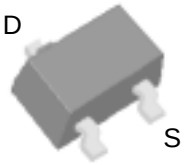
P-channel Enhancement-mode Power MOSFET

PRODUCT SUMMARY

BV_{DSS}	-20V
$R_{DS(ON)}$	600mΩ
I_D	-550mA

Pb-free; RoHS-compliant SOT-323/SC-70



SOT-323/SC-70

DESCRIPTION

The SSM1333GU acheives fast switching performance with low gate charge without a complex drive circuit. It is suitable for low voltage applications such as drivers, high-side line and general load-switching circuits.

The SSM1333GU is supplied in an RoHS-compliant SOT-323/SC-70 package, which is widely used for low power commercial and industrial surface mount applications.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Units
V_{DS}	Drain-source voltage	-20	V
V_{GS}	Gate-source voltage	± 12	V
I_D	Continuous drain current [3], T_A = 25°C	-550	mA
	T_A = 70°C	-440	mA
I_{DM}	Pulsed drain current [1,2]	-2.5	A
P_D	Total power dissipation [3], T_A = 25°C	0.35	W
	Linear derating factor	0.003	W/°C
T_{STG}	Storage temperature range	-55 to 150	°C
T_J	Operating junction temperature range	-55 to 150	°C

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Units
$R_{\Theta JA}$	Maximum thermal resistance, junction-ambient[3]	360	°C/W

Notes:

1.Pulse width must be limited to avoid exceeding the maximum junction temperature of 150°C.

2.Pulse width <300us, duty cycle <2%.

3.Mounted on FR4 board, t < 10 sec.

ELECTRICAL CHARACTERISTICS (at Tj = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	VGS=0V, ID=-250uA	-20	-	-	V
$\Delta BV_{DSS}/\Delta Tj$	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I_D=-1mA	-	0.01	-	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-550mA	-	-	600	mΩ
		V_{GS}=-4.5V, I_D=-500mA	-	-	800	mΩ
		V_{GS}=-2.5V, I_D=-300mA	-	-	1000	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.5	-	-1.2	V
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-500mA	-	1	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V, V_{GS}=0V	-	-	-1	uA
		V_{DS}=-16V ,V_{GS}=0V, Tj=70°C	-	-	-10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±12V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=-500mA	-	1.7	2.7	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-16V	-	0.3	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	0.4	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-10V	-	5	-	ns
t_r	Rise Time	I_D=-500mA	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω , V_{GS}=-5V	-	10	-	ns
t_f	Fall Time	R_D=20Ω	-	2	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	66	105.6	pF
C_{oss}	Output Capacitance	V_{DS}=-10V	-	25	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	20	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Forward On Voltage[2]	I_S=-300mA, V_{GS}=0V	-	-	-1.2	V

Notes:

1.Pulse width must be limited to avoid exceeding the maximum junction temperature of 150°C.

2.Pulse width <300us, duty cycle <2%.

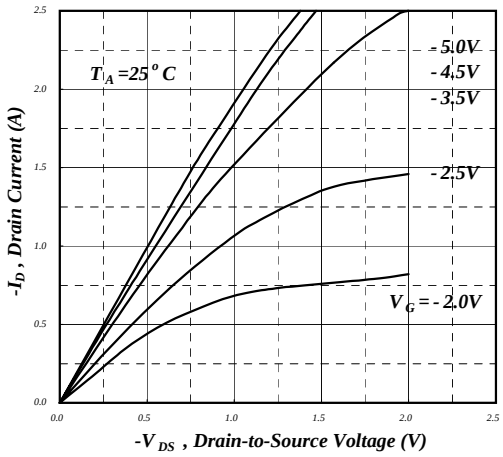


Fig 1. Typical output characteristics

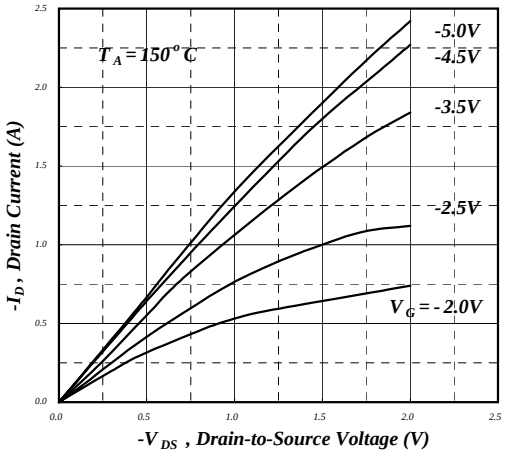


Fig 2. Typical output characteristics

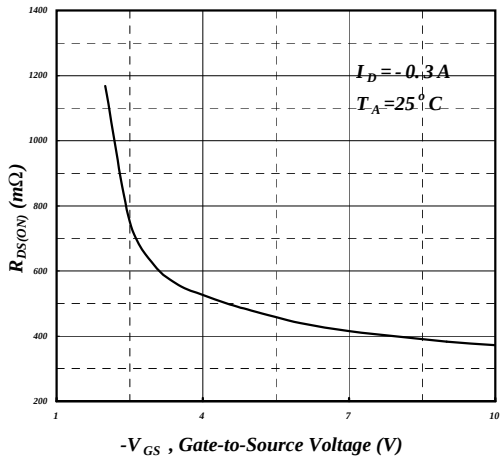


Fig 3. On-resistance vs. gate voltage

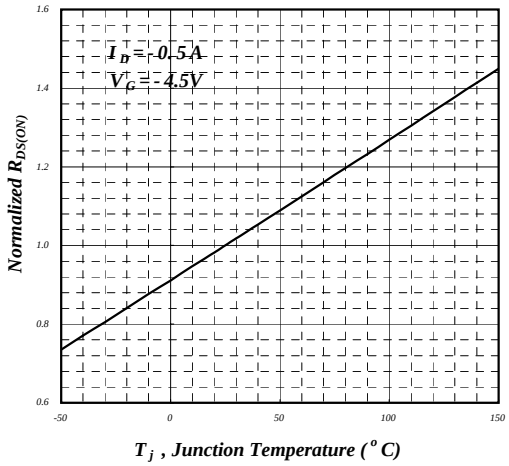


Fig 4. Normalized on-resistance vs. junction temperature

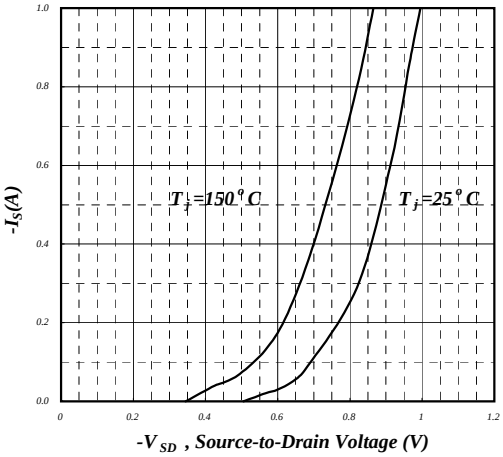


Fig 5. Forward characteristics of the reverse diode

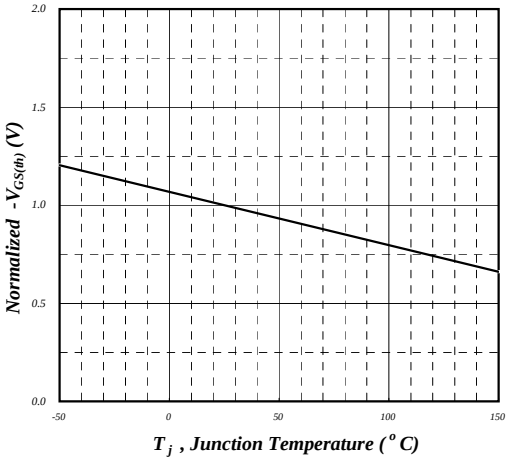


Fig 6. Gate threshold voltage vs. junction temperature

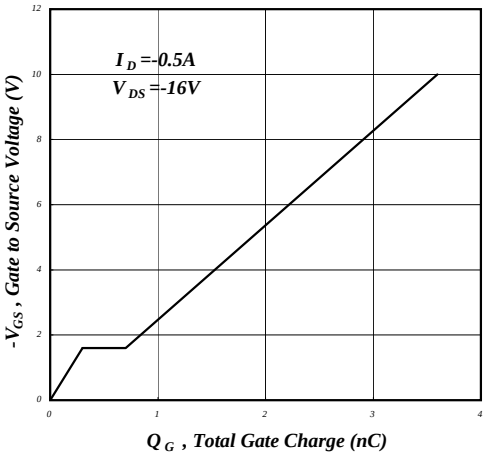


Fig 7. Gate charge characteristics

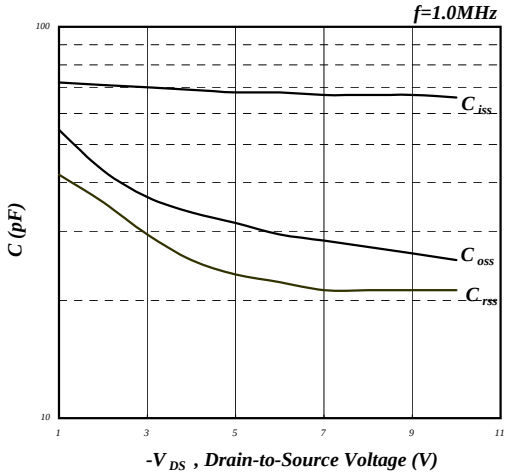


Fig 8. Typical capacitance characteristics

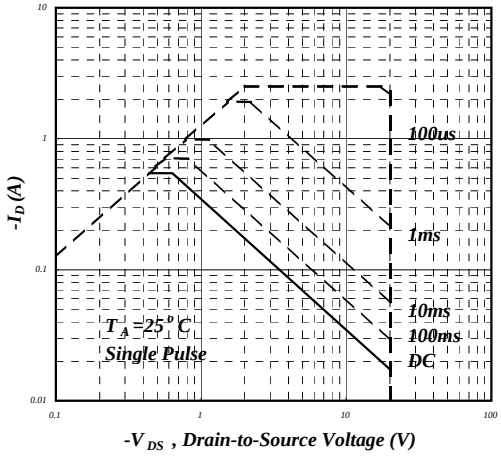


Fig 9. Maximum safe operating area

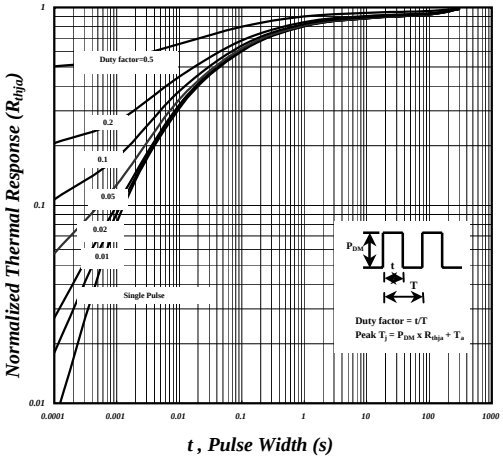


Fig 10. Effective transient thermal impedance

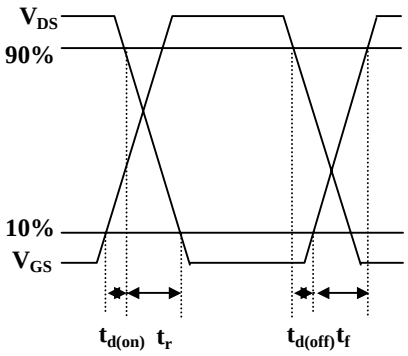


Fig 11. Switching time waveform

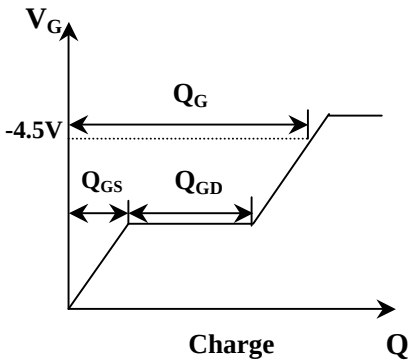
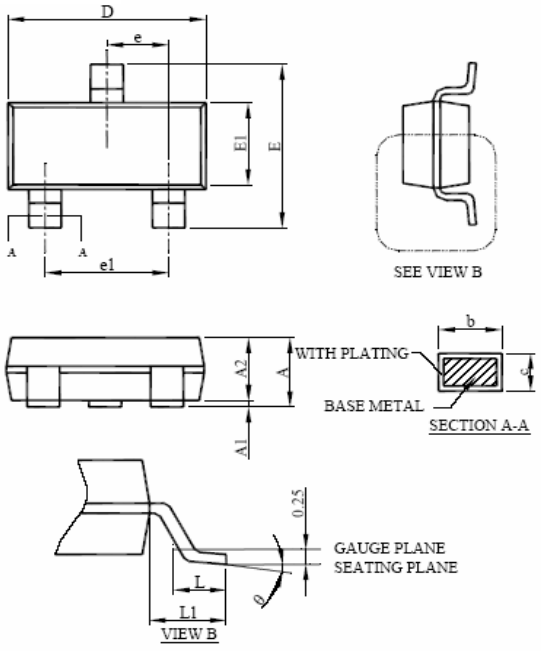


Fig 12. Gate charge waveform

PHYSICAL DIMENSIONS

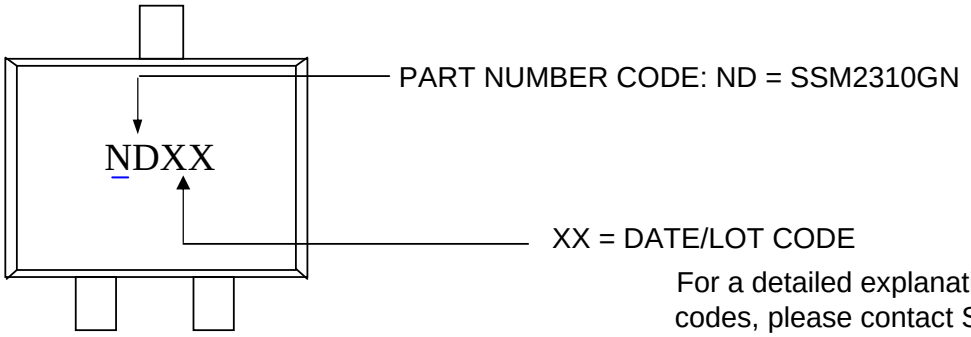
SOT-23-3



SYMBOL	SOT-23-3	
	MILLIMETERS	
	MIN.	MAX.
A	0.89	1.45
A1	0	0.15
A2	0.70	1.30
b	0.30	0.50
c	0.08	0.25
D	2.65	3.10
E	2.10	3.00
E1	1.19	2.30
e	0.95BSC	
e1	1.90BSC	
L	0.30	0.60
L1	0.60REF	
Θ	0°	8°

*Dimensions do not include mold protrusions.

PART MARKING



For a detailed explanation of these codes, please contact SSC directly.

PACKING: Moisture sensitivity level MSL3

3000 pcs in antistatic tape on a reel packed in a moisture barrier bag (MBB).