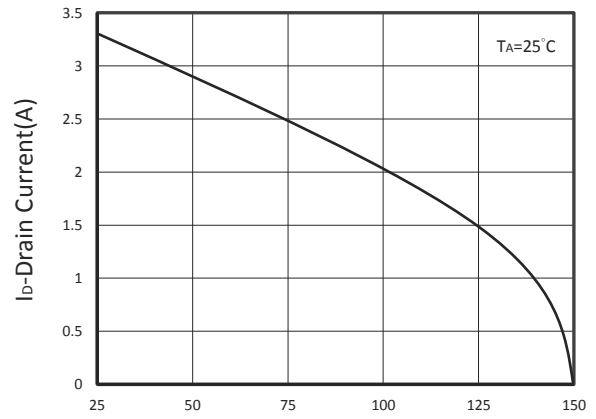


Power Dissipation

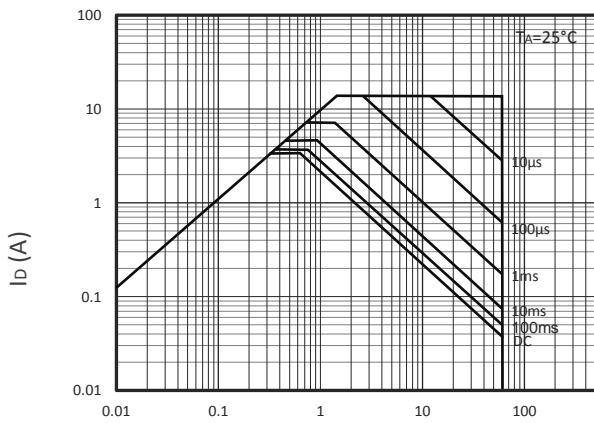
TYPICAL CHARACTERISTICS



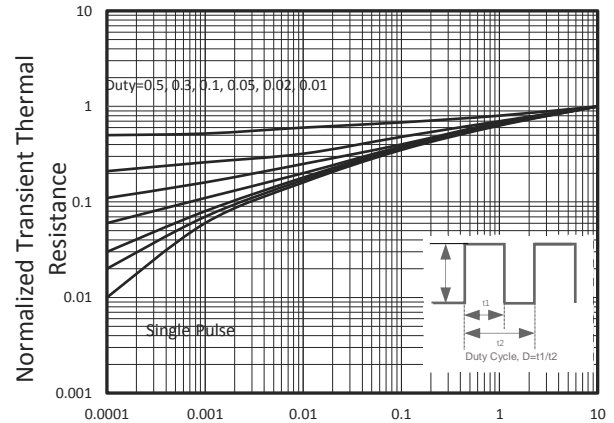
T_J-Junction Temperature(°C)
Drain-Source On Resistance



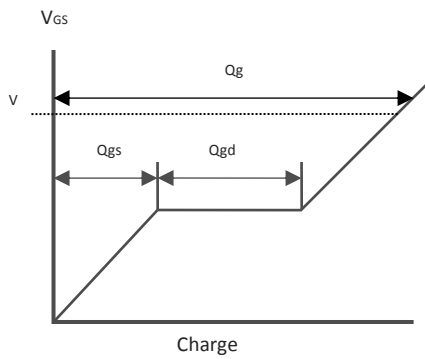
T_J-Junction Temperature(°C)
Drain Current vs T_J



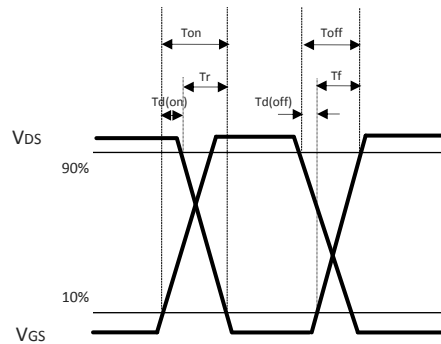
V_{DS} Voltage (V)
Maximum Safe Operation Area



Square Wave Pulse Duration (Sec)
Thermal Transient Impedance

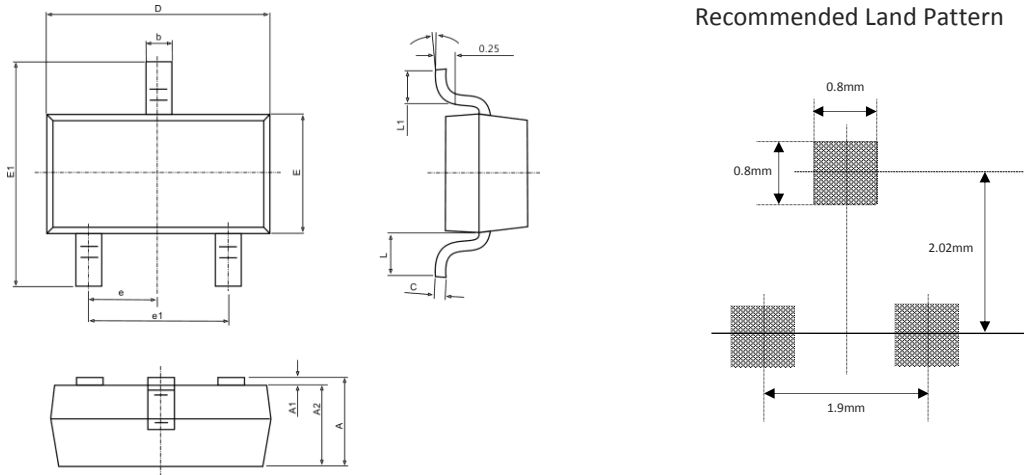


Gate Charge Waveform



Switching Time Waveform

■ SOT-23 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.940	1.120	0.037	0.044
A1	0.040	0.120	0.002	0.005
A2	0.900	1.000	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.004	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.500	0.600	0.020	0.024
L	0.550 BSC		0.022 BSC.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°