

/ Descriptions

TO-251 P MOS P-CHANNEL MOSFET in a TO-251 Plastic Package.

/ Features

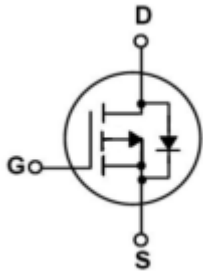
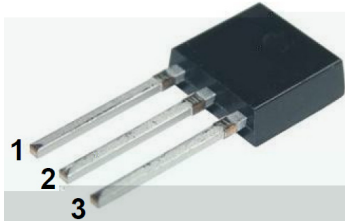
$R_{DS(on)}$ C_{rss}

Low $R_{DS(on)}$, low gate charge, low C_{rss} , fast switching.

/ Applications

DC/DC

Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products.

/ Equivalent Circuit**/ Pinning**

PIN1 G PIN 2 D PIN 3 S PIN 4 D

/ h_{FE} Classifications & Marking

See Marking Instructions.


/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	-100	V
Drain Current	$I_D(T_c=25)$	-30	A
Drain Current	$I_D(T_c=100)$	-21.5	A
Drain Current - Pulsed ^C	I_{DM}	-80	A
Gate-Source Voltage	V_{GS}	±20	V
Avalanche Current ^C	I_{AS}	-27.0	A
Avalanche energy L=0.5mH ^C	E_{AS}	291.6	mJ
Power Dissipation ^B	$P_D(T_c=25)$	53.5	W
	$P_D(T_c=100)$	26.5	W
Power Dissipation ^A	$P_{DSM}(T_A=25)$	2.5	W
	$P_{DSM}(T_A=70)$	1.6	W
Junction and Storage Temperature Range	$T_j T_{stg}$	-55 150	°C

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-100V$ $V_{GS}=0V$			-1.0	μA
		$V_{DS}=-100V$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			±0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	-1	-1.7	-3	V
Static Drain-Source On-Resistance	$R_{DS(on)1}$	$V_{GS}=-10V$ $I_D=-30A$		46	50	mΩ
	$R_{DS(on)2}$	$V_{GS}=-4.5V$ $I_D=-15A$		49	51	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-10V$ $I_D=-10A$		25		S
Diode Forward Voltage	V_{SD}	$I_S=-30A$ $V_{GS}=0V$		-0.72	-1.3	V

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		5110		pF
Output Capacitance	C_{oss}			198		
Reverse Transfer Capacitance	C_{rss}			131		
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		3.87		Ω
Total Gate Charge	$Q_g(10V)$	$V_{GS}=-10V$ $V_{DS}=-50V$ $I_D=-20A$		16.5	25	nC
Total Gate Charge	$Q_g(4.5V)$			7	12	
Gate Source Charge	Q_{gs}			4.5		
Gate Drain Charge	Q_{gd}			2.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $V_{DS}=-50V$ $R_L=2.5\Omega$ $R_{GEN}=23\Omega$		7		ns
Turn-On Rise Time	t_r			8		
Turn-Off Delay Time	$t_{d(off)}$			20		
Turn-Off Fall Time	t_f			3		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-20A$ $dI/dt=500A/ms$		30		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=-20A$ $dI/dt=500A/ms$		145		nC
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	$t \leq 10s$		16	20	$^{\circ}C/W$
Maximum Junction-to-Ambient ^{AD}		steady-State		41	50	$^{\circ}C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	steady-State		2.2	2.8	$^{\circ}C/W$

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}C$. The Power dissipation PDSM is based on $R_{\theta JA}$ and the maximum allowed junction temperature of $150^{\circ}C$. The value in any given application depends on the user's specific board design, and the maximum temperature of $150^{\circ}C$ may be used if the PCB allows it.

B. The power dissipation PD is based on $T_{J(MAX)}=150^{\circ}C$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width

/ Electrical Characteristic Curve

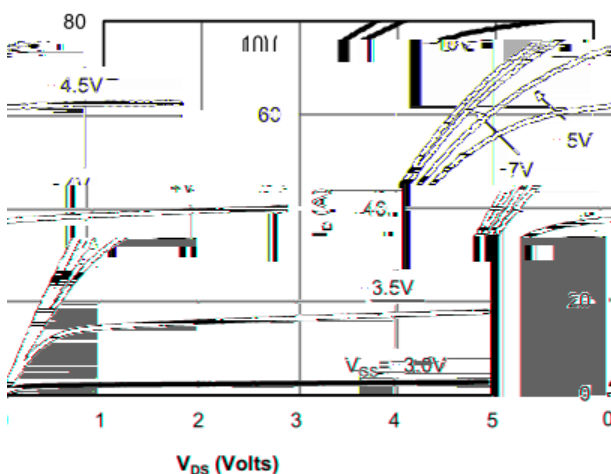


Fig 1: On-Region Characteristics

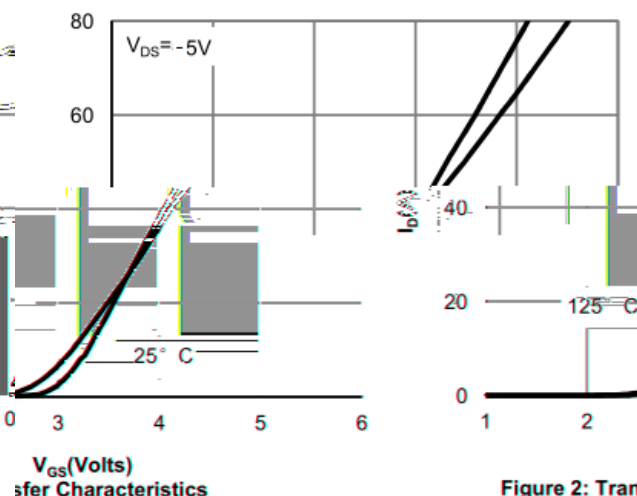


Figure 2: Trans

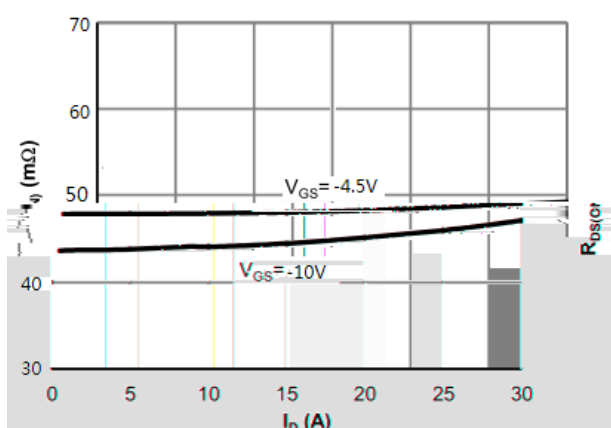
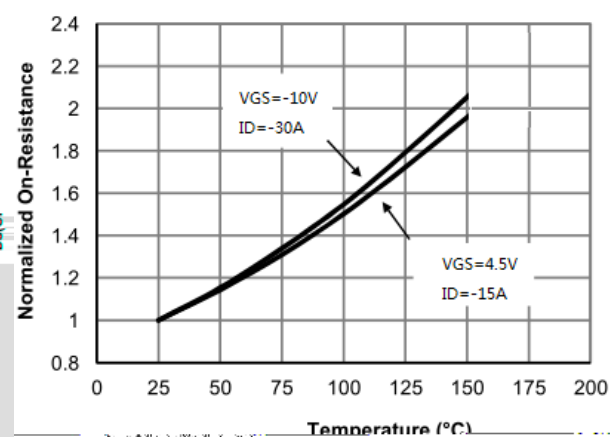


Figure 3: On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Junction Temperature

Figure 4:

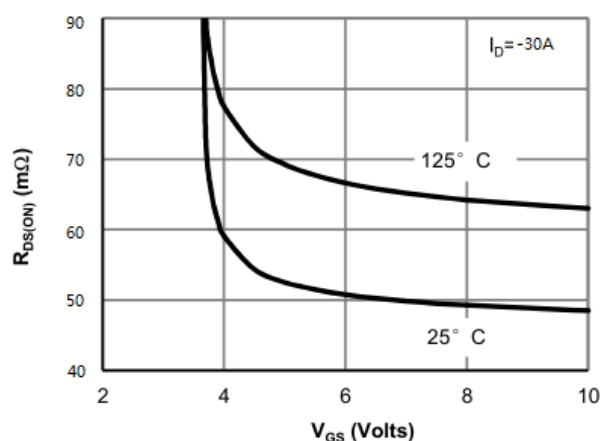


Figure 5: On-Resistance vs. Gate-Source Voltage

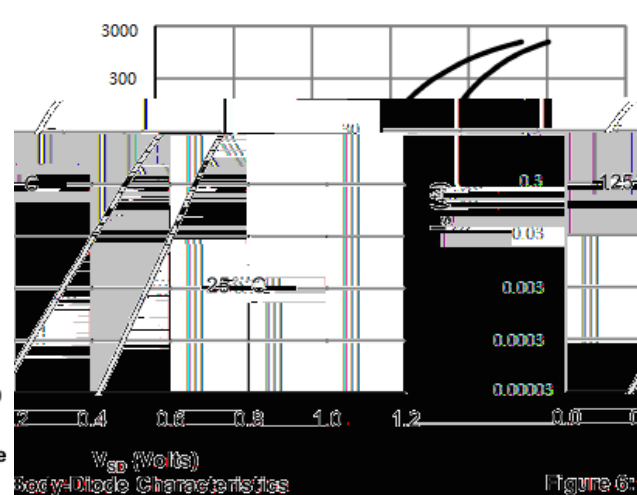


Figure 6:

/ Electrical Characteristic Curve

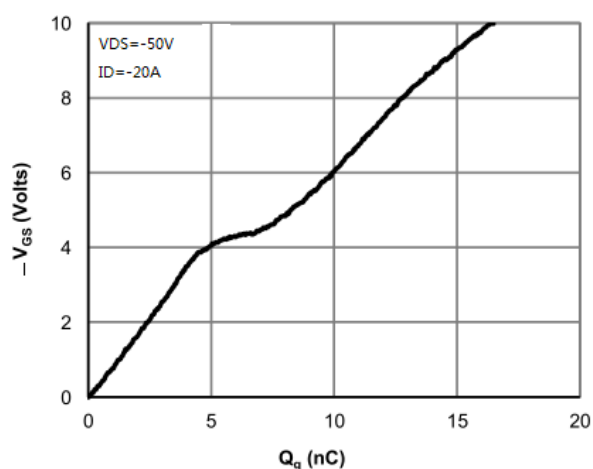


Figure 7: Gate-Charge Characteristics

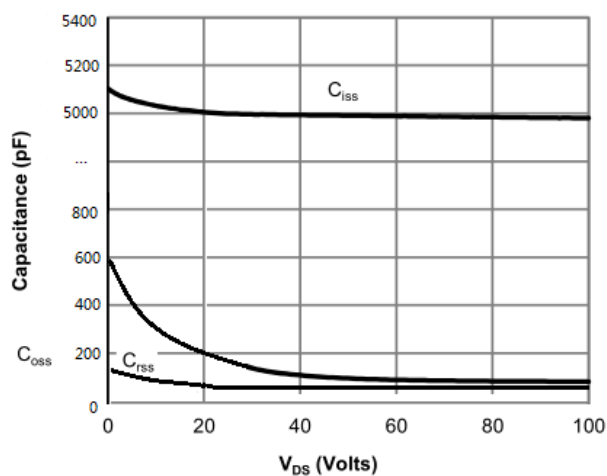
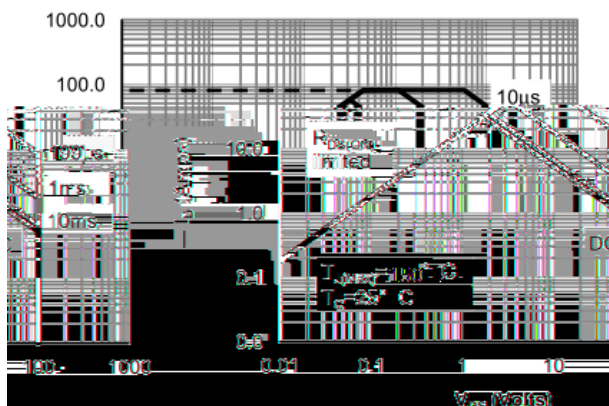
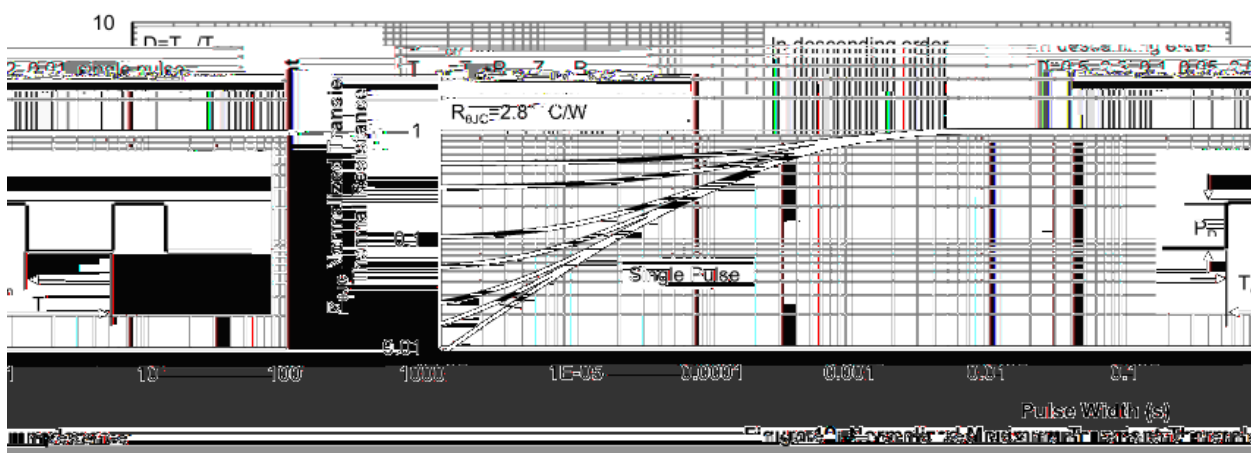


Figure 8: Capacitance Characteristics

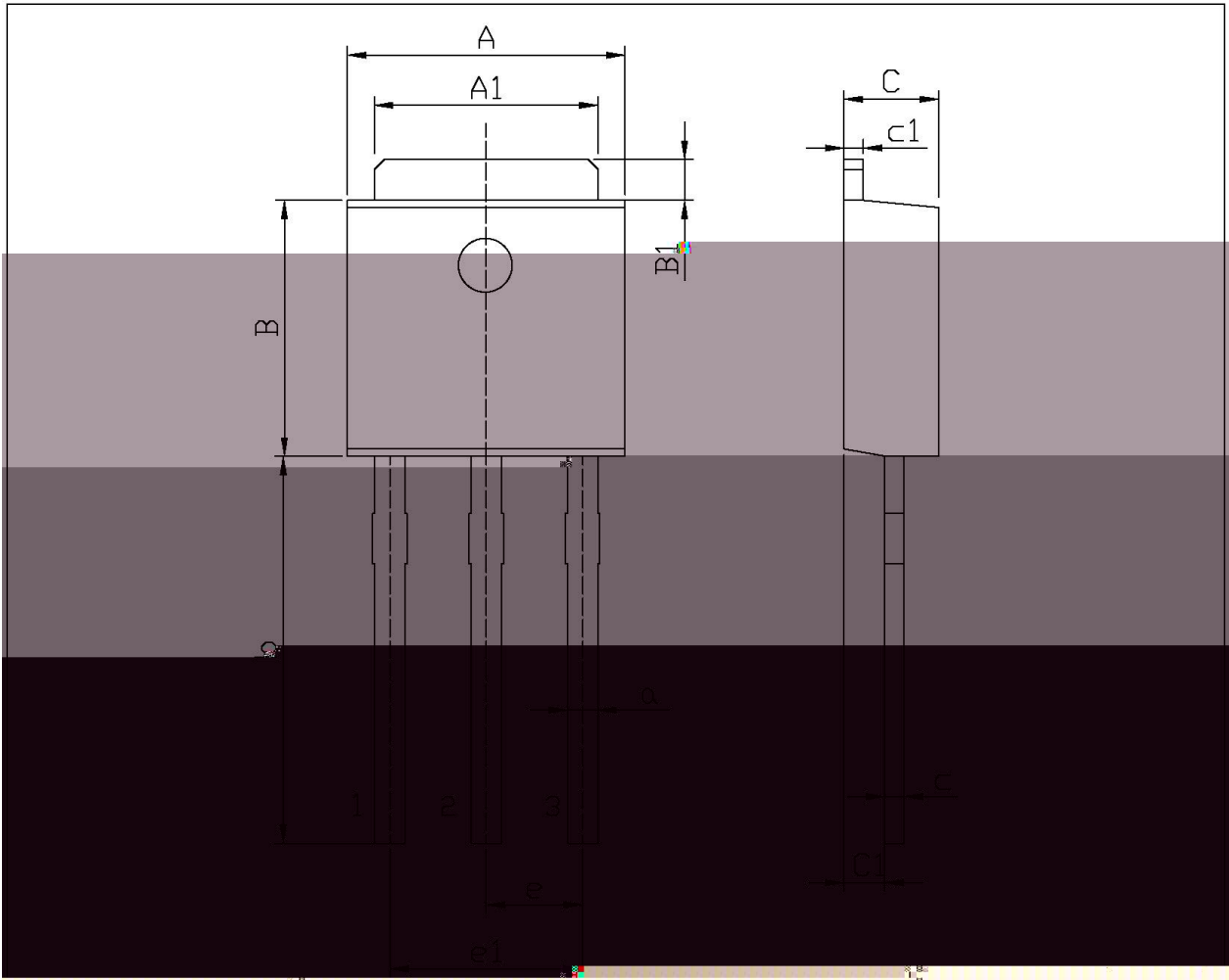


d Safe

Figure 9: Maximum Forward Bias Operating Area



/ Package Dimensions

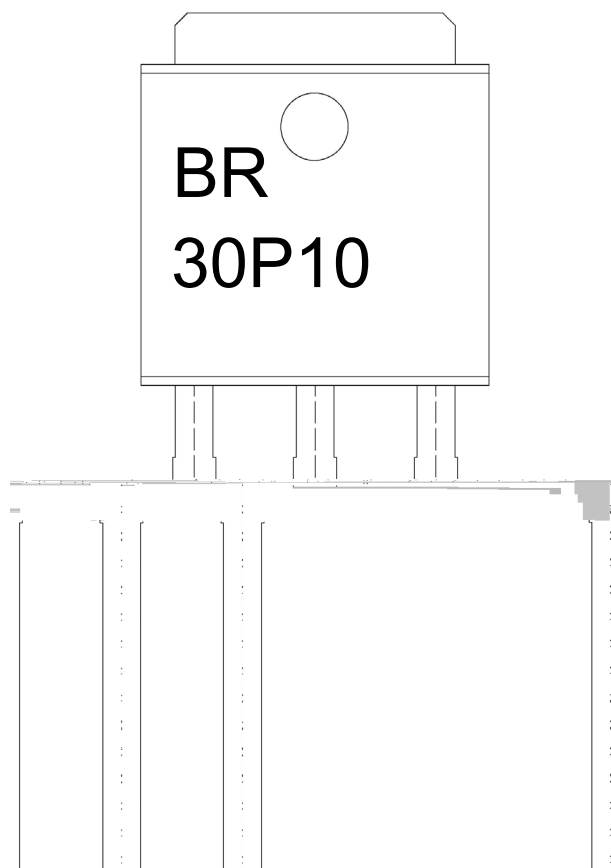


单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.45	6.75	a	0.50	0.70
A1	5.10	5.50	b	9.00	9.40
B	5.95	6.25	c	0.50	0.55
B1	0.95	1.25	c1	0.45	0.55
C	2.20	2.40	e	2.24	2.34
C1	0.95	1.15	e1	4.43	4.73

T0-251

/ Marking Instructions



BR

30P10

Note:

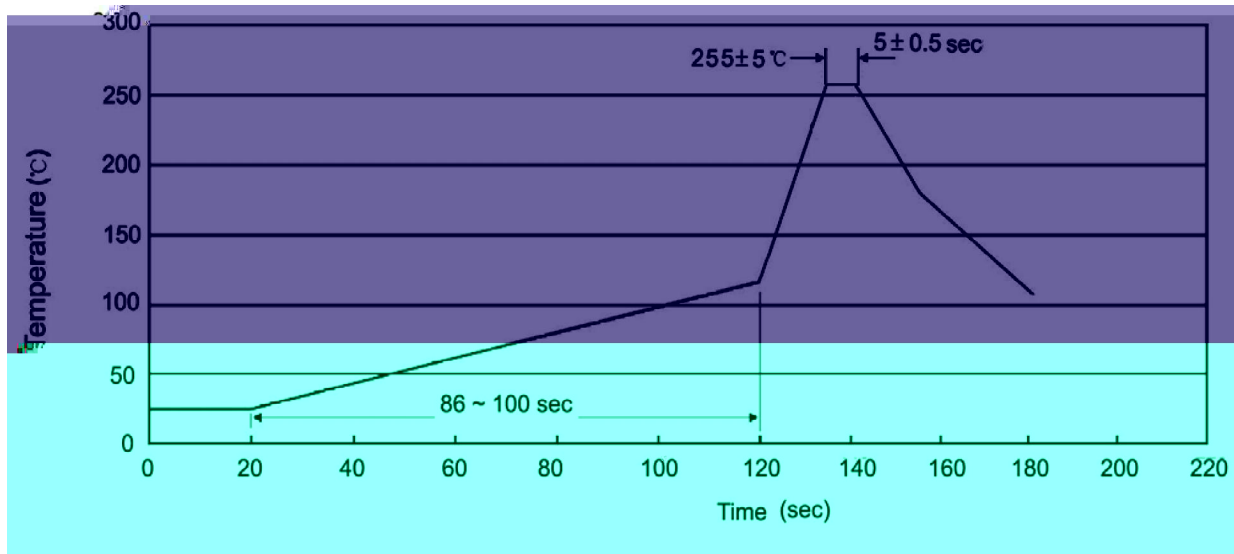
BR: Company Code

30P10: Product Type Code.

****: Lot No. Code, code change with Lot No.



() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- 1 25 150 60 90sec;
- 2 255±5 5±0.5sec;
- 3 2 10 /sec.

- 1.Preheating:25~150 , Time:60~90sec.
- 2.Peak Temp.:255±5 , Duration:5±0.5sec.
3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

270±5

10±1 sec.

Temp.:270±5°C

Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	只 卷盘	卷盘 盒	只 盒	盒 箱	只 箱		盒	箱

/ TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	只 套管	套管 盒	只 盒	盒 箱	只 箱	套管	盒	箱

/ Notices