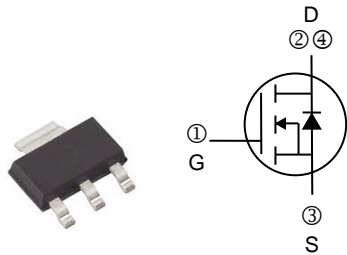


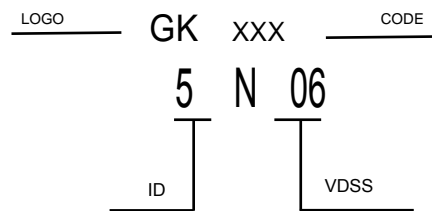
Features

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

V_{DS} 60 V
 I_D 5.0 A
 $R_{DS(ON)}$ 36m Ω



SOT223 Pin Configuration



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 @ $V_{GS}=10\text{V}$	I_D	$T_A=25^\circ\text{C}$	5	A
		$T_A=70^\circ\text{C}$	4	A
Pulsed Drain Current ³	I_{DM}	14	A	
Power Dissipation	P_D	1.5	W	
Operating Junction & Storage Temperature	T_J, T_{STG}	-55~150	$^\circ\text{C}$	
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	85	$^\circ\text{C/W}$	
Thermal Resistance Junction-Ambient ²	$R_{\theta JA}$	125		
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	50		

Electrical Characteristics T_A=25°C unless otherwise specified

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	ΔBV _{DSS} /ΔT _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	I _{DSS}	T _J =25°C	-	-	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 inch² 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

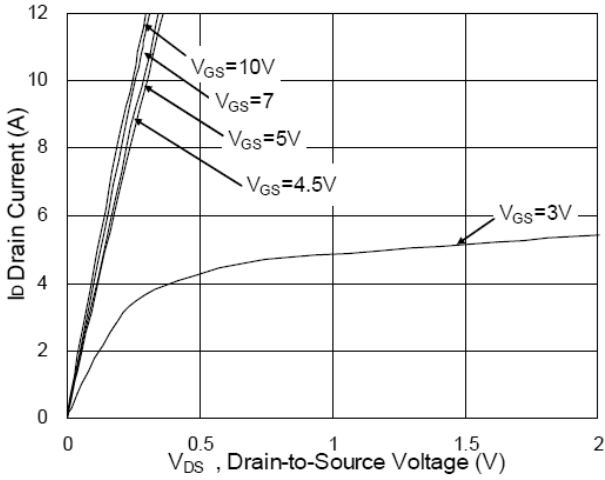


Fig.1 Typical Output Characteristics

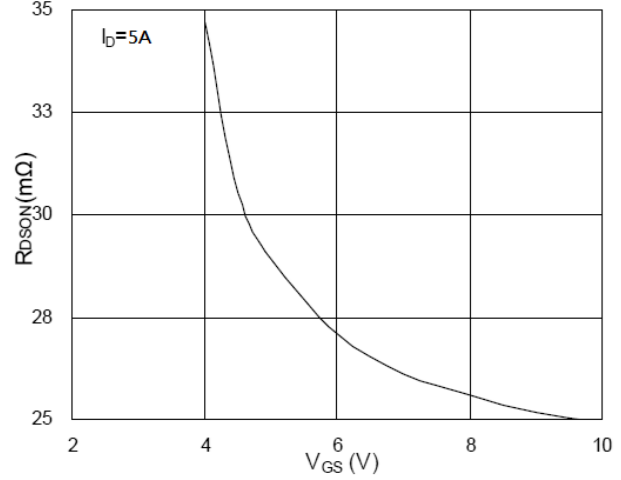


Fig.2 On-Resistance v.s Gate-Source

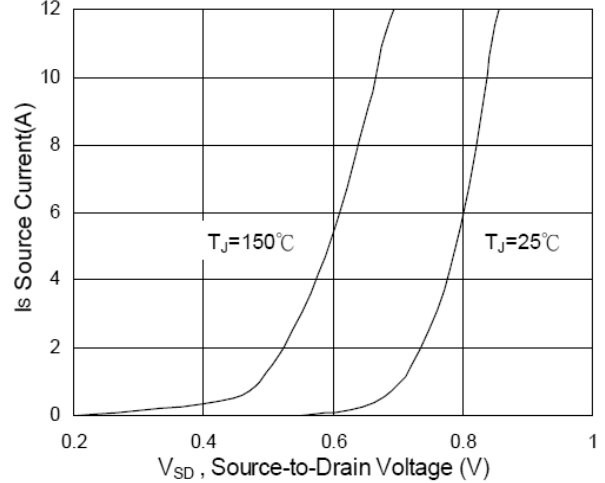


Fig.3 Forward Characteristics of Reverse

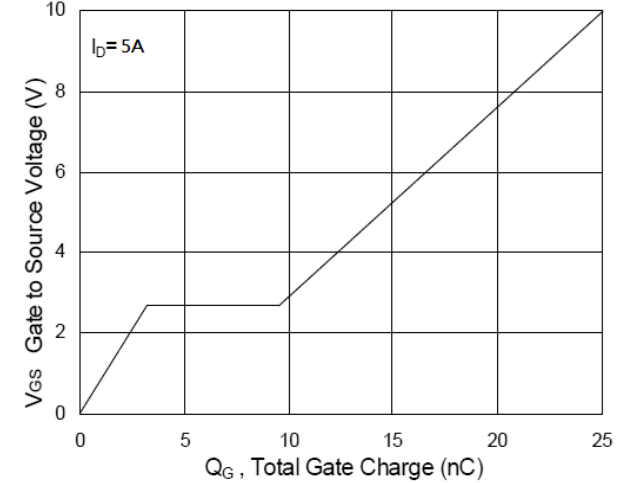


Fig.4 Gate-Charge Characteristics

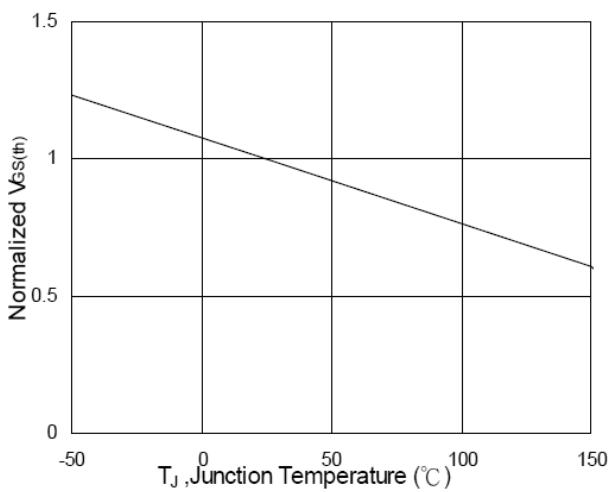


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

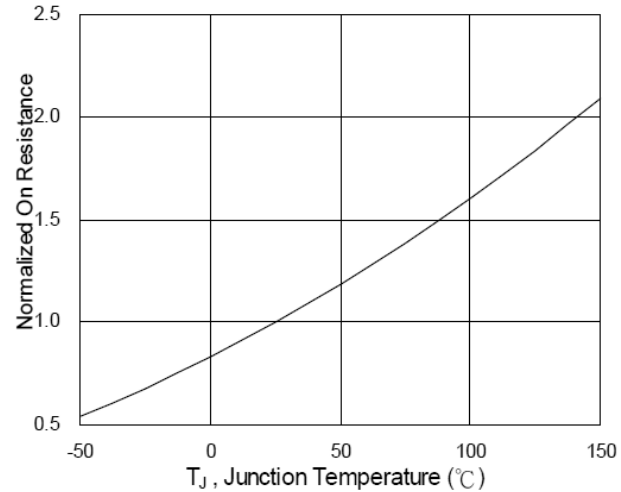


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

RATING AND CHARACTERISTIC CURVES

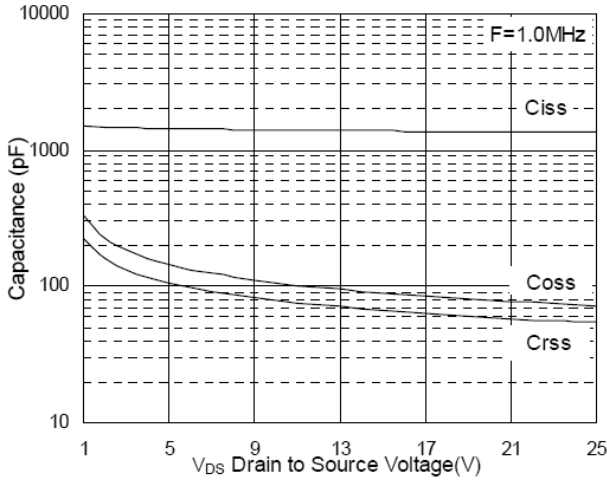


Fig.7 Capacitance

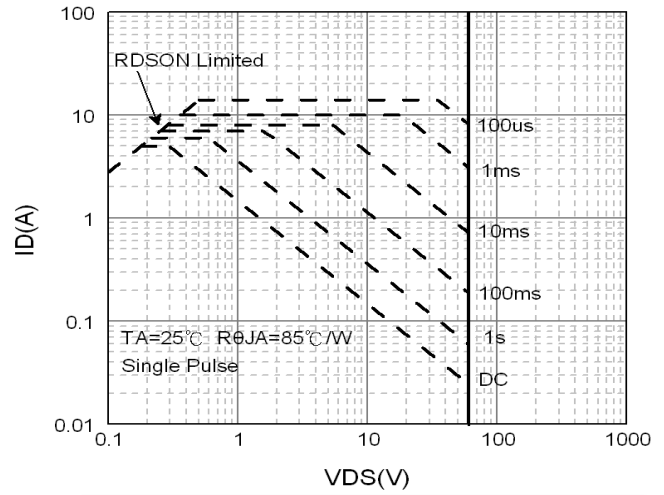


Fig.8 Safe Operating Area

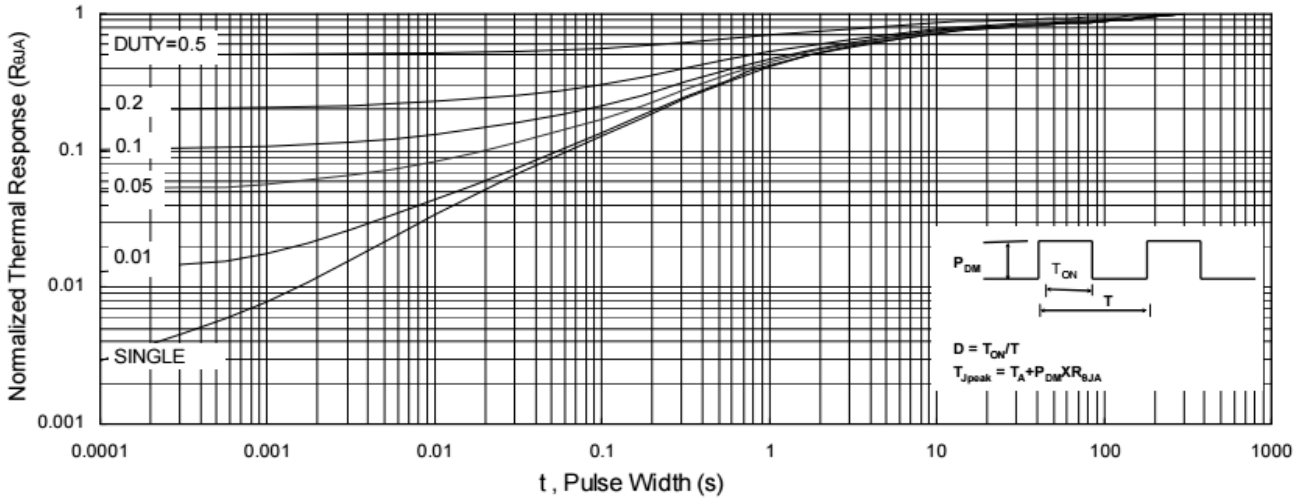


Fig.9 Normalized Maximum Transient Thermal Impedance

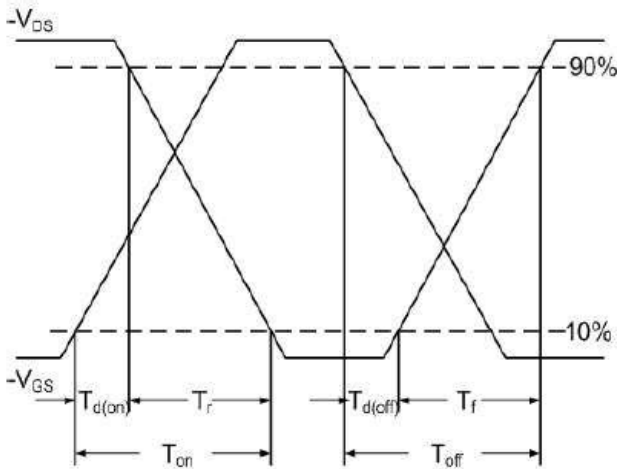


Fig.10 Switching Time Waveform

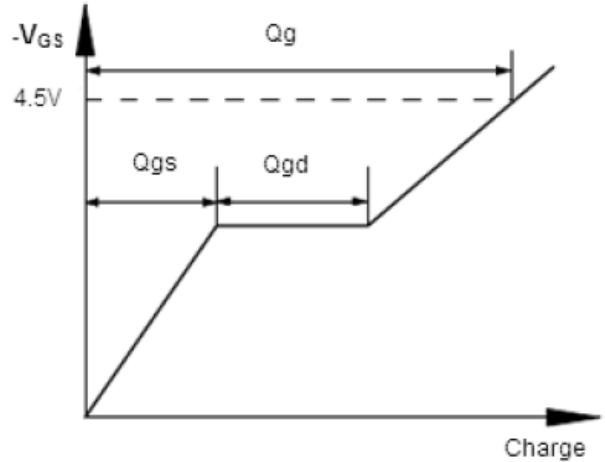


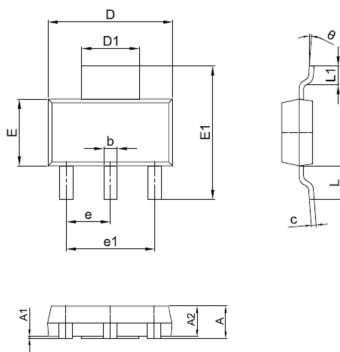
Fig.11 Gate Charge Waveform

Soldering parameters

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

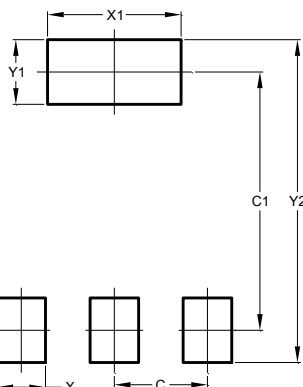


Package Dimensions & Suggested Pad Layout



SOT-223

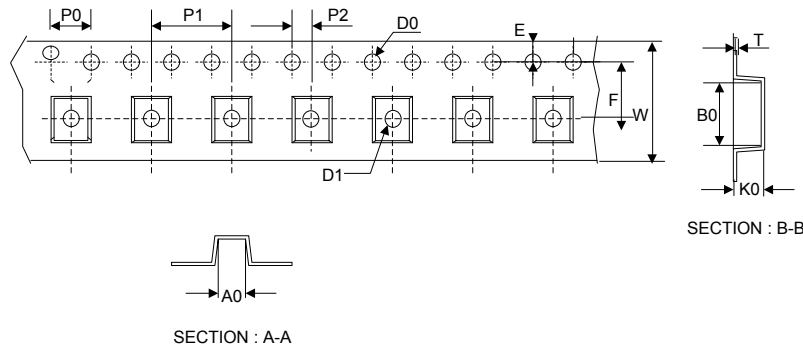
Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.50	1.80	0.059	0.071
A1	0.00	0.10	0.000	0.004
A2	1.50	1.70	0.059	0.067
b	0.65	0.75	0.026	0.030
c	0.20	0.30	0.008	0.012
D	6.40	6.60	0.252	0.260
D1	2.90	3.10	0.114	0.122
E	3.30	3.70	0.130	0.146
E1	6.85	7.15	0.270	0.281
e	2.20	2.40	0.087	0.094
e1	4.40	4.80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

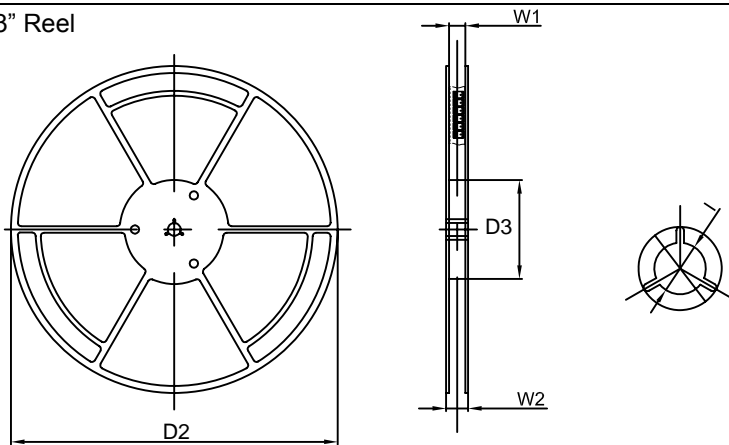
Tape & reel specification

Tape



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

13" Reel



Quantity: 2500PCS