1.Description

The XC6232 series is a high-precision, low-dropout, low-current, three-terminal step-down regulator. It supports input voltages up to 10V. It delivers high output current with excellent regulation even under minimal voltage differences. It integrates a high-precision reference voltage source and overcurrent protection for the output power transistors.

The enable pin, EN, controls the chip's standby mode, significantly reducing quiescent current consumption. This makes it particularly suitable for applications with stringent battery life requirements. Packages include SOT23, SOT23-5, SOT89, or DFN1X1-4.

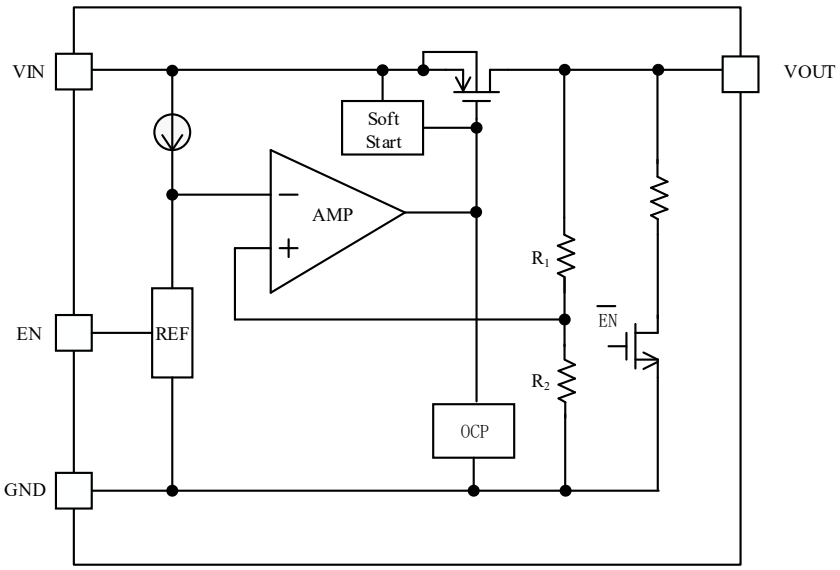
2.Features

- Maximum operating voltage: 10V
- Low quiescent current consumption (typically 2uA@6V)
- Low dropout voltage (75mV@50mA, V_{OUT}=3.3V)
- Built-in overcurrent protection and short-circuit protection
- EN pin standby function
- High-precision output voltage: ±2%
- Selectable output voltage: 1.5V ~ 3.6V
- PSRR：76dB@1KHz
- Maximum output current: 450mA
- Low output noise: 70μVRMS@10~100KHz

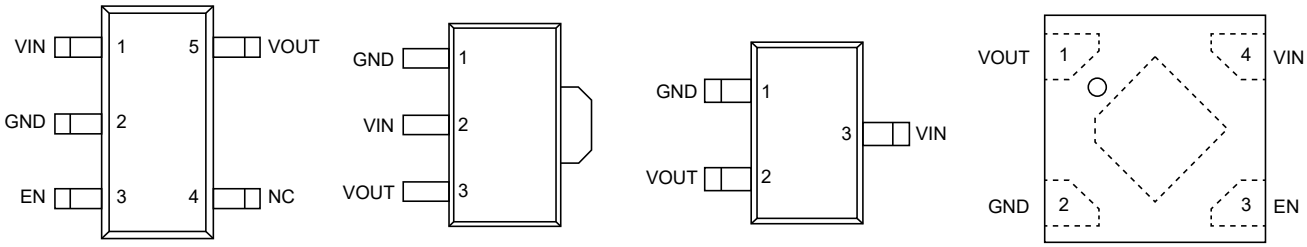
3.Applications

- 1-2 Cell Li-ion Portable Devices
- 2-6 Cell Dry Cell Battery Powered System
- Bluetooth or RF system
- Consumer Products

4.Internal Block Diagram



5.Pinning Information



Pin Description

Pin Name	Functions DeDriveription
VIN	Power Input
VOUT	Voltage Output
GND	Power Ground
EN	Standby Control Input, high level for normal operation, low level for standby mode
NC	Not Connected

6.Absolute Maximum Ratings

Parameter		Value	Value	Units
Input Voltage Range	VOUT>3V	V_{IN}	-0.3 ~11	V
	VOUT<3V		-0.3 ~10	V
Output Current		I_{OUT}	450	mA
Output Voltage Range		V_{OUT}	-0.3~V_{IN}+0.3	V
Maximum Junction Temperature		T_J	150	°C
Maximum Power Dissipation	SOT23-3	P_D	300	mW
	SOT23-5		400	
	SOT89-3		600	
	DFN1X1-4		450	
Operating Temperature Range		T_A	-40 to 85	°C
Storage Temperature Range		T_{STG}	-55 to 165	°C

The parameters in the table above represent the circuit's maximum tolerance range. If these parameters are reached or exceeded, the circuit will not function properly and may be damaged. Prolonged operation at critical limit parameters also significantly increases the risk of damage.

7.Electrical Characteristics

Unless otherwise specified, T_J = +25°C, V_{IN} = V_{OUT} + 1V, C_{IN} = C_{OUT} = 1μF

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Input Voltage	V_{IN}			2.2		10	V
Supply Current	I_{SS}	V_{IN}=6V, I_{OUT}=0mA			2		μA
Standby Current	I_{STB}	V_{EN}=0V				0.1	μA
Output Voltage Accuracy	V_{OUT}	V_{IN}=V_{OUT}+1V, I_{OUT}=1mA		V_{OUT} *0.98		V_{OUT} *1.02	V
Line Regulation	$\Delta V_{OUT}/(\Delta V_{IN}*V_{OUT})$	V_{OUT}+1V≤V_{IN}≤6V, I_{OUT}=10mA			0.02	0.1	%/V
Load Regulation	ΔV_{OUT}	V_{IN}=V_{OUT}+1V, 1mA≤I_{OUT}≤200mA			0.2	1	%
Output Temperature Coefficient	$\Delta V_{OUT}/(\Delta T*V_{OUT})$	I_{OUT}=10mA, -25°C≤T_a≤85°C			±100		ppm/°C
Output Current	I_{OUT}	V_{IN}=V_{OUT}+1V			400		mA
Low Dropout Voltage	V_{drop}	I_O=50mA	V_{OUT}≤2.0V		160		mV
			2.0<V_{OUT}≤3.0V		120		mV
			3.0<V_{OUT}≤5.0V		75		mV
PSRR	PSRR	V_{IN}=5V+1Vp-p(AC), f=1KHz V_{OUT}=3.3V, I_{OUT}=50mA			76		dB
Output Noise Voltage	V_{ON}	BW=10Hz to 100KHz			70		μVrms
EN input high level	V_{IH}	V_{IN}=5V		1.2			V
EN input low level	V_{IL}	V_{IN}=5V				0.4	V
Output Discharge Resistor	R_D	EN=0V, V_{OUT}=0.5V			500		Ω

8.Typical Application

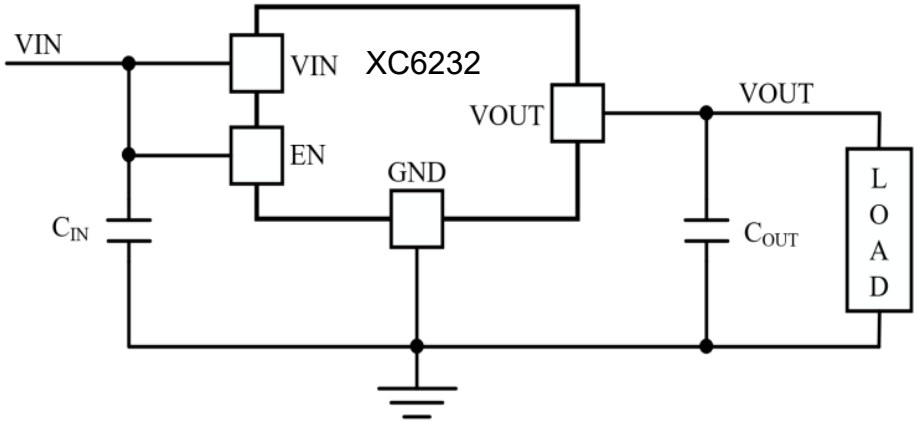


Figure 1 Typical Application Circuit

Note: The input capacitor C_{IN} is recommended to be at least 1μF; to ensure output voltage stability, the output capacitor C_{OUT} should be a ceramic capacitor of at least 1μF, or an electrolytic capacitor of at least 2.2μF.

9.1 Typical Characteristic (C_{IN}=1μF, C_{OUT}=1μF)

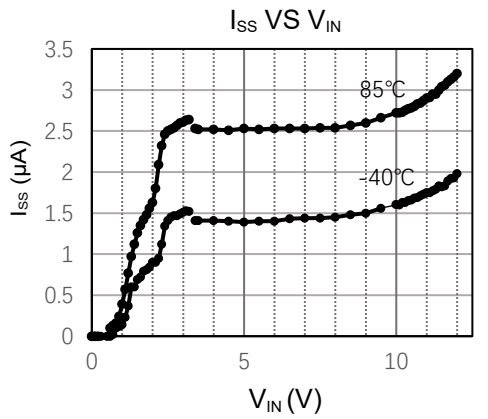


Figure 1: Quiescent current changes with input voltage (Vout=3.3V, 0mA)

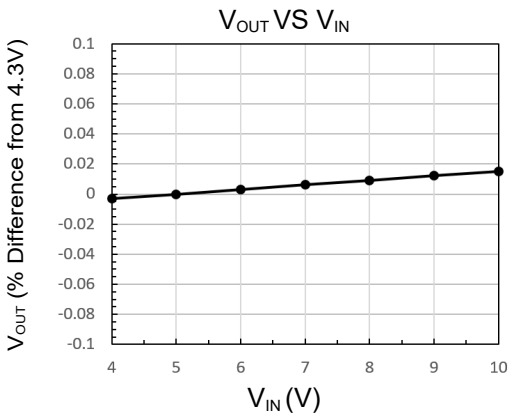


Figure 2: Output voltage changes with input voltage (I_{OUT}=10mA)

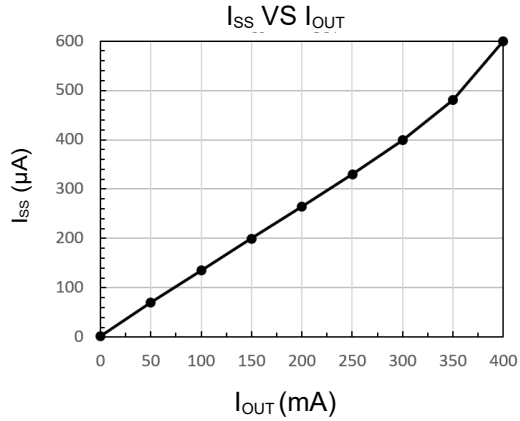


Figure 3: Quiescent current changes with load current (V_{IN}=4.3V)

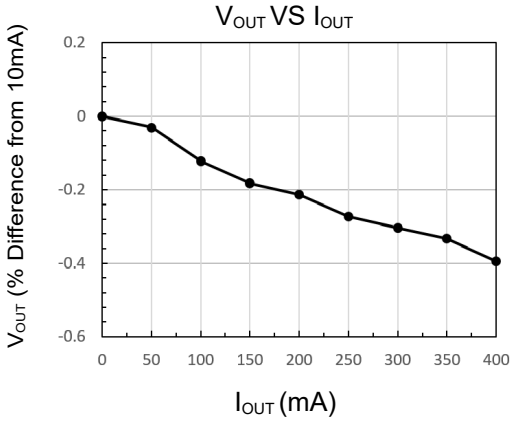


Figure 4: Output voltage changes with load current (V_{IN}=4.3V)

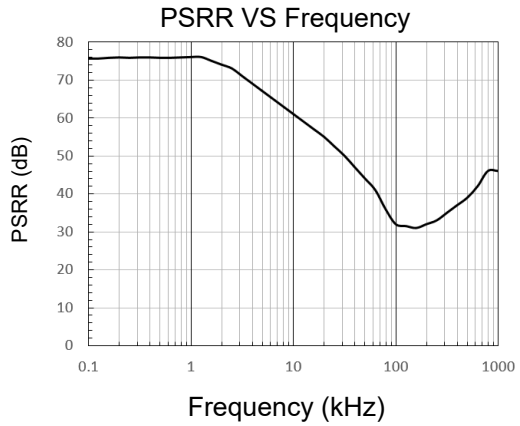


Figure 5: Power supply ripple rejection ratio (V_{IN}=5V+1V_{P-P} I_{OUT}=50mA)

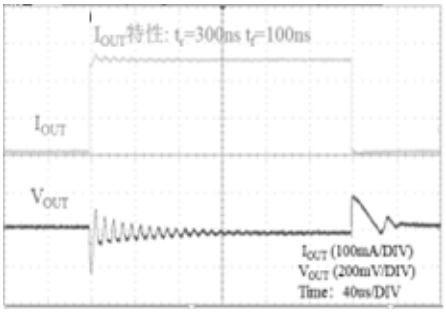


Figure 6: Load Step Response (V_{IN}=4.3V, 10mA~250mA Step)

9.2 Typical Characteristic (C_{IN}=1μF, C_{OUT}=1μF)

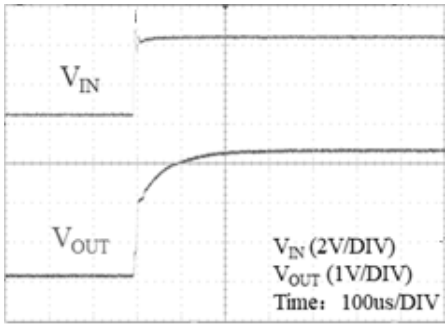


Figure 7: Power supply power on response
(I_{OUT}=0mA, 0V~4.3V Power-On)

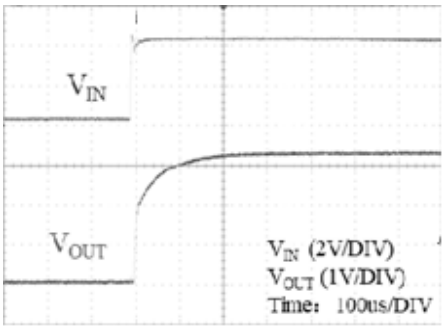
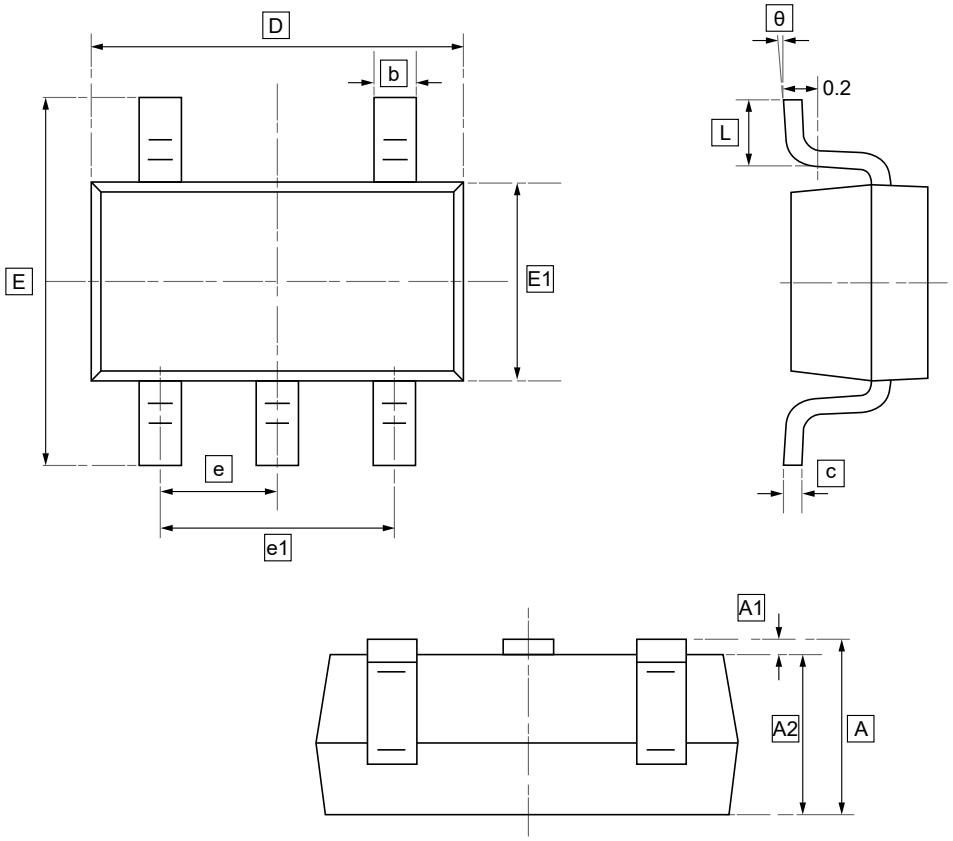


Figure 8: Power supply power-on response
(I_{OUT}=150mA, 0V~4.3V Power-On)

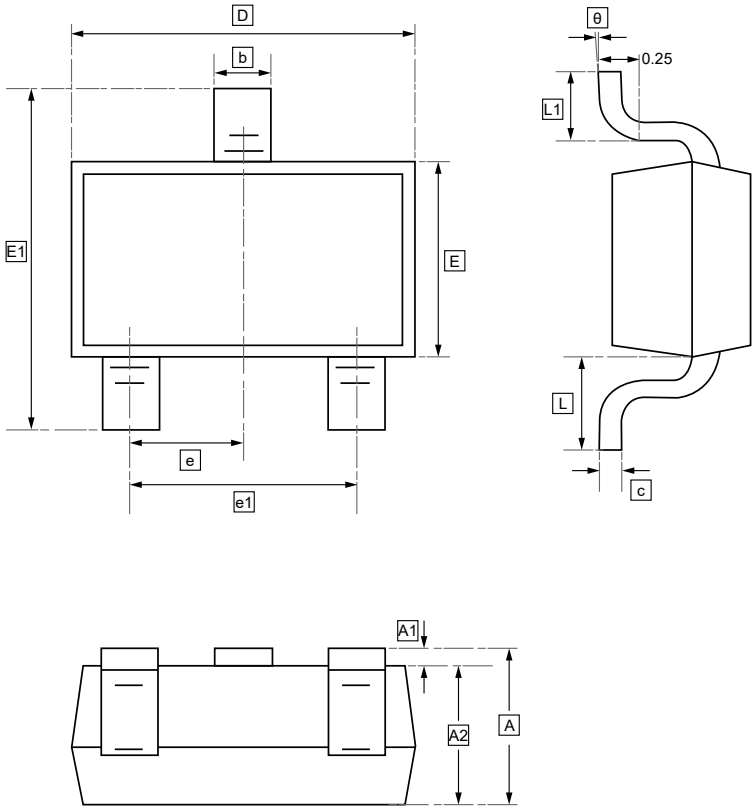
10.1 SOT-23-5 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E1	E	e	e1	L	θ
Min	1.050	0.000	1.050	0.300	0.100	2.820	1.500	2.650	0.950	1.800	0.300	0°
Max	1.250	0.100	1.150	0.500	0.200	3.020	1.700	2.950	BSC	2.000	0.600	8°

10.2 SOT-23 Package Outline Dimensions

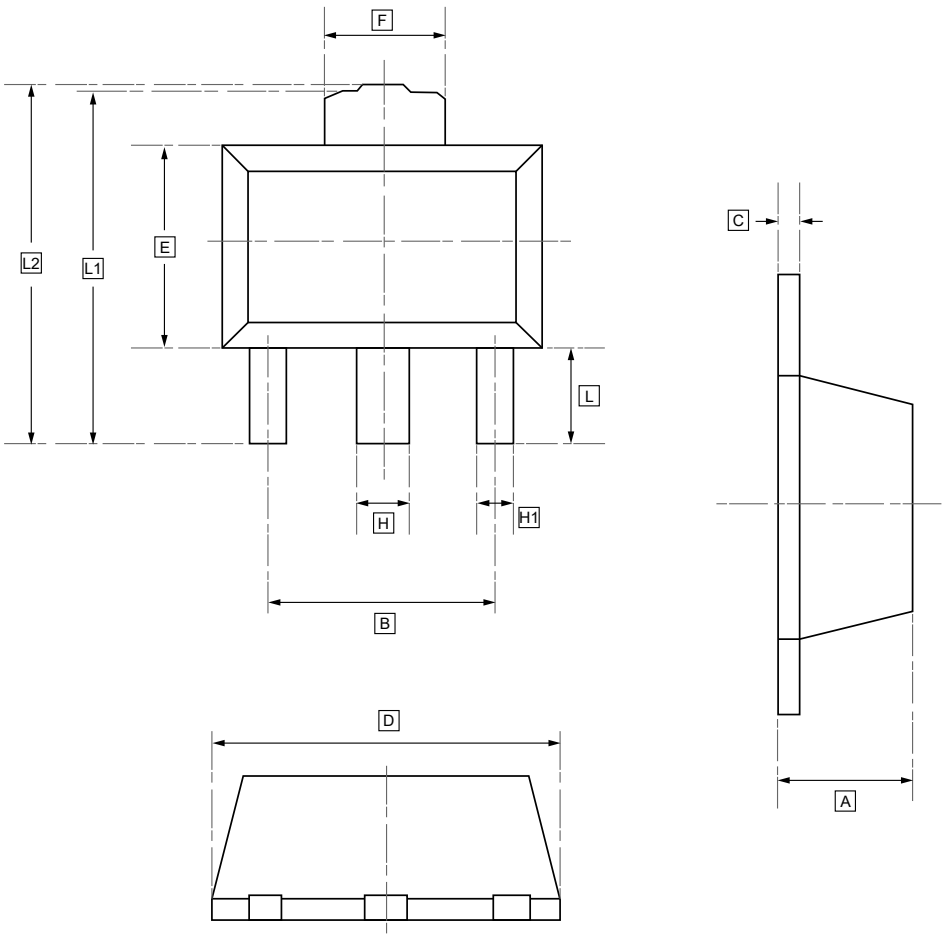


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	e1	L	L1
Min	0.9	0.000	0.900	0.300	0.080	2.800	1.200	2.250	0.95	1.80	0.550	0.300
Max	1.15	0.15	1.050	0.500	0.150	3.000	1.400	2.550	TYP.	2.00		0.500

Symbol	θ
Min	0°
Max	8°

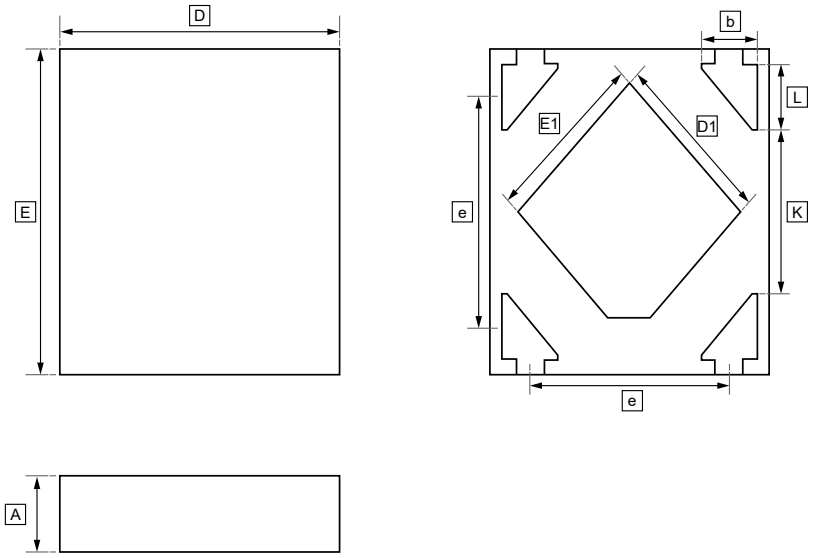
10.3 SOT-89-3 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	F	H	H1	L	L1	L2
Min	1.450	2.950	0.330	4.450	2.450	1.650	0.450	0.370	0.900	4.100	4.100
Max	1.550	3.050	0.430	4.550	2.550	1.750	0.580	0.480	1.000	4.300	4.350

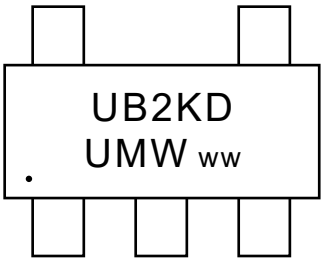
10.4 DFN1X1-4 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	b	D	e	E	E1	D1	L	K
Min	0.48	0.18	0.95	0.65	0.95	0.45	0.45	0.18	0.42
Max	0.52	0.22	1.05		1.05	0.52	0.52	0.24	0.48

12.Ordering Information



ww: Batch Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW XC6232B152MR	UXEK	SOT23-5	3000	Tape and reel
UMW XC6232B182MR	UXKK	SOT23-5	3000	Tape and reel
UMW XC6232B252MR	UXTK	SOT23-5	3000	Tape and reel
UMW XC6232B282MR	UXXK	SOT23-5	3000	Tape and reel
UMW XC6232B302MR	UXZK	SOT23-5	3000	Tape and reel
UMW XC6232B332MR	UB2K	SOT23-5	3000	Tape and reel
UMW XC6232B362MR	UB5K	SOT23-5	3000	Tape and reel
UMW XC6232B152PR	UXEK	SOT89-3	3000	Tape and reel
UMW XC6232B182PR	UXKK	SOT89-3	1000	Tape and reel
UMW XC6232B252PR	UXTK	SOT89-3	1000	Tape and reel
UMW XC6232B282PR	UXXK	SOT89-3	1000	Tape and reel
UMW XC6232B302PR	UXZK	SOT89-3	1000	Tape and reel
UMW XC6232B332PR	UB2K	SOT89-3	1000	Tape and reel
UMW XC6232B362PR	UB5K	SOT89-3	1000	Tape and reel

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW XC6232B152DR	UXEKD	DFN1X1-4	10000	Tape and reel
UMW XC6232B182DR	UXKKD	DFN1X1-4	10000	Tape and reel
UMW XC6232B252DR	UXTKD	DFN1X1-4	10000	Tape and reel
UMW XC6232B282DR	UXXKD	DFN1X1-4	10000	Tape and reel
UMW XC6232B302DR	UXZKD	DFN1X1-4	10000	Tape and reel
UMW XC6232B332DR	UB2KD	DFN1X1-4	10000	Tape and reel
UMW XC6232B362DR	UB5KD	DFN1X1-4	10000	Tape and reel
UMW XC6232B152MR	UXEK3	SOT23-3	3000	Tape and reel
UMW XC6232B182MR	UXKK3	SOT23-3	3000	Tape and reel
UMW XC6232B252MR	UXTK3	SOT23-3	3000	Tape and reel
UMW XC6232B282MR	UXXK3	SOT23-3	3000	Tape and reel
UMW XC6232B302MR	UXZK3	SOT23-3	3000	Tape and reel
UMW XC6232B332MR	UB2K3	SOT23-3	3000	Tape and reel
UMW XC6232B362MR	UB5K3	SOT23-3	3000	Tape and reel

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