

SPECIFICATION SHEET NO.	S0508- 2N7002KS0S702K	
ORIGINAL MFG/PART NO.	MDD Diodes/2N7002KS	
NEXTGEN PART CODE	2N7002KS0S702K	Indicate This Code For RFQ /Order
DATE	May 8, 2025	
REVISION	A4	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	SMD Plastic-Encapsulate MOSFETS Case SOT-23 2N7 Series, 3 Pads N-Channel Enhancement Model Drain-Source Voltage (V_{DS}): 60V. Continuous Drain Current (I_D): 0.3A Power Dissipation (P_D): 0.3W Max. Junction Temperature and Storage Temperature: -50°C ~+150°C Package in Tape/Reel, 3000pcs/Reel RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER		
MEMO		

VENDOR APPROVE
Issued/Checked/Approved   
Effective Date: May 8, 2025

CUSTOMER APPROVE
Date:

MAIN FEATURE

- Trench Power MV MOSFET Technology
- Voltage Controlled Small Signal Switch
- Low input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage
- ESD Protected up to 2KV(HBM)
- Surface Mount Package Ideally Suited for Automatic Insertion
- Meet MSL 1 Requirement
- Cross Competitors Parts and More.
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)

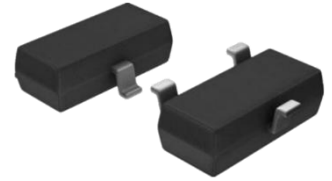


Image shown is a representation only. Exact specifications should be obtained from the product dimension.



APPLICATION

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

ELECTRICAL CHARACTERISTICS

- See Page 5 ~Page 7
- All Parameters are Subject To NextGen Components' Final Confirmation

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code 2N7002KS0S702K For RFQ and Order.

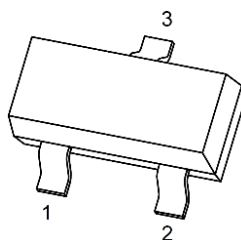
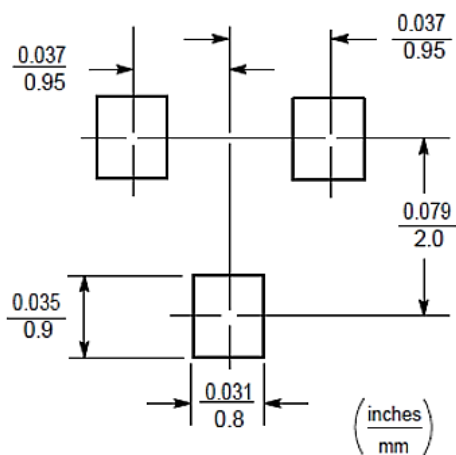
PART CODE GUIDE

RFQ

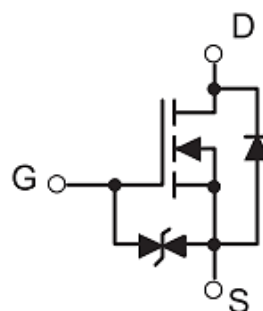
[Request For Quotation](#)

CODE	NAME	KEY SPECIFICATION OPTION
2N7	Product Series Code	SMD Plastic-Encapsulate MOSFETS Case SOT-23 2N7 Series, 3 Pads
002KS	Parameters Code	Letter or Digits (A~Z, a~z or 0~9)
0S	Internal Control Code	Letter or Digits (A~Z, a~z or 0~9)
702K	Marking Code	Marking "702K"
XX	Special/Custom Parameters Code	Letter or Digits (A~Z, a~z or 0~9) for Special Parametric; Blank: N/A

RECOMMEND PAD LAYOUT - Unit: mm, Tol. ±0.05mm.



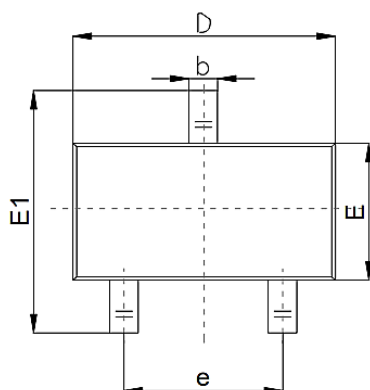
1. Gate (G) 2. Source (S) 3. Drain (D)



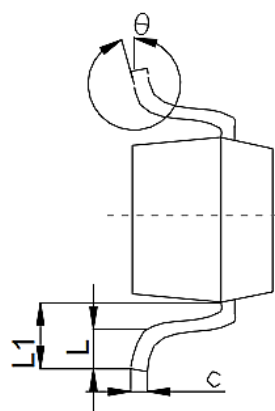
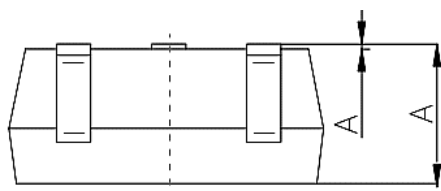
Equivalent Circuit

DIMENSION- Unit: mm, Case SOT-23 Outline

Top View



Side View



SYMBOL	DIMENSION (MM)		
	MIN.	TYP.	MAX.
A	0.65		1.40
A1	0.00		0.20
b	0.30		0.55
c	0.08		0.20
D	2.70		3.10
E	1.15		1.65
E1	2.10		2.80
e	1.70		2.10
L	0.15		0.50
L1	0.35		0.70
θ	0°		12°

60V N-CHANNEL MODE MOSFET

V(BR)DSS	RDS(on) Typ.	ID Max.
60V	2.5Ω @10V	0.3A
	3.0Ω @4.5V	0.3A

ABSOLUTE MAXIMUM RATINGS - AT Ta=25 °C , unless otherwise specified

PARAMETERS	SYMBOL	VALUE	UNITS
Drain-Source Voltage	VDS	60	V
Gate-Source Voltage	VGS	±20	V
Continuous Drain Current (See Page 7 Note 1)	ID	0.3	A
Power Dissipation (See Page 7 Note 2)	PD	0.3	W
Thermal Resistance from Junction to Ambient (See Page 7 Note 2)	RθJA	416	°C/W
Junction Temperature and Storage Temperature	TJ TSTG	-50 ~ +150	°C

Notes:

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

MOSFET STATIC CHARACTERISTICS - AT Ta=25 °C unless otherwise specified

PARAMETER	SYMBOL	VALUE			UNIT	CONDITION
		MIN.	TYP.	MAX.		
Drain-source Breakdown Voltage	V(BR)DSS	60	-	-	V	VGS=0V, ID= 250μA
Drain-Source Leakage Current	IDSS	-	-	1.0	μA	VDS= 60V, VGS=0V
Gate-Source Leakage Current	IGSS	-	-	±10	nA	VGS=±20V, VDS=0V
Gate threshold Voltage	VGS(TH)	1	1.5	2.5	V	VDS= VGS, ID= 250μA
Drain-Source On-State Resistance (See Page 7 Note 3)	RDS(ON)	-	1.9	2.5	Ω	VGS= 10V, ID= 0.3A
		-	2.0	3.0		VGS= 4.5, ID= 0.2A
		-	-	-		

DYNAMIC ELECTRICAL CHARACTERISTICS - AT Ta=25 °C unless otherwise specified

PARAMETER	SYMBOLS	VALUE			UNIT	CONDITION
		MIN.	TYP.	MAX.		
Input Capacitance	Ciss	-	21	-	pF	VDS= 30V VGS=0V f=1MHz
Output Capacitance	Coss	-	9	-	pF	
Reverse Transfer Capacitance	Crss	-	4	-	pF	
Total Gate Charge	Qg	-	1.22	-2.4	nC	VDS= 30V VGS= 10V ID= 0.3A
Gate Source Charge	Qgs	-	0.5	-	nC	
Gate Drain Charge	Qgd	-	0.18	-	nC	

SWITCHING CHARACTERISTICS - AT Ta=25 °C unless otherwise specified

PARAMETER	SYMBOLS	VALUE			UNIT	CONDITION
		MIN.	TYP.	MAX.		
Turn on Delay Time	td(on)	-	7	-	ns	VDS=30V VGS= 10V ID= 0.3A RG = 6.0Ω
Turn on Rise Time	tr	-	19	-	ns	
Turn Off Delay Time	td(off)	-	20	-	ns	
Turn Off Fall Time	tf	-	84	-	ns	

SOURCE DRAIN DIODE CHARACTERISTICS - AT Ta=25 °C unless otherwise specified

PARAMETER	SYMBOLS	VALUE			UNIT	CONDITION
		MIN.	TYP.	MAX.		
Source drain current (Body Diode)	ISD	-	-	0.3	A	Ta=25 °C
Drain-Source Diode Forward Voltage	VSD	-	-	1.2	V	VGS=0V, ISD= 0.3A

Notes

1. Pulse width limited by maximum allowable junction temperature
2. The value of PD & RθJA is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, double sided, in a still air environment with Ta=25°C.
3. Pulse test: Pulse width ≤ 300μs, duty cycle ≤2%

RATINGS AND CHARACTERISTICS CURVES - For Reference Only, $T_a=25^{\circ}\text{C}$ Unless Otherwise Specified.

Figure 1. Output Characteristics

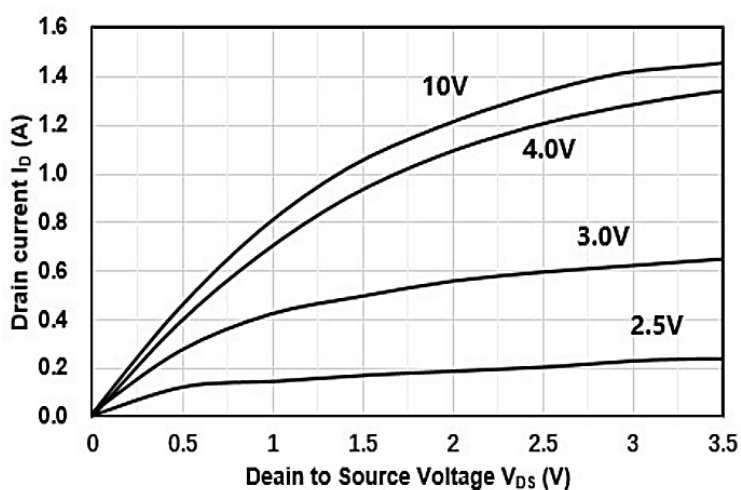
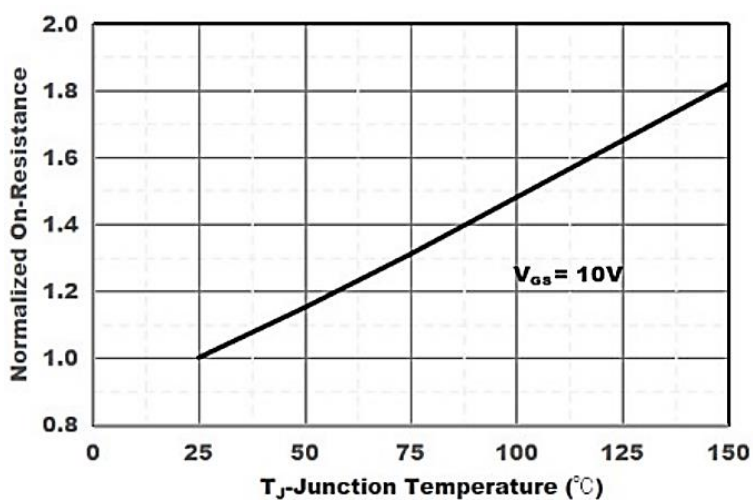


Figure 2. Drain-Source on Resistance



RATINGS AND CHARACTERISTICS CURVES- For Reference Only, $T_a=25^{\circ}\text{C}$ Unless Otherwise Specified.

Figure 3. Transfer Characteristics

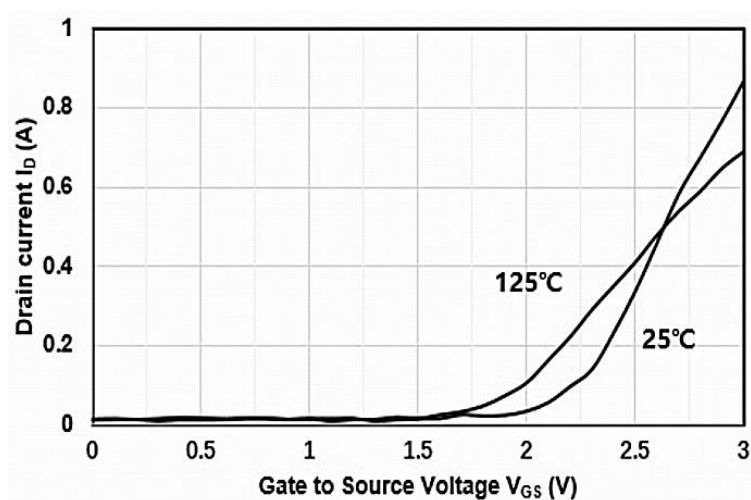
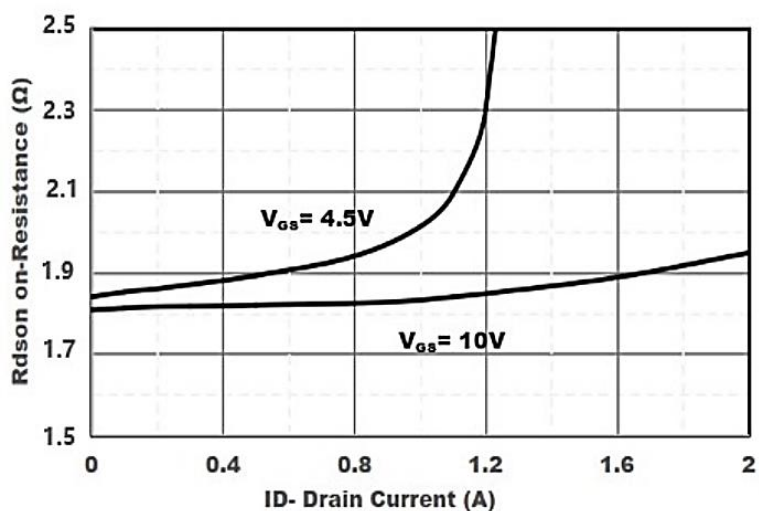


Figure 4. Drain-Source on Resistance



RATINGS AND CHARACTERISTICS CURVES- For Reference Only, $T_a=25^{\circ}\text{C}$ Unless Otherwise Specified.

Figure 5. Capacitance Vs. Drain-Source Voltage

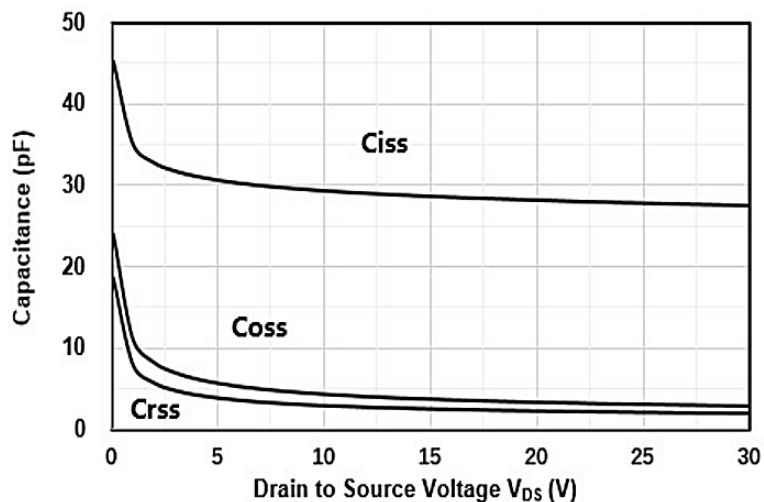
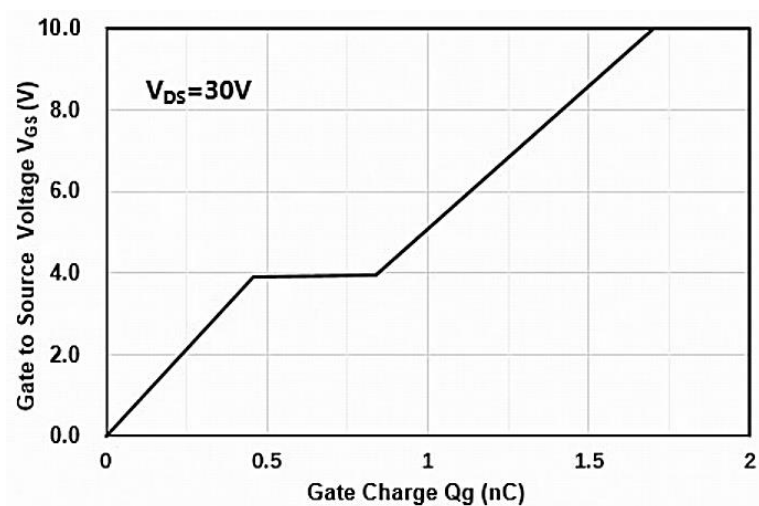


Figure 6. Gate Charge Vs. Gate-Source Voltage



RATINGS AND CHARACTERISTICS CURVES- For Reference Only, Ta=25°C Unless Otherwise Specified.

Figure 7. Safe Operating Area

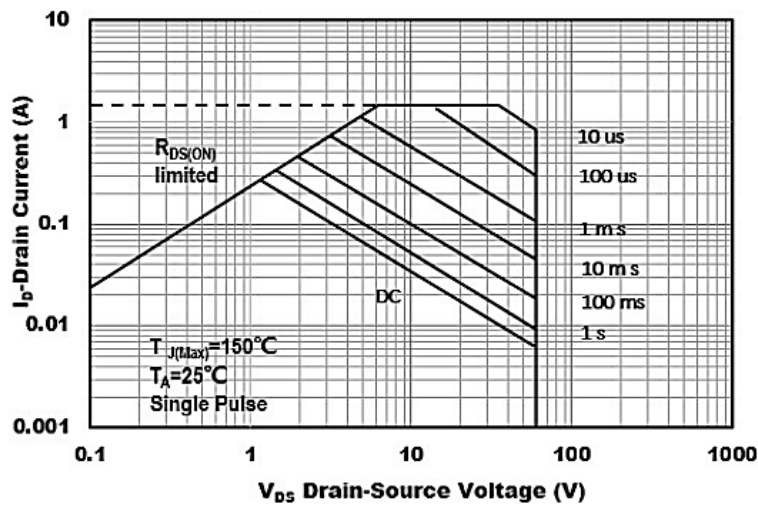
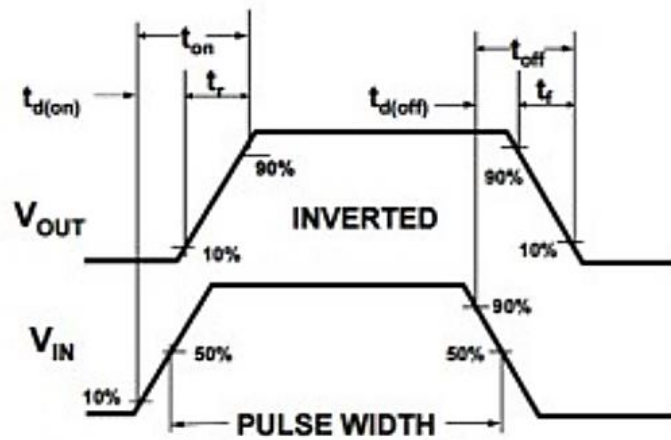
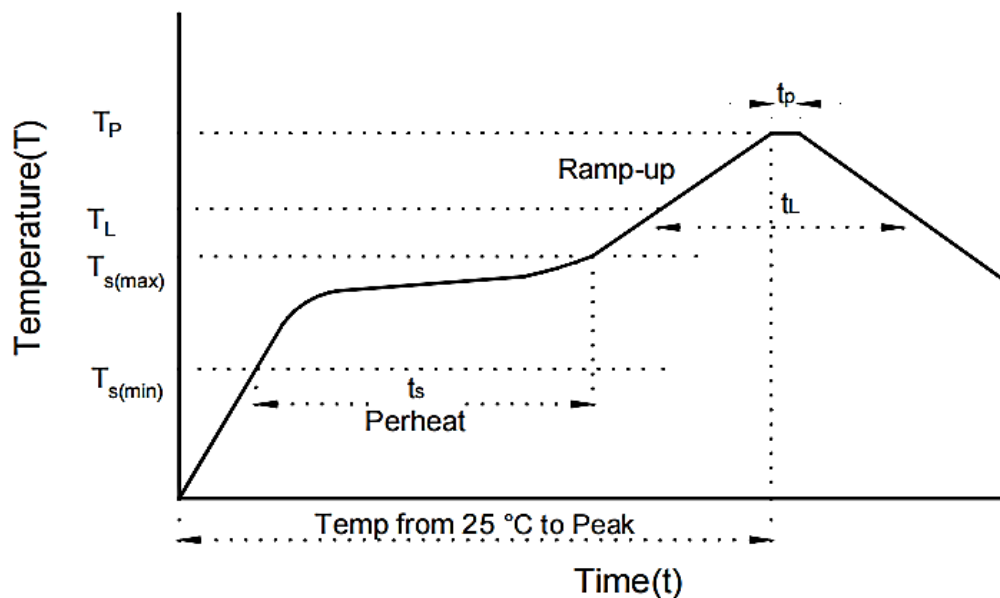


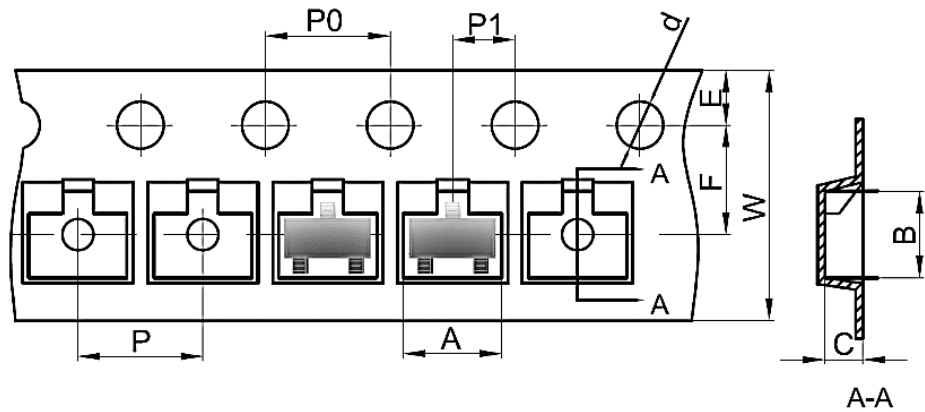
Figure 8. Switching Waveforms



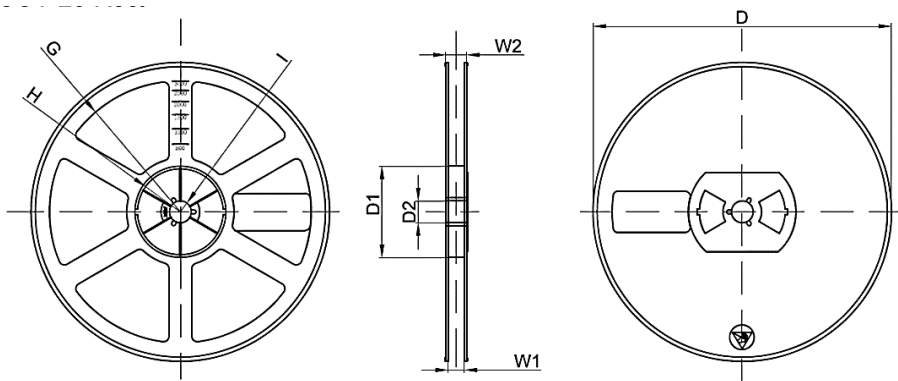
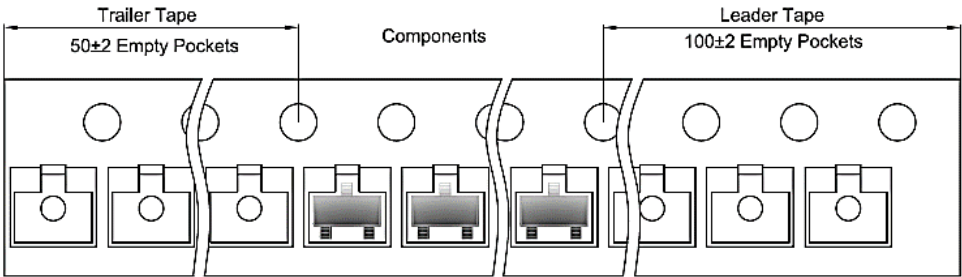
RECOMMENDED SOLDERING PARAMETERS – FOR REFERENCE ONLY


PROFILE FEATURE		PB-FREE ASSEMBLY
Average Ramp-up Rate (T_L Max to T_p)		3°C/second Max
Preheat	Temperature Min (T_s Min.)	150°C
	Temperature Max (T_s Max.)	200°C
	Time (t_s Min. to t_s Max.)	60 ~ 180 seconds
Time maintained above	Temperature (T_L)	217°C
	Time (t_L)	60 ~ 150 seconds
Peak/Classification Temperature (T_p)		260 °C
Time within 5°C of actual Peak Temperature (t_p)		10 seconds Max.
Ramp-down Rate		6 °C /Second Max.
Time 25 °C to Peak Temperature		8 Minutes Max.
Suggest reflow times		3 Times Max.

TAPE/REEL - Unit: mm, All Devices are packed in accordance with EIA standard RS-481-A and specifications



Case	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.5	1.75	3.5	4.0	4.0	2.0	8.0



Reel Size	D	D1	D2	G	H	I	W1	W2	Qty. (pcs)
7"	Ø178	54.4	13.0	R78.0	R25.6	R6.5	9.5	12.3	3000

IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
4. NextGen Component, Inc (*NextGen*) reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
5. *NextGen* makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does *NextGen* assume any liability for application assistance or customer product design.
6. *NextGen* does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application. No license is granted by implication or otherwise under any intellectual property rights of NextGen.
7. *NextGen* products are not authorized for use as critical components in life support devices or systems without express written approval by *NextGen*.
8. *NextGen* requires that customers first obtain an RMA (Returned Merchandise Authorization) number prior to returning any products. Returns must be made within 30 days of the date of invoice, be in the original packaging, unused and like-new condition. At the time of quoting or purchasing, a product may say that it is Non-Cancelable/ Non-Returnable (NCNR). These products are not returnable and not refundable.