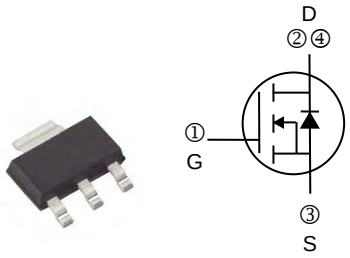
V_{DSS}	60 V
I_D	5.0 A
$R_{DS(ON)}$	36mΩ

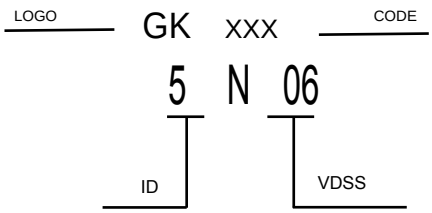
Features

Advanced High Cell Density Trench Technology
Super Low Gate Charge
Green Device Available



SOT223 Pin Configuration





MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_A=25°C	I_D	5	A
	T_A=70°C		4	A
Pulsed Drain Current [3]		I_{DM}	14	A
Power Dissipation	T_A=25°C	P_D	1.5	W
Operating Junction & Storage Temperature		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Ambient [2]		$R_{\theta JA}$	125	
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	50	

Electrical Characteristics T_A=25℃ unless otherwise s ecified

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	60	-	-	V	V_{GS}=0, I_D=250μA
Breakdown Voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	-	0.063	-	V/°C	Reference to 25°C, I_D=1mA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transfer Conductance		g_{fs}	-	20	-	S	V_{DS}=5V, I_D=5A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	mA	V_{DS}=48V, V_{GS}=0
	T_J=55°C		-	-	5		V_{DS}=48V, V_{GS}=0
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	36	mΩ	V_{GS}=10V, I_D=5A
			-	-	45		V_{GS}=4.5V, I_D=2.5A
Total Gate Charge		Q_g	-	11.74	-	nC	I_D=5A V_{DS}=48V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	4.35	-		
Gate-Drain Change		Q_{gd}	-	4.12	-		
Turn-on Delay Time		$T_{d(on)}$	-	5.5	-	nS	V_{DD}=30V I_D=5A V_{GS}=10V R_G=3.3Ω R_L=6Ω
Rise Time		T_r	-	21.2	-		
Turn-off Delay Time		$T_{d(off)}$	-	20.7	-		
Fall Time		T_f	-	16	-		
Input Capacitance		C_{iss}	-	1231	-	pF	V_{GS}=0 V_{DS}=25V f=1MHz
Output Capacitance		C_{oss}	-	109	-		
Reverse Transfer Capacitance		C_{rss}	-	17	-		
Source-Drain Diode							
Continuous Source Current [1]		I_S	-	5	-	A	
Pulsed Source Current [3]		I_{SM}	-	14	-		
Diode Forward Voltage [4]		V_{SD}	-	-	1.2	V	I_S=1.6A, V_{GS}=0

Notes:

1. Surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. When mounted on Min. copper pad.
3. The power dissipation is limited by 150°C junction temperature.
4. The data tested by pulsed, pulse width≦ 300us, duty cycle≦ 2%.

RATING AND CHARACTERISTIC CURVES

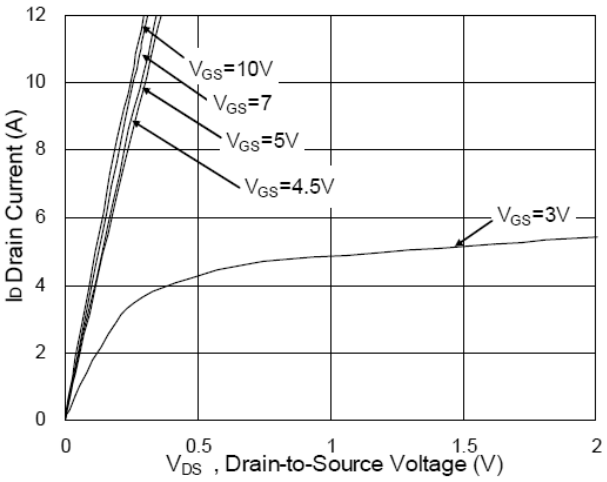


Fig.1 Typical Output Characteristics

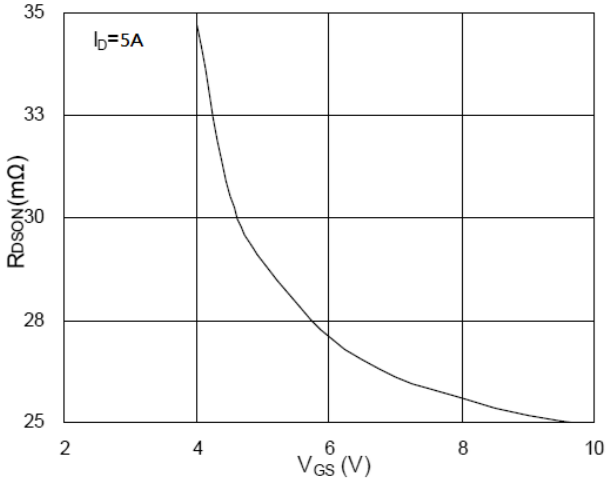


Fig.2 On-Resistance v.s Gate-Source

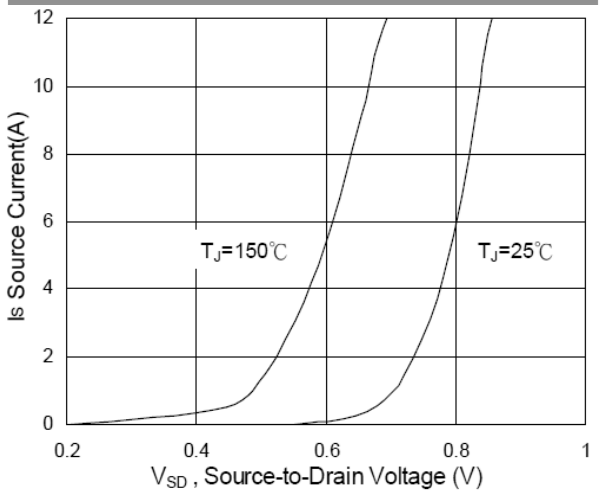


Fig.3 Forward Characteristics of Reverse

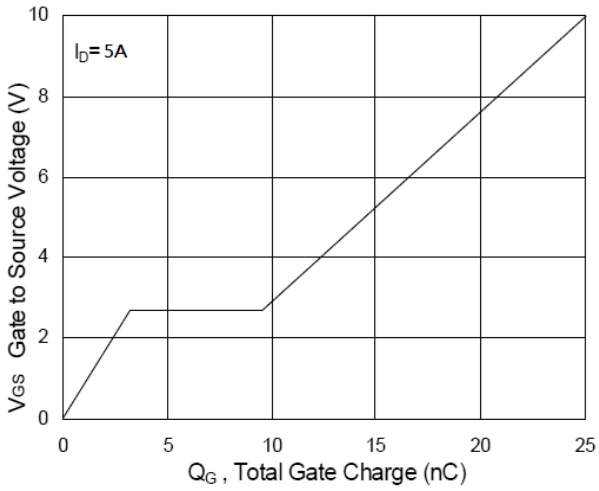


Fig.4 Gate-Charge Characteristics

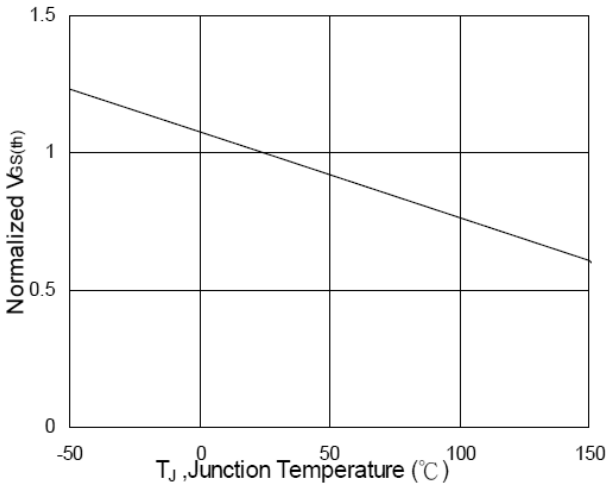


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

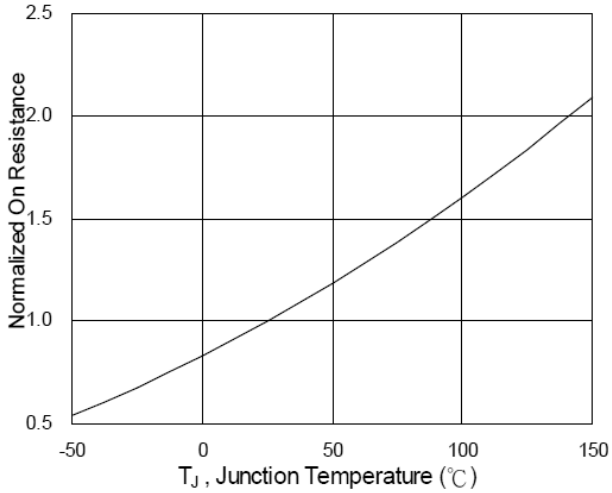


Fig.6 Normalized R_{DSON} v.s T_J

RATING AND CHARACTERISTIC CURVES

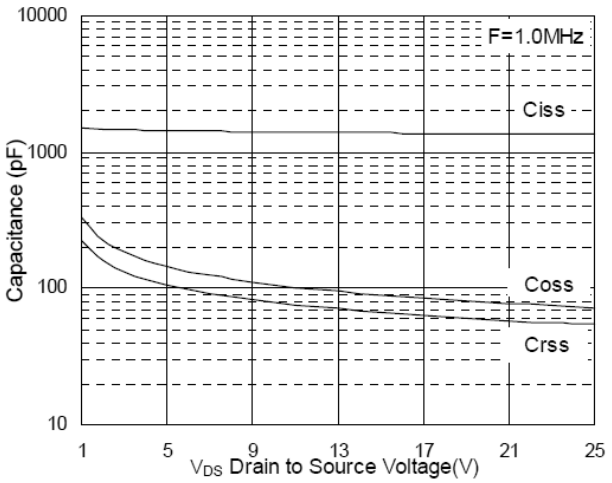


Fig.7 Capacitance

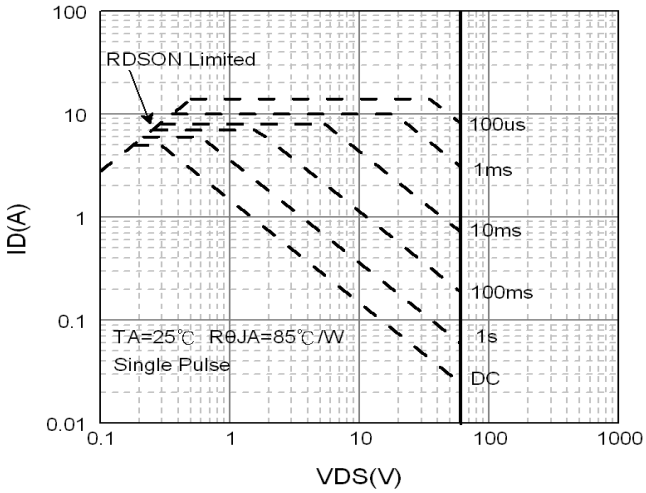


Fig.8 Safe Operating Area

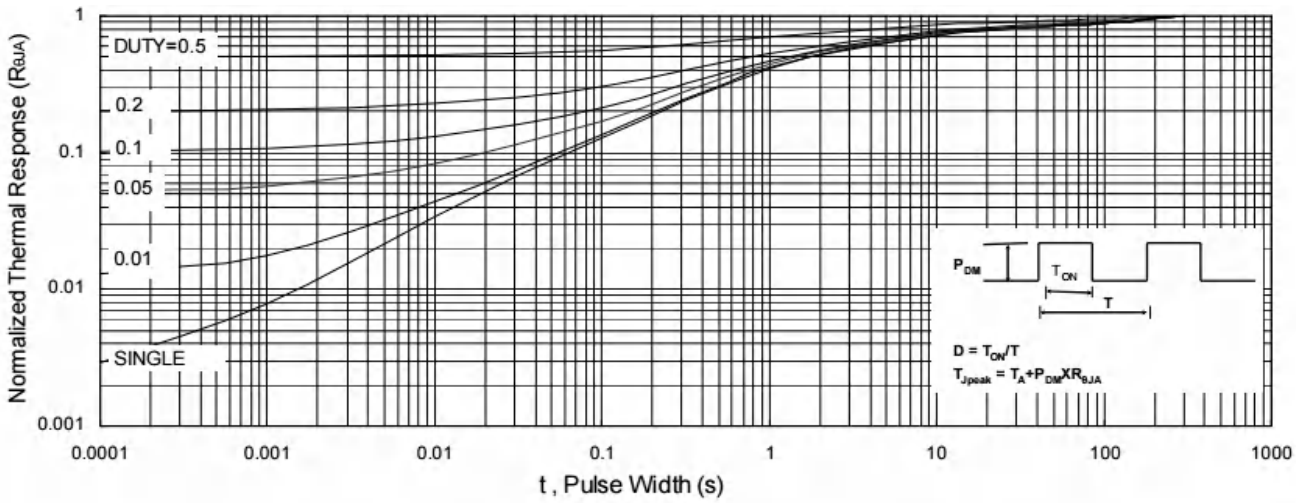


Fig.9 Normalized Maximum Transient Thermal Impedance

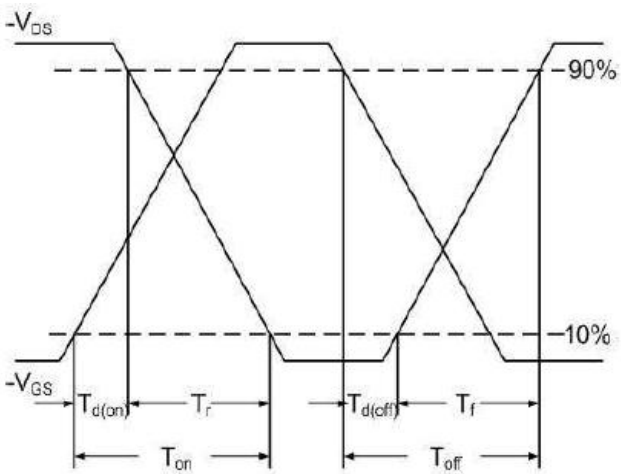


Fig.10 Switching Time Waveform

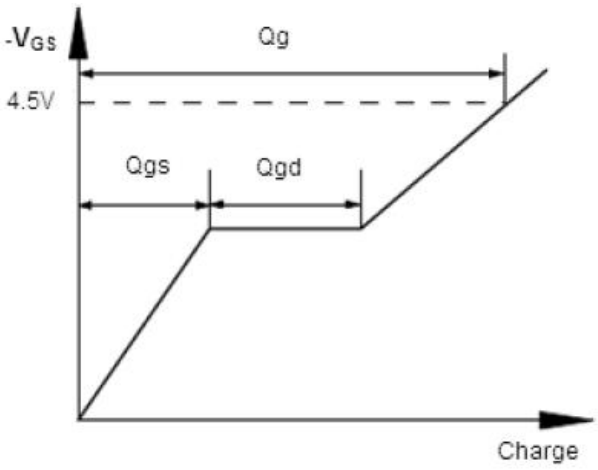
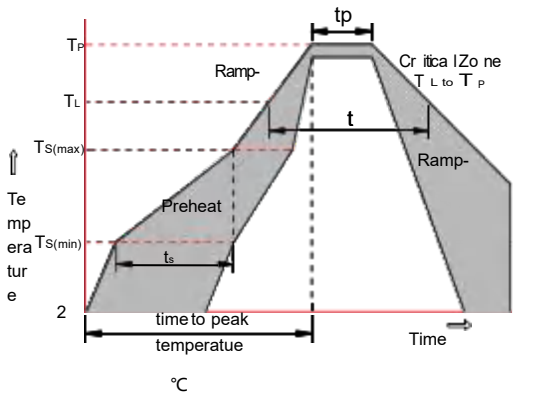


Fig.11 Gate Charge Waveform

Soldering parameters

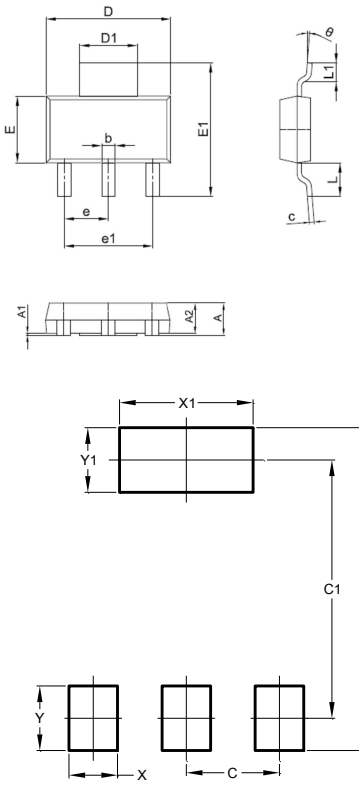
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOT-223

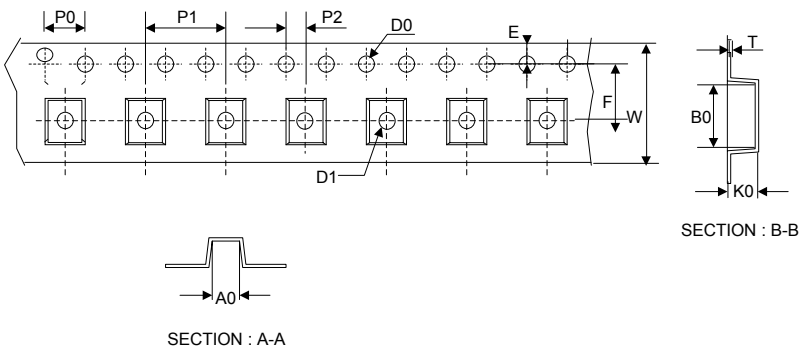


Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.50	1.80	0.059	0.071
A1	0.00	0.10	0.000	0.004
A2	1.50	1.70	0.059	0.067
b	0.65	0.75	0.026	0.030
c	0.20	0.30	0.008	0.012
D	6.40	6.60	0.252	0.260
D1	2.90	3.10	0.114	0.122
E	3.30	3.70	0.130	0.146
E1	6.85	7.15	0.270	0.281
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	1.65	1.85	0.065	0.073
L1	0.90	1.15	0.035	0.045

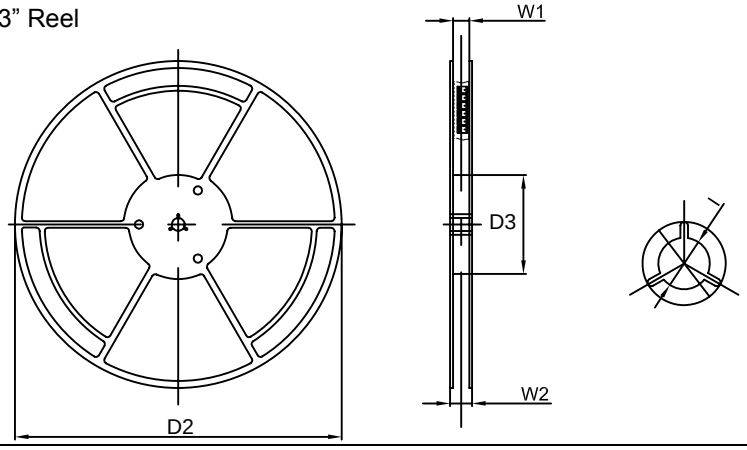
Dimensions	Value (in mm)
C	2.30
C1	6.00
X	1.20
X1	3.60
Y	1.70
Y1	1.70
Y2	7.70

Tape & rell specification

Tape



13” Reel



Symbol	Dimension (mm)
P0	4.00±0.20
P1	8.00±0.20
P2	2.00±0.20
D0	1.55±0.20
D1	1.55±0.20
E	1.75±0.20
F	5.50±0.20
W	12.00±0.20
A0	7.40±0.20
B0	7.50±0.20
K0	2.10±0.20
T	0.20±0.20
D2	330.0±5.0
D3	100.0±4.0
W1	18.0±5.0
W2	22.0±5.0
I	13.0±2.0

Quantity: 2500PCS