

50V P-CHANNEL Enhancement Mode MOSFET

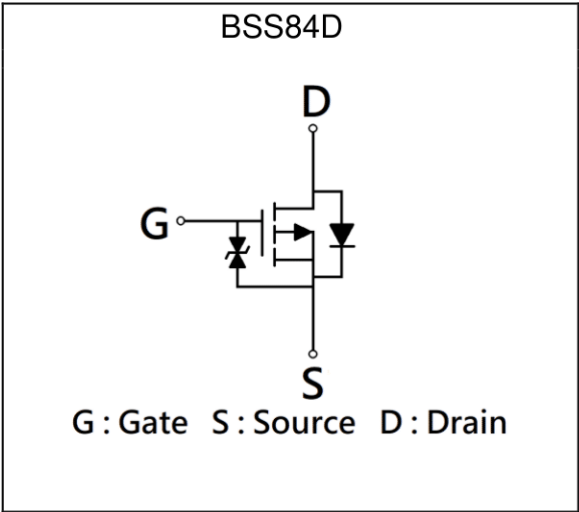
BSS84D

BV _{DSS}	-50V
I _D @ T _A =25°C, V _{GS} =-5V	-130mA
R _{DS(on)} @ V _{GS} =-5V, I _D =-100mA	6Ω (typ)

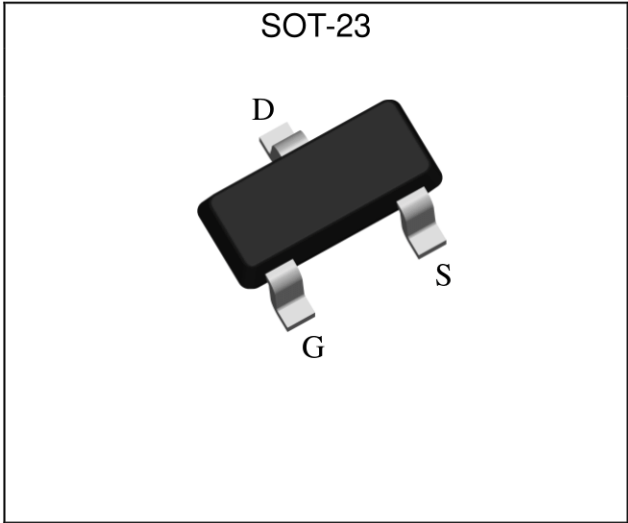
Features

- Low gate charge
- Excellent thermal and electrical capabilities
- Pb-free package

Equivalent Circuit



Outline



Ordering Information

Device	Package	Shipping
BSS84DT	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Tj=25°C, unless otherwise noted)

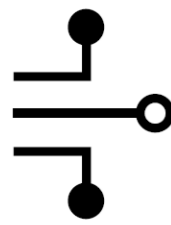
Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	-50	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ T _A =25°C, V _{GS} =-5V	I _D	-130	mA
Pulsed Drain Current (Note 1)	I _{DM}	-520	
Maximum Power Dissipation @ T _A =25°C	P _D	225	mW
Thermal Resistance, Junction-to-Ambient	R _{th,ja}	556	°C/W
Maximum Lead Temperature for Soldering Purpose, 10 s	T _L	260	°C
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	

Note : 1. Pulse width ≤ 10μs, duty cycle ≤ 2%.

Electrical Characteristics (Tj=25°C, unless otherwise specified)

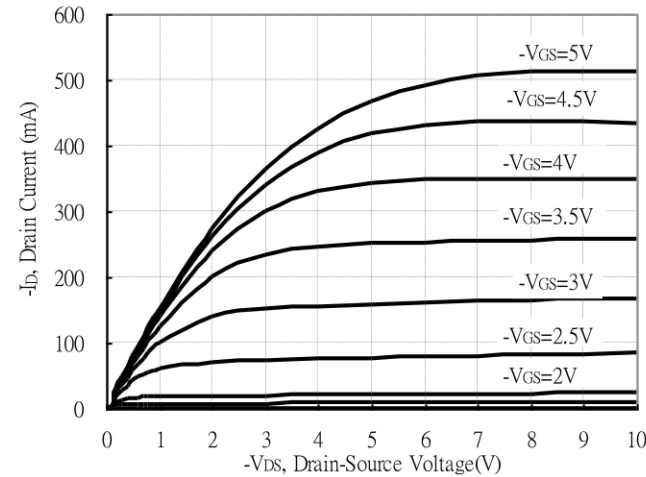
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-50	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-0.8	-1.4	-2		V _{DS} =V _{GS} , I _D =-1mA
G _{FS}	50	-	-	mS	V _{DS} =-25V, I _D =-100mA
I _{GSS}	-	-	±10	μA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-0.1	μA	V _{DS} =-25V, V _{GS} =0V
	-	-	-1		V _{DS} =-50V, V _{GS} =0V
	-	-	-25		V _{DS} =-50V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	6	10	Ω	V _{GS} =-5V, I _D =-100mA
Dynamic					
C _{iss}	-	25	-	pF	V _{DS} =-5V, V _{GS} =0V, f=1MHz
C _{oss}	-	7	-		
C _{rss}	-	2	-		
*t _{d(ON)}	-	2.5	-	ns	V _{DS} =-15V, I _D =-100mA, V _{GS} =-5V, R _G =3.3Ω
*t _r	-	2	-		
*t _{d(OFF)}	-	7.3	-		
*t _f	-	3	-		
*Q _g	-	1.2	-	nC	V _{DS} =-40V, I _D =-500mA, V _{GS} =-5V
Source-Drain Diode					
*I _S	-	-	-130	mA	
*I _{SM}	-	-	-520		
*V _{SD}	-	-0.85	-1.2	V	V _{GS} =0V, I _S =-130mA

*Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

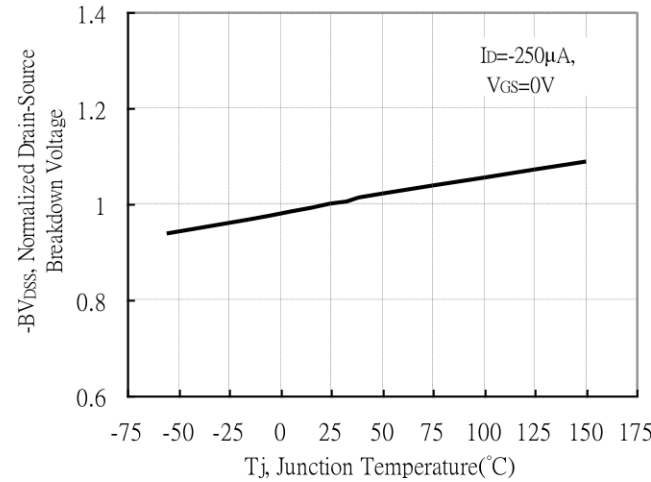


Typical Characteristics

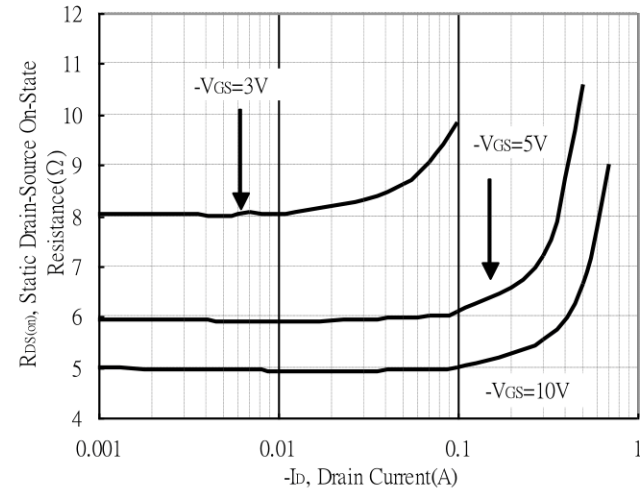
Typical Output Characteristics



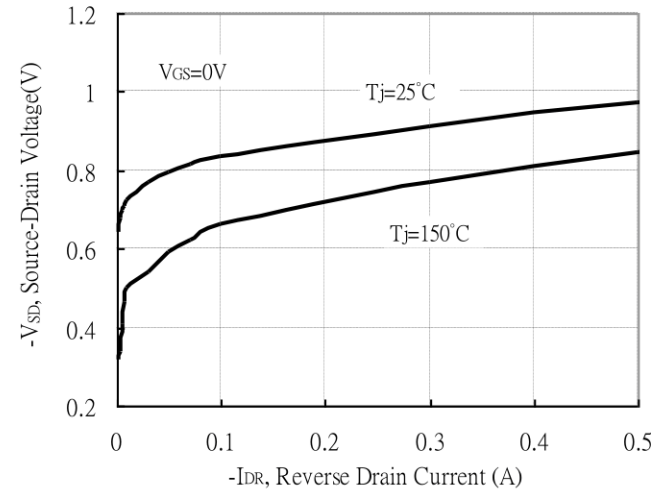
Breakdown Voltage vs Ambient Temperature



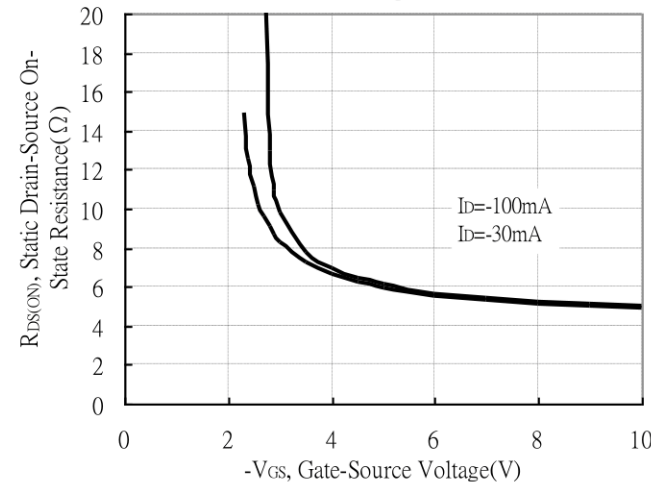
Static Drain-Source On-State resistance vs Drain Current



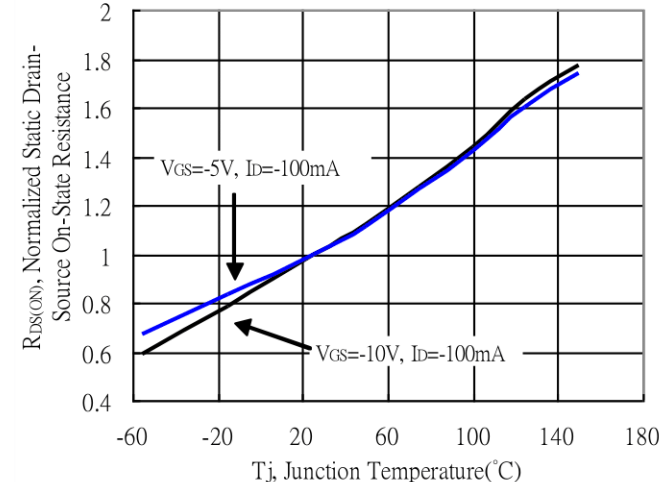
Reverse Drain Current vs Source-Drain Voltage

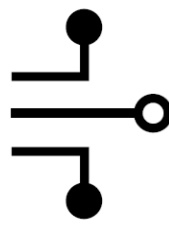


Static Drain-Source On-State Resistance vs Gate-Source Voltage

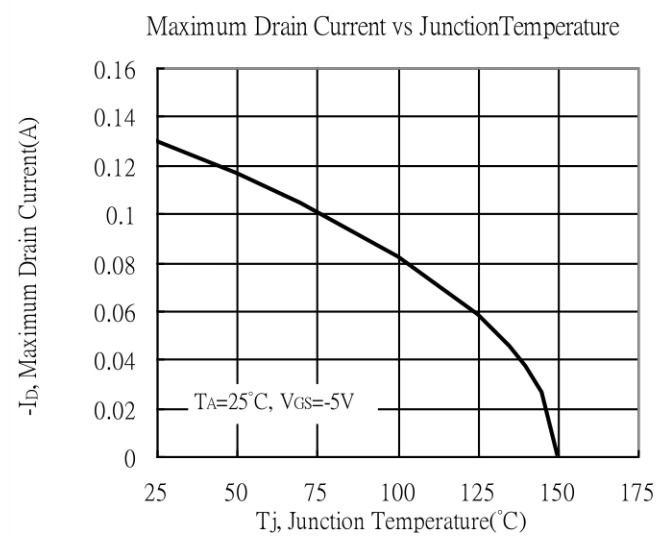
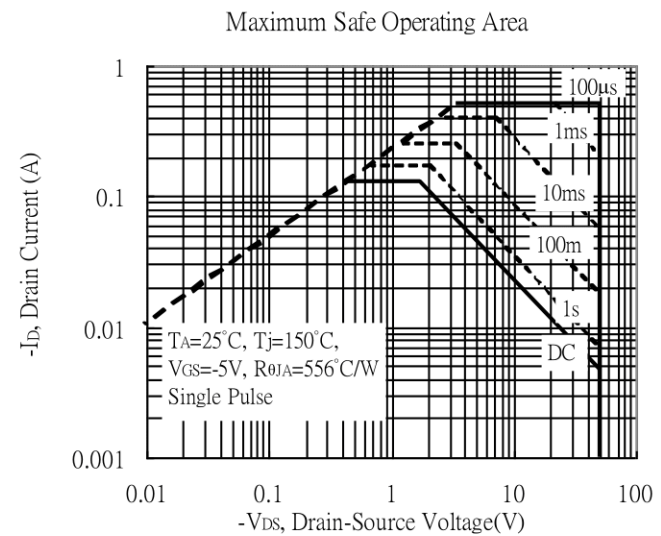
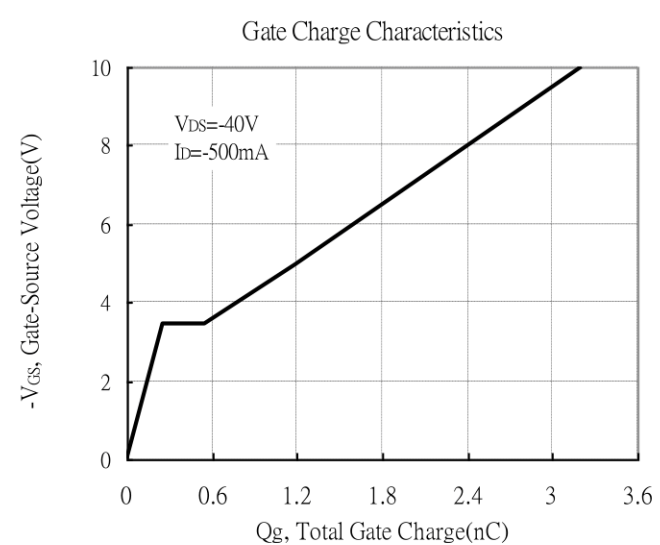
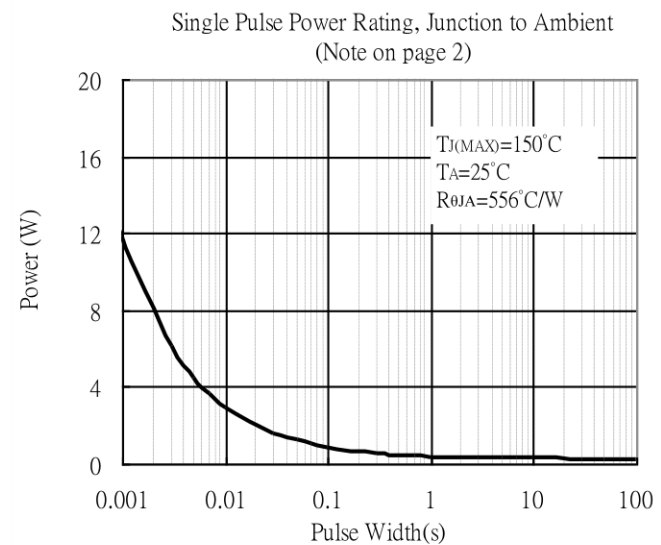
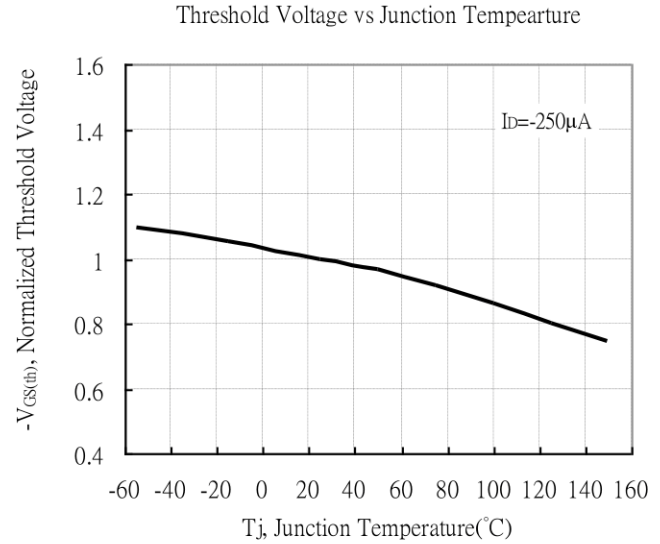
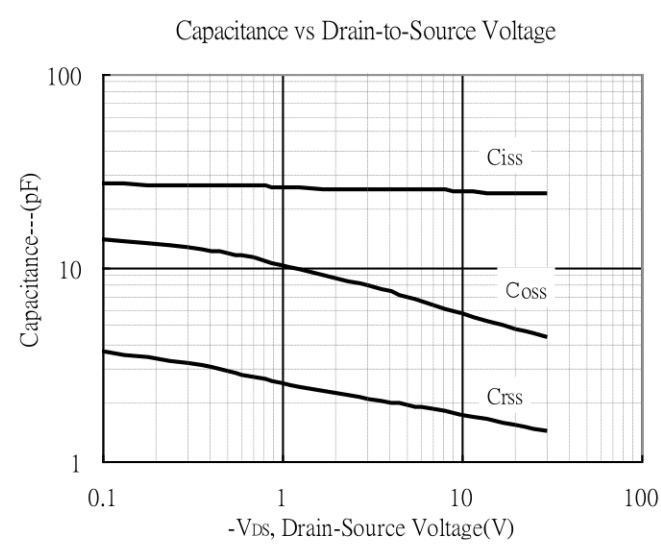


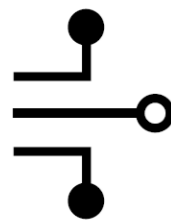
Drain-Source On-State Resistance vs Junction Temperature



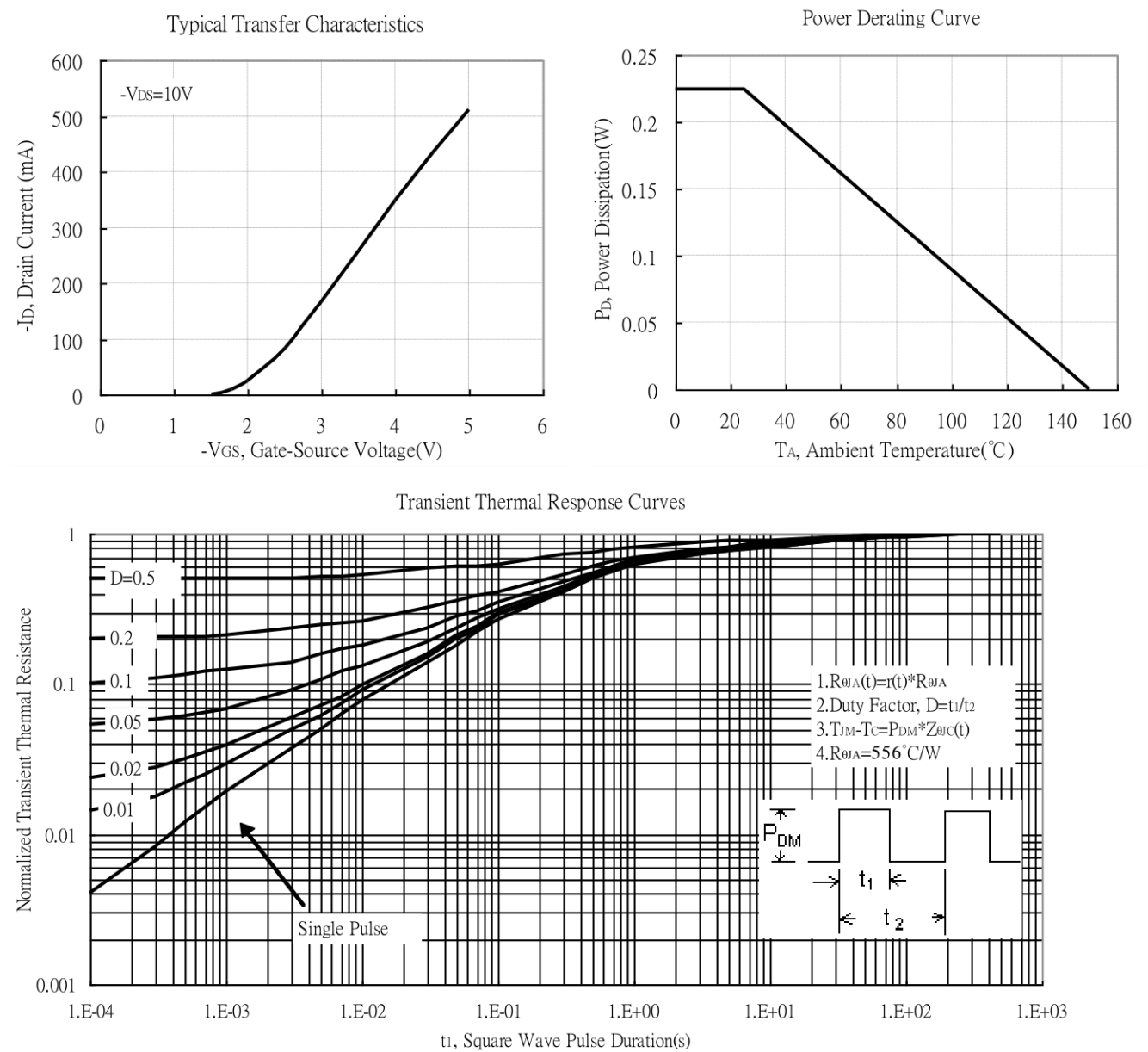


Typical Characteristics(Cont.)

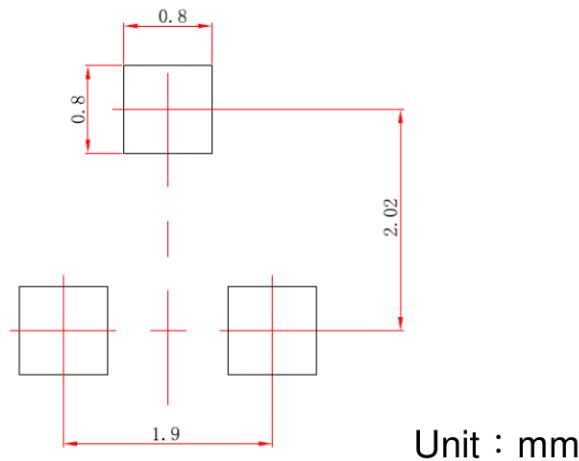




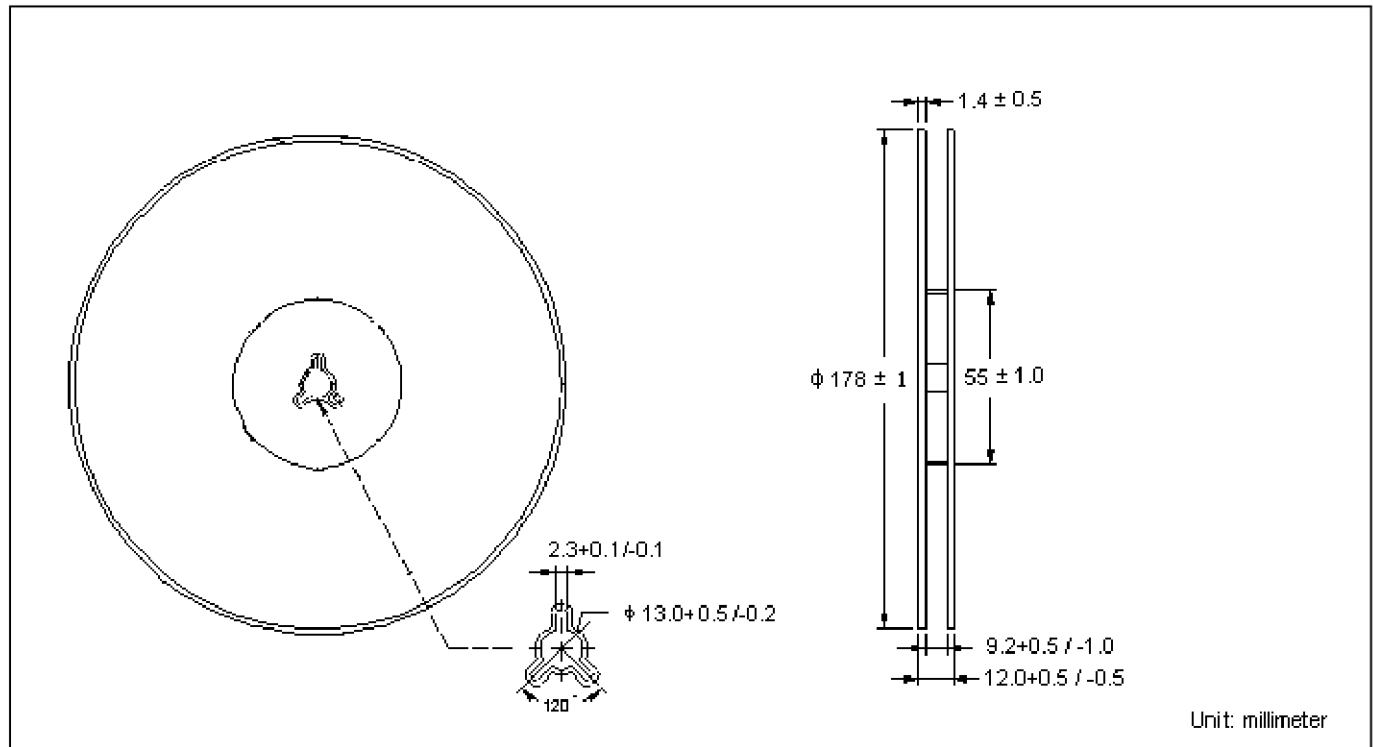
Typical Characteristics(Cont.)



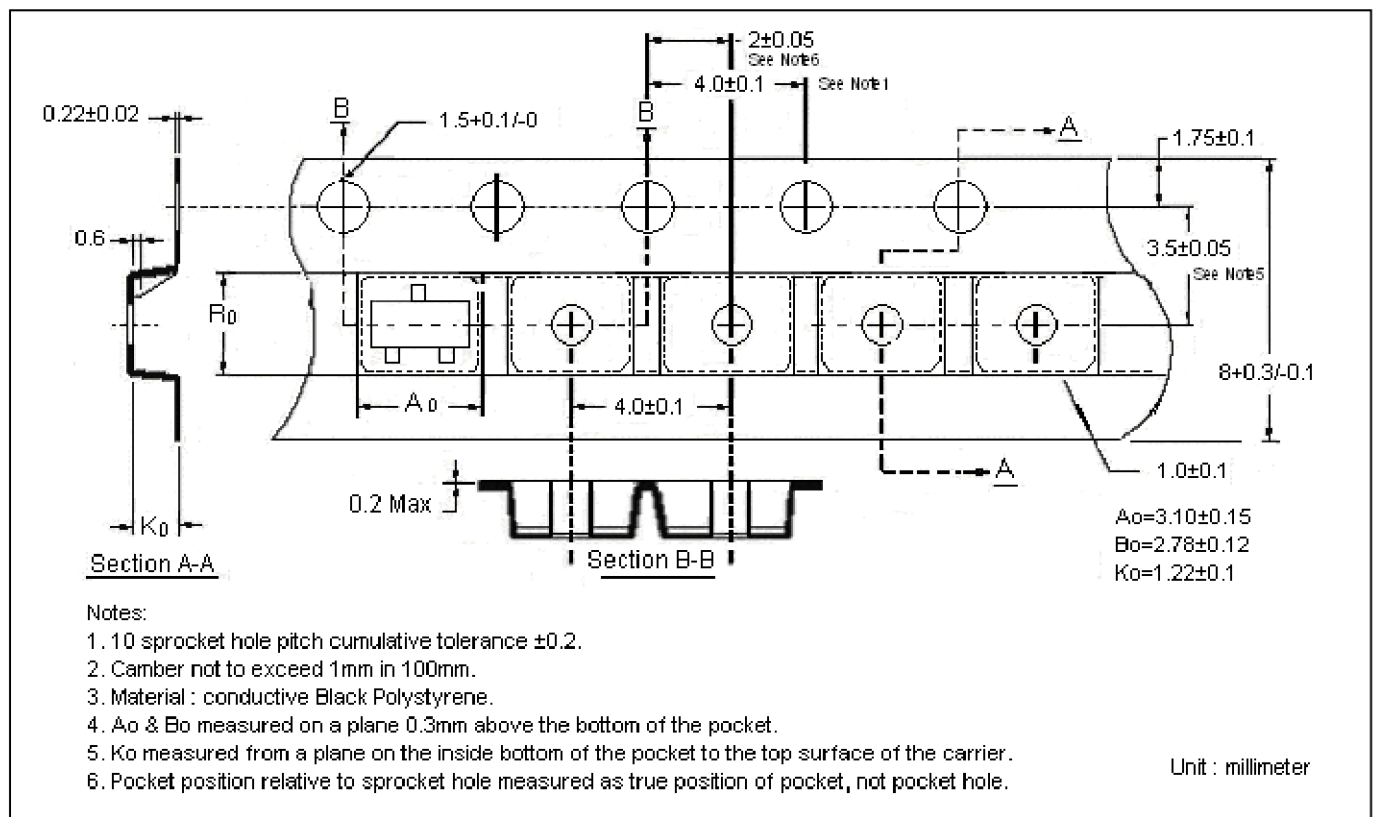
Recommended Soldering Footprint



Reel Dimension



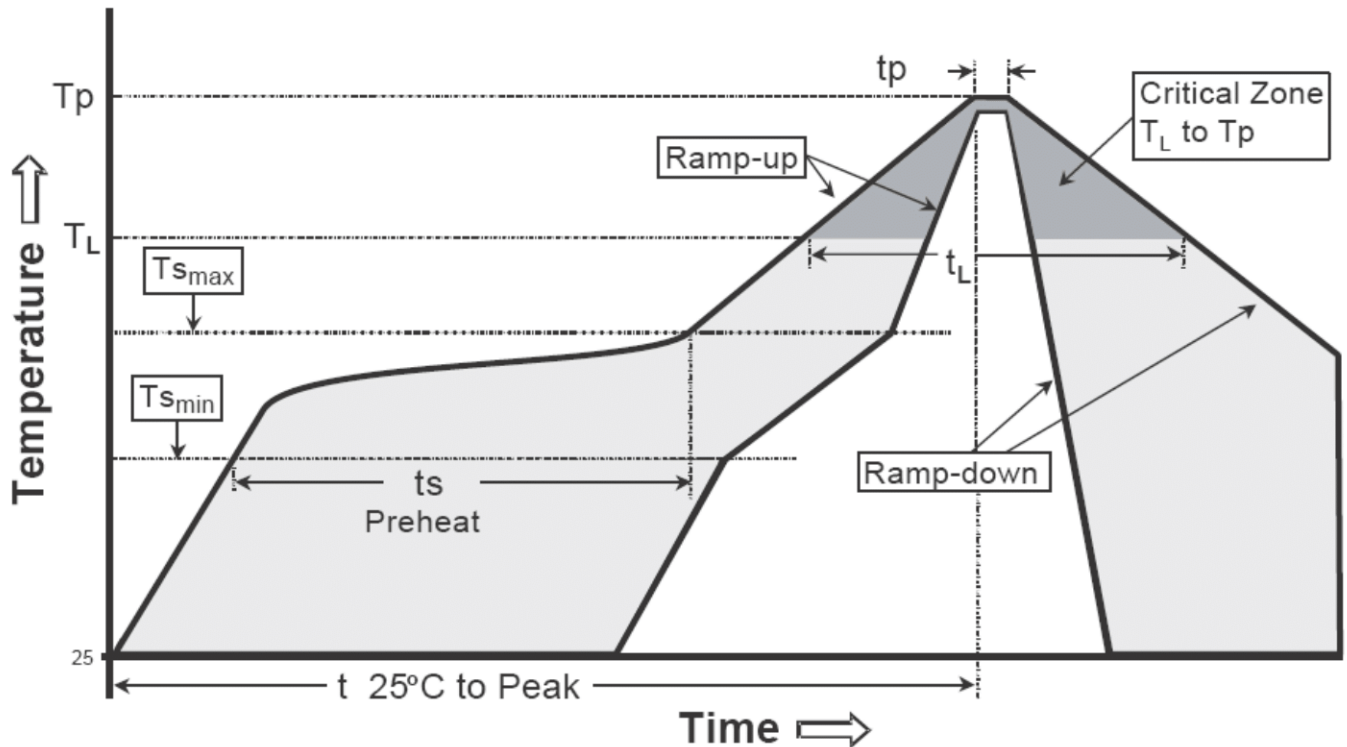
Carrier Tape Dimension



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow

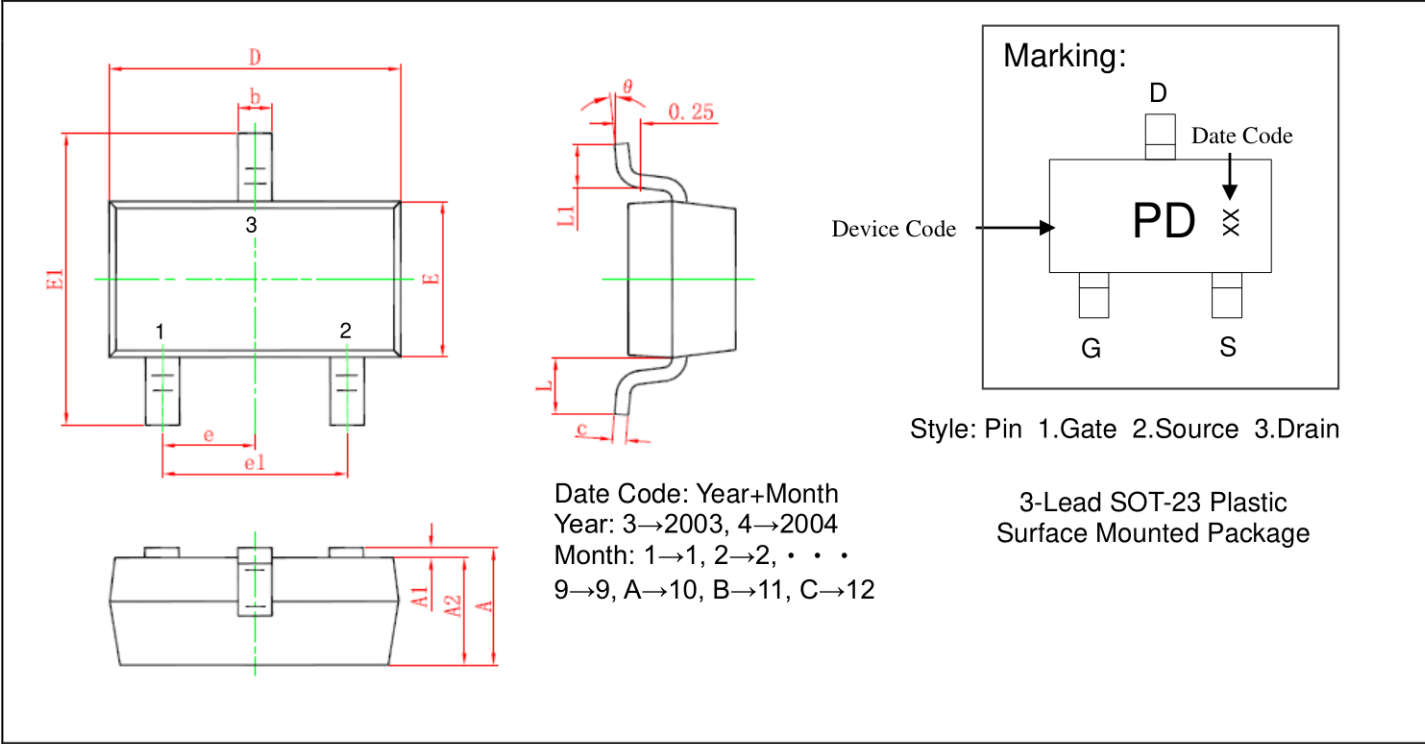


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T_{smax} to T_p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T_{smin})	100°C	150°C
-Temperature Max(T_{smax})	150°C	200°C
-Time(t_{smin} to t_{smax})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T_L)	183°C	217°C
- Time (t_L)	60-150 seconds	60-150 seconds
Peak Temperature(T_p)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t_p)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note :1. All temperatures refer to topside of the package, measured on the package body surface.

2.For devices mounted on FR-4 PCB of 1.6mm or equivalent grade PCB. If other grade PCB is used, care should be taken to match the coefficients of thermal expansion between components and PCB. If they are not matched well, the solder joints may crack or the bodies of the parts may crack or shatter as the assembly cools.

SOT-23 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.045	0.900	1.150	E1	0.089	0.100	2.250	2.550
A1	0.000	0.004	0.000	0.100	e	0.037 TYP.		0.950 TYP.	
A2	0.035	0.041	0.900	1.050	e1	0.071	0.079	1.800	2.000
b	0.012	0.020	0.300	0.500	L	0.022 REF.		0.550 REF.	
c	0.003	0.006	0.080	0.150	L1	0.012	0.020	0.300	0.500
D	0.110	0.118	2.800	3.000	θ	0°	8°	0°	8°
E	0.047	0.055	1.200	1.400					

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.