

Single N-Channel MOSFET

DESCRIPTION

SMC2360 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 2360 S - 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

$V_{DS} = 60V, I_D = 3.8A$

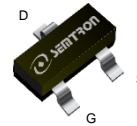
$R_{DS(ON)} = 58m\Omega (Typ.) @ V_{GS} = 10V$

$R_{DS(ON)} = 66m\Omega (Typ.) @ V_{GS} = 4.5V$

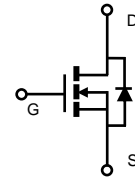
- ◆ Fast switch

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	$T_A = 25^\circ C$	3.8
		$T_A = 70^\circ C$	3.1
I_{DM}	Pulsed Drain Current ^A	15.2	A
I_{AS}	Avalanche Current ^A	5	A
E_{AS}	Single Pulse Avalanche energy $L=0.3mH$ ^{AF}	3.75	mJ
P_D	Power Dissipation ^C	$T_A = 25^\circ C$	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 ^B	$t \leq 10s$	80	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	120	

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

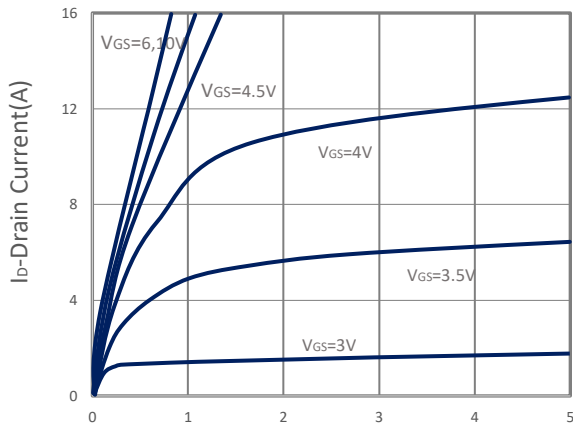
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μ A	1.2	1.8	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 20V			\pm 100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V, T _J =25 $^\circ$ C			1	μ A
		V _{DS} =48V, V _{GS} =0V, T _J =75 $^\circ$ C			10	
R _{DS(ON)}	Drain-source On-Resistance	V _{GS} =10V, I _D =3.8A V _{GS} =4.5V, I _D =3.1A		58 66	64 76	m Ω
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3.8A		2		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.75	1	V
I _S	Continuous Source Current				2	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge (10V)	V _{DS} =30V, V _{GS} =10V, I _D =3.8A		9.2	12.9	nC
Q _g	Total Gate Charge (4.5V)			4.6	6.4	
Q _{gs}	Gate-Source Charge			2.1	2.9	
Q _{gd}	Gate-Drain Charge			1.8	2.5	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz		490		pF
C _{oss}	Output Capacitance			42		
C _{rss}	Reverse Transfer Capacitance			15		
t _{d(on)}	Turn-On Time	V _{DD} =30V, V _{GEN} =10V, R _G =3.3 Ω , I _D =1A		4.7	9	nS
t _r				9.5		
t _{d(off)}	Turn-Off Time			18.4		
t _f				5.3		

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

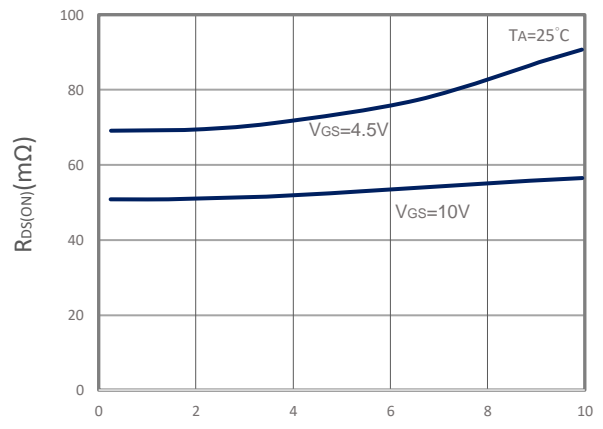
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^\circ$ C.
- The value of R θ _{JA} is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150 $^\circ$ C (initial temperature T_A=25 $^\circ$ C).
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-ambient thermal resistance, t \leq 10sec.
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-case thermal resistance (R θ _{JC}) is more useful in additional heat sinking is used.
- The data tested by pulsed, pulse width \leq 300 μ s, duty cycle \leq 2%.
- The EAS data shows Max, tested and pulse width limited by T_{J(MAX)}=150 $^\circ$ C (initial temperature T_J=25 $^\circ$ C).

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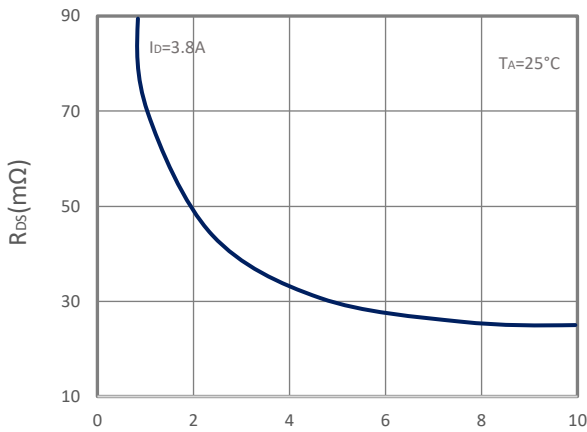
TYPICAL CHARACTERISTICS



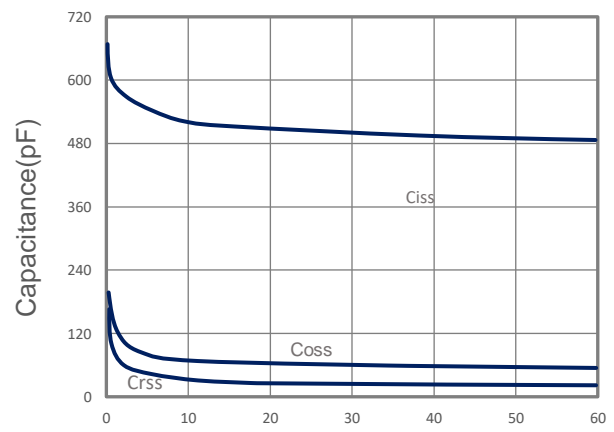
Output Characteristics



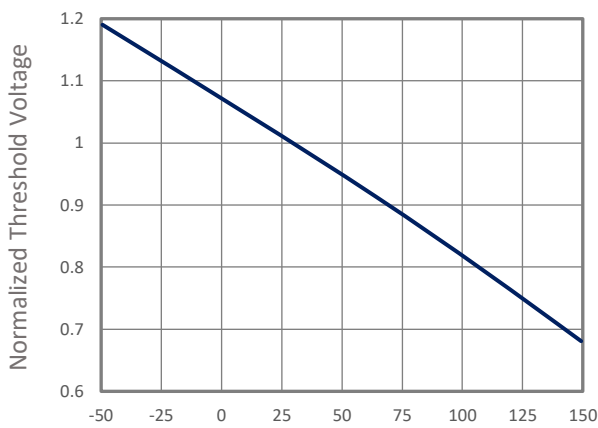
Drain-Source On Resistance



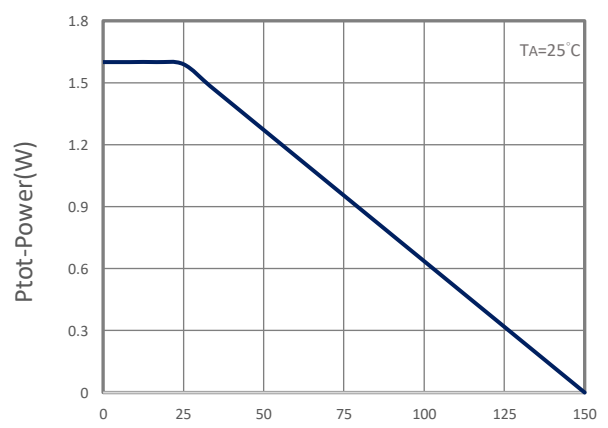
Gate-Source vs On Resistance



Capacitance

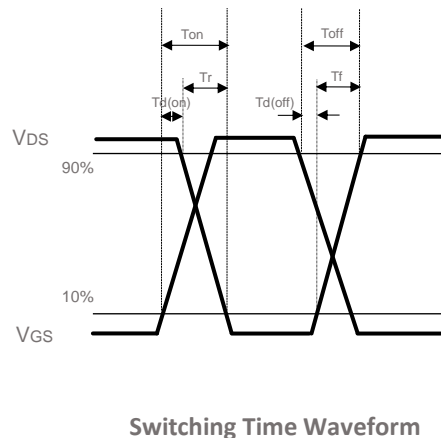
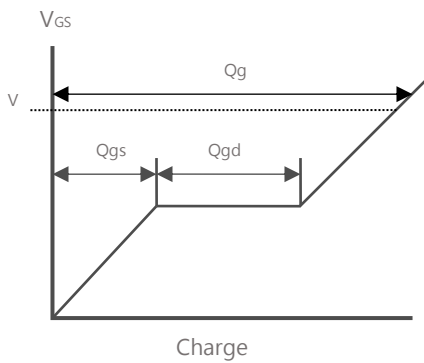
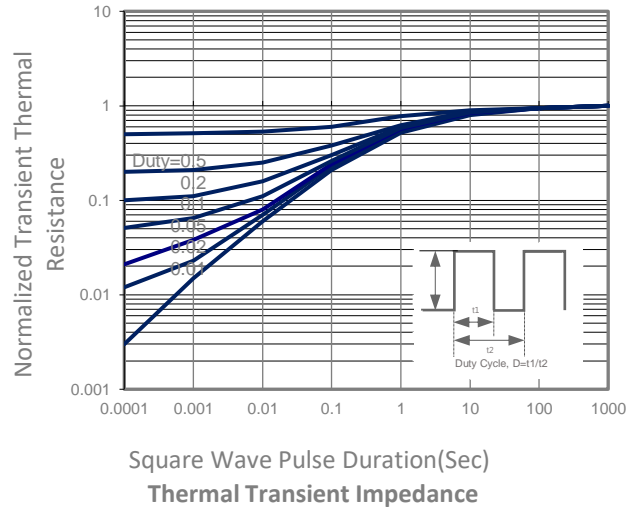
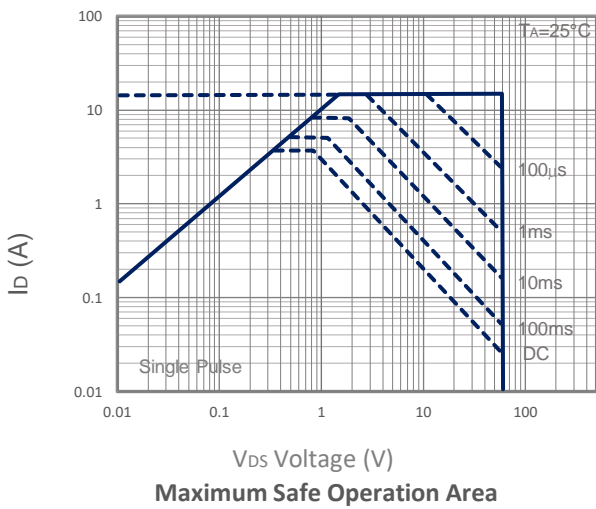
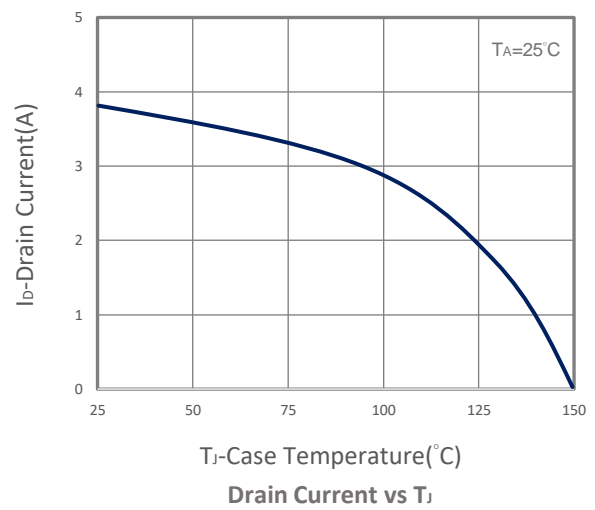
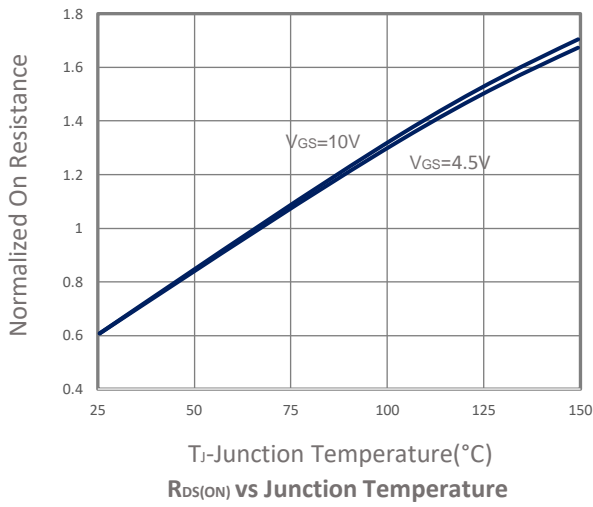


Gate Threshold Voltage

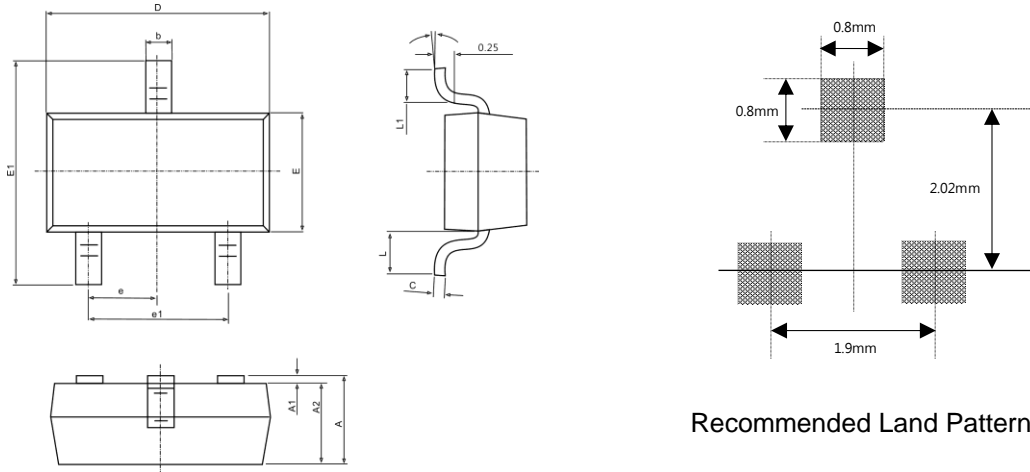


Power Dissipation

TYPICAL CHARACTERISTICS



■ SOT-23 PACKAGE DIMENSIONS



Recommended Land Pattern

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
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 TYP.		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°