

# SMG1332E

600mA, 20V, R<sub>DS(ON)</sub>600mΩ

N-Channel Enhancement Mode Power Mos.FET

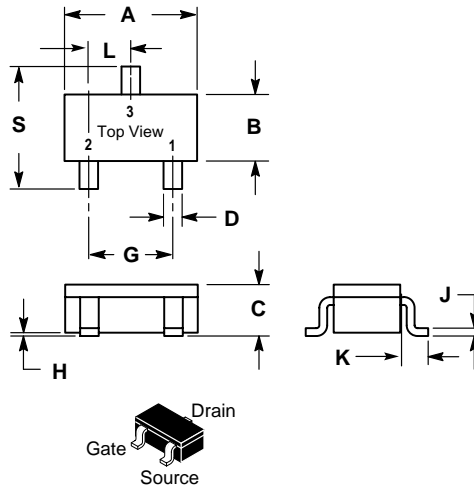
RoHS Compliant Product

## Description

The SMG1332E provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness.

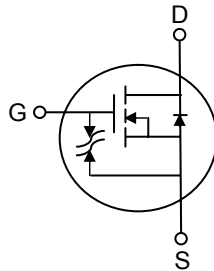
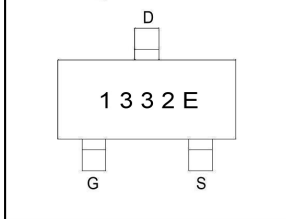
## Features

- \* Simple Gate Drive
- \* 2KV ESD Rating (Per MIL-STD-883D)
- \* Small Package Outline



SC-59		
Dim	Min	Max
A	2.70	3.10
B	1.40	1.60
C	1.00	1.30
D	0.35	0.50
G	1.70	2.10
H	0.00	0.10
J	0.10	0.26
K	0.20	0.60
L	0.85	1.15
S	2.40	2.80
All Dimension in mm		

Marking :



## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±5	V
Continuous Drain Current <sup>3</sup>	I <sub>D@T<sub>A</sub>=25°C</sub>	600	mA
Continuous Drain Current <sup>3</sup>	I <sub>D@T<sub>A</sub>=70°C</sub>	470	mA
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	2.5	A
Total Power Dissipation	P <sub>D@T<sub>A</sub>=25°C</sub>	1.0	W
Linear Derating Factor		0.008	W/°C
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55~+150	°C

## Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient <sup>3</sup>	R <sub>thj-a</sub>	125	°C/W

### Electrical Characteristics( T<sub>j</sub>=25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA
Breakdown Voltage Temp. Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	0.02	-	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	1.2	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±10	uA	V <sub>GS</sub> =±5V
Drain-Source Leakage Current (T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0
Drain-Source Leakage Current (T <sub>j</sub> =70°C)		-	-	10	uA	V <sub>DS</sub> =16V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	-	600	Ω	V <sub>GS</sub> =4.5V, I <sub>D</sub> =600mA
		-	-	1200		V <sub>GS</sub> =2.5V, I <sub>D</sub> =400mA
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	1.3	2	nC	I <sub>D</sub> =600mA V <sub>DS</sub> =16V V <sub>GS</sub> =4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	0.3	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	0.5	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(ON)</sub>	-	4	-	nS	V <sub>DD</sub> =10V I <sub>D</sub> =600mA V <sub>GS</sub> =10V R <sub>G</sub> =3.3Ω R <sub>D</sub> =16.7Ω
Rise Time	T <sub>r</sub>	-	10	-		
Turn-off Delay Time	T <sub>d(OFF)</sub>	-	15	-		
Fall Time	T <sub>f</sub>	-	2	-		
Input Capacitance	C <sub>iss</sub>	-	38	60	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =10V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	17	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	12	-		
Forward Transconductance	G <sub>fs</sub>	-	1	-	S	V <sub>DS</sub> =5V, I <sub>D</sub> =600mA

### Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage <sup>2</sup>	V <sub>DS</sub>	-	-	1.2	V	I <sub>S</sub> =300mA, V <sub>GS</sub> =0V.

Notes: 1.Pulse width limited by Max. junction temperature.

2.Pulse width ≤300us, dutycycle ≤2%.

3.Surface mounted on FR4 board, t ≤10sec.

### Characteristics Curve

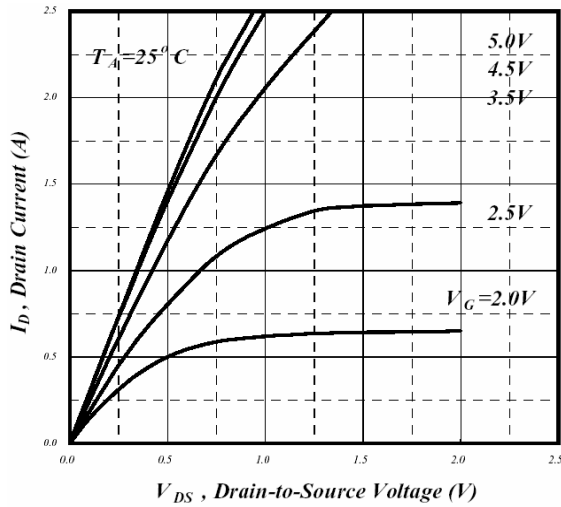


Fig 1. Typical Output Characteristics

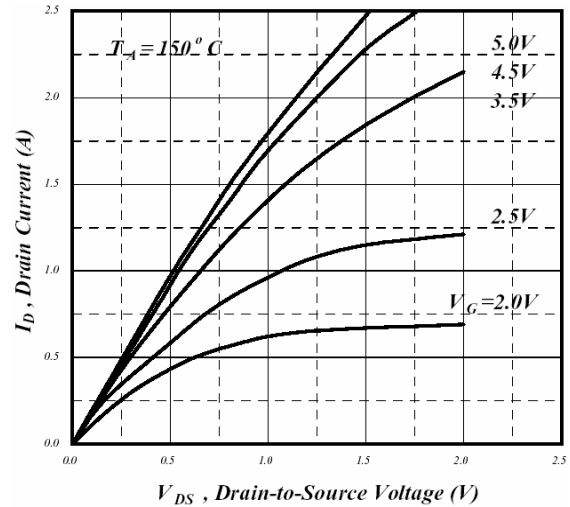


Fig 2. Typical Output Characteristics

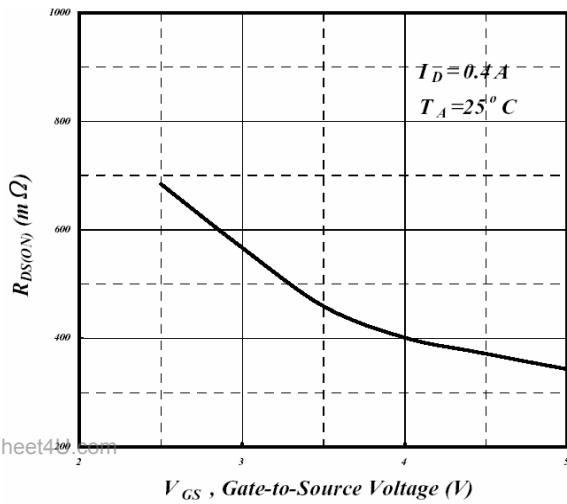


Fig 3. On-Resistance v.s. Gate Voltage

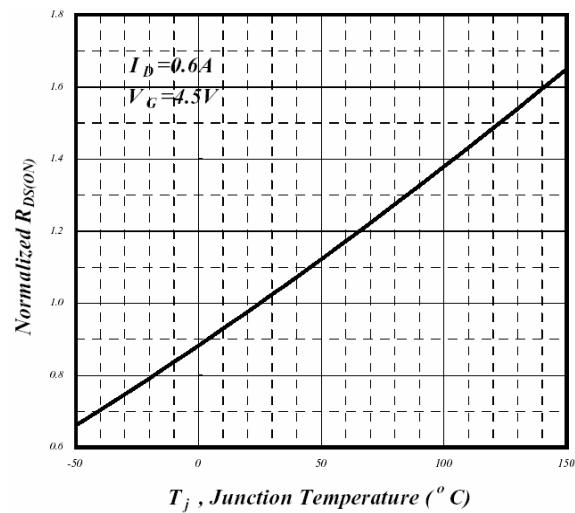


Fig 4. Normalized On-Resistance v.s. Junction Temperature

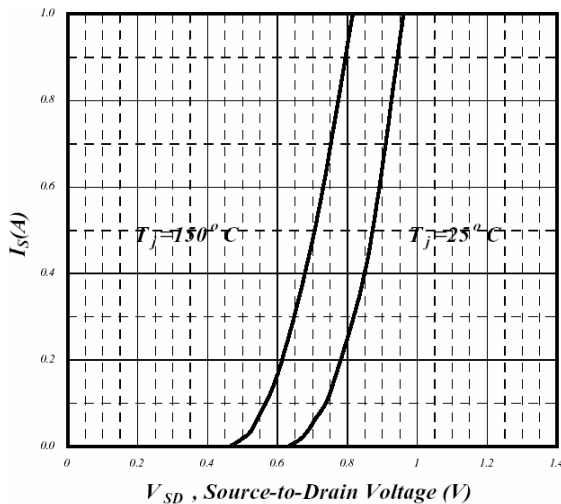


Fig 5. Forward Characteristics of Reverse Diode

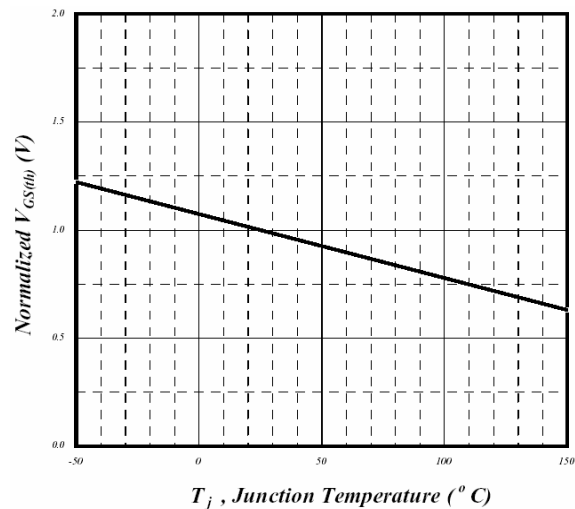


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

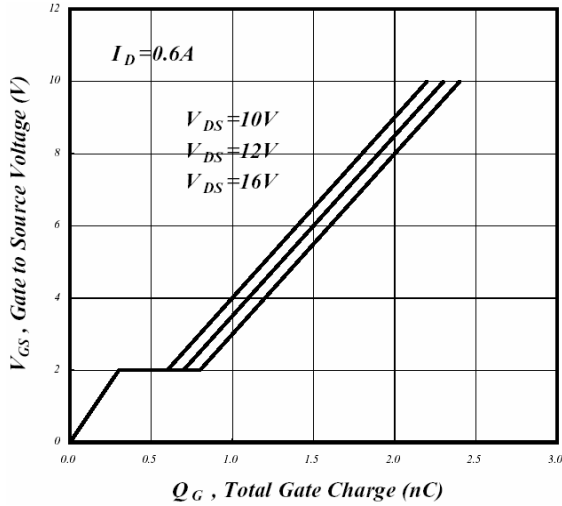


Fig 7. Gate Charge Characteristics

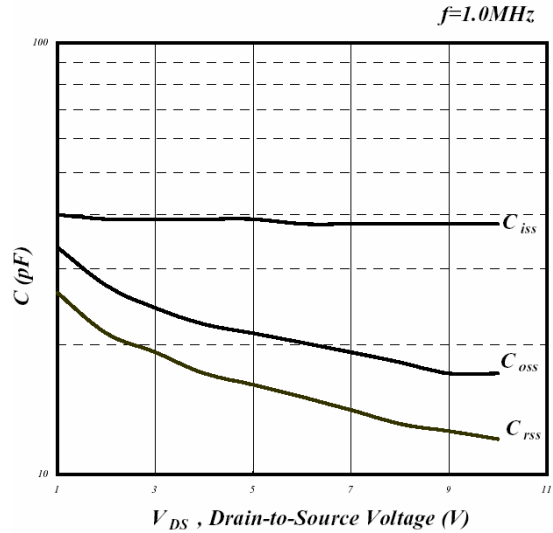


Fig 8. Typical Capacitance Characteristics

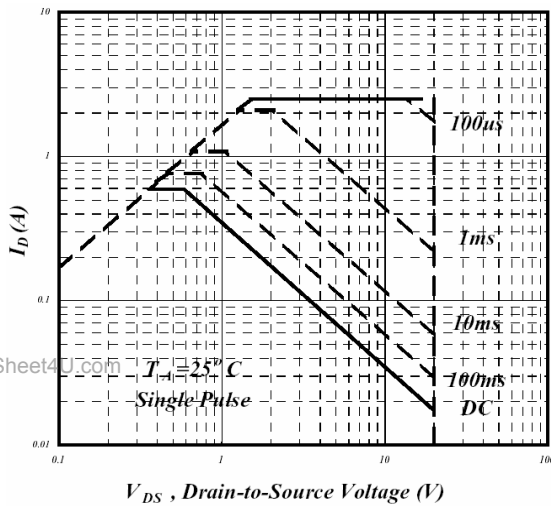


Fig 9. Maximum Safe Operating Area

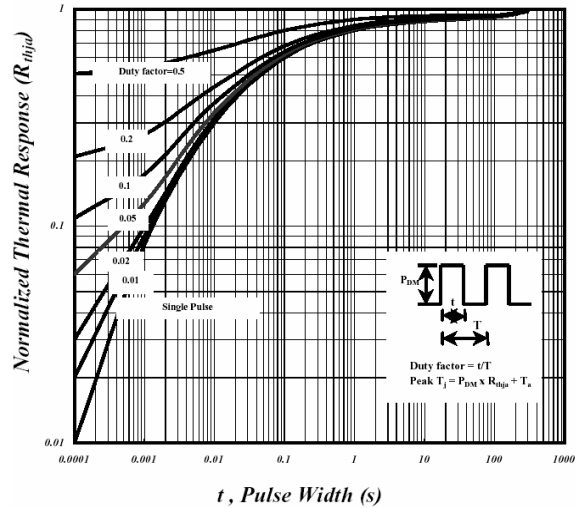


Fig 10. Effective Transient Thermal Impedance

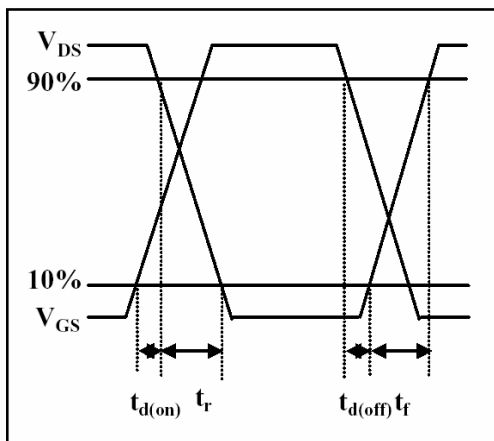


Fig 11. Switching Time Waveform

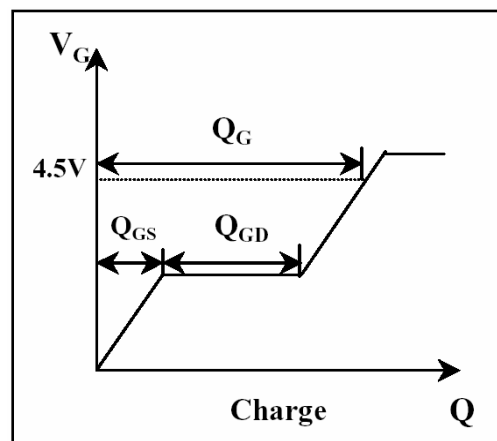


Fig 12. Gate Charge Waveform