P-Channel Enhancement Mode Power MOSFET

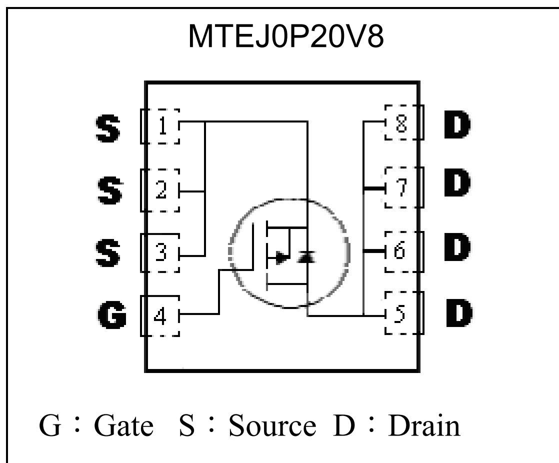
MTEJ0P20V8

BV_{DSS}	-200V
I_D	-3.9A @ V_{GS}=-10V, T_C=25˚C
$R_{DSON(Typ)}$	0.80Ω @ V_{GS}=-10V, I_D=-1A
	0.85Ω@ V_{GS}=-6V, I_D=-1A

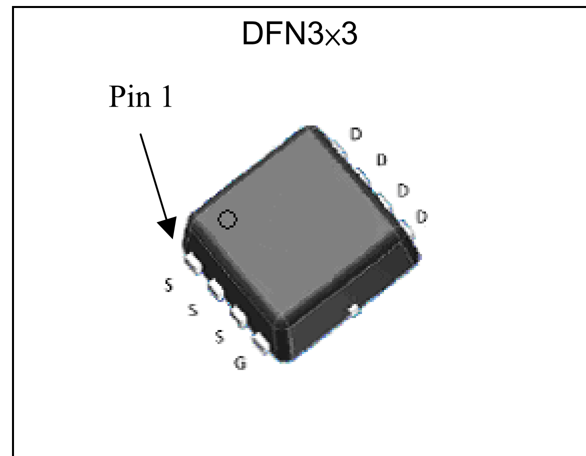
Features

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Pb-free lead plating and halogen-free package

Equivalent Circuit

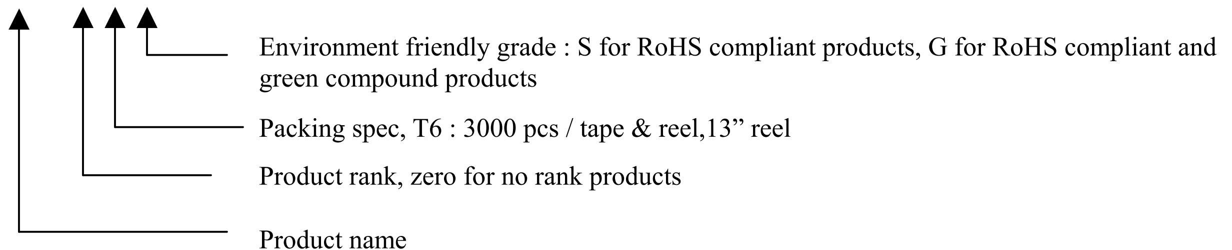


Outline



Ordering Information

Device	Package	Shipping
MTEJ0P20V8-0-T6-G	DFN3x3 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel



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

Parameter			Symbol	Limits	Unit
Drain-Source Voltage			V_{DS}	-200	V
Gate-Source Voltage			V_{GS}	±30	
Continuous Drain Current @ T_C=25°C, V_{GS}=-10V			I_D	-3.9	A
Continuous Drain Current @ T_C=70°C, V_{GS}=-10V				-3.1	
Continuous Drain Current @ T_A=25°C, V_{GS}=-10V		*3, 4		-1.3	
Continuous Drain Current @ T_A=70°C, V_{GS}=-10V		*3, 4		-1.0	
Pulsed Drain Current		*1, 2	I_{DM}	-6.0	
Continuous Source-Drain Diode Current	T_C=25℃		I_S	-5	
	T_A=25℃			-3	
Avalanche Current			I_{AS}	-5	
Avalanche Energy @ L=2mH, I_D=-5A, R_G=25Ω			E_{AS}	25	mJ
Maximum Power Dissipation	T_C=25℃		P_D	33	W
	T_C=70℃			21	
	T_A=25℃	*3, 4		3.7	
	T_A=70℃	*3, 4		2.4	
Operating Junction and Storage Temperature Range			Tj, Tstg	-55~+150	°C

Thermal Data

Parameter			Symbol	Typ	Maximum	Unit
Thermal Resistance, Junction-to-ambient	*3	t≤10s	$R_{th,j-a}$	28	34	°C/W
		Steady State		65	81	
Thermal Resistance, Junction-to-case			$R_{th,j-c}$	2.9	3.8	

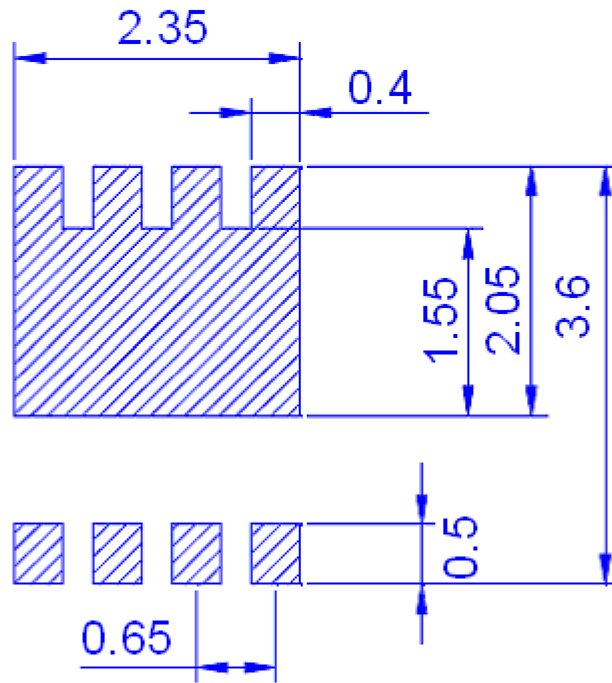
Note : 1. Pulse width limited by maximum junction temperature.
2. Duty cycle≤1%.
3. Surface mounted on 1 in² copper pad of FR-4 board.
4. t≤10s.

Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-200	-	-	V	V_{GS}=0V, I_D=-250μA
$\Delta BV_{DSS}/T_J$	-	-160	-	mV/°C	I_D=-250μA
$\Delta V_{GS(th)}/T_J$	-	-7.3	-		
$V_{GS(th)}$	-2	-3	-4	V	V_{DS} =V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±30V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS} =-200V, V_{GS} =0V
	-	-	-10		V_{DS} =-200V, V_{GS} =0V, T_J=55°C
$R_{DS(ON)}$ *1	-	0.80	1.0	Ω	V_{GS} =-10V, I_D=-1A
	-	0.85	1.1		V_{GS} =-6V, I_D=-1A
G_{FS} *1	-	2	-	S	V_{DS} =-15V, I_D=-1A
Dynamic					
Qg(V_{GS}=-10V) *1, 2	-	11	18	nC	V_{DS}=-100V, I_D=-1A,V_{GS}=-10V
Qg(V_{GS}=-6V) *1, 2	-	7.7	12		
Qgs *1, 2	-	2.0	-		
Qgd *1, 2	-	4.2	-		
$t_{d(ON)}$ *1, 2	-	13	20	ns	V_{DS}=-100V, I_D=-1A, V_{GS}=-10V, R_G=1Ω
tr *1, 2	-	7	11		
$t_{d(OFF)}$ *1, 2	-	21	32		
t_f *1, 2	-	11	17		
$t_{d(ON)}$ *1, 2	-	13	20	ns	V_{DS}=-100V, I_D=-1A, V_{GS}=-6V, R_G=1Ω
tr *1, 2	-	20	30		
$t_{d(OFF)}$ *1, 2	-	15	23		
t_f *1, 2	-	11	17		
Ciss	-	765	-	pF	V_{DS}=-50V, V_{GS}=0V, f=1MHz
Coss	-	29	-		
Crss	-	12	-		
Rg	-	13	16	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	-5	A	T_C=25°C
I_{SM} *3	-	-	-5		
V_{SD} *1	-	-0.79	-1.2	V	I_F=-1A, V_{GS}=0V
trr	-	72	100	ns	I_F=-4A, dI_F/dt=100A/μs
Qrr	-	240	310	nC	
ta		52		ns	
tb		20			

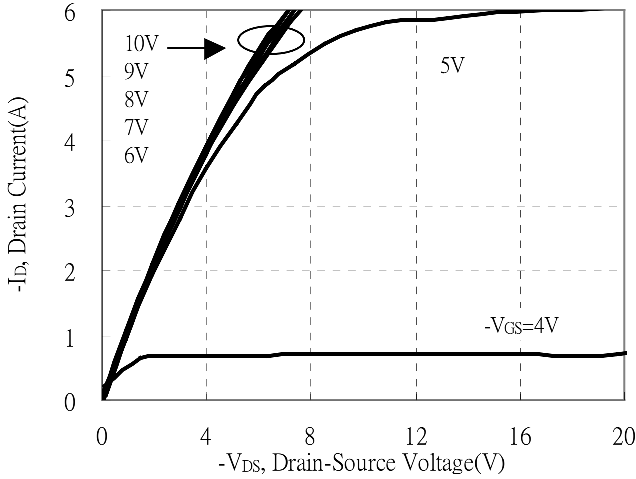
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

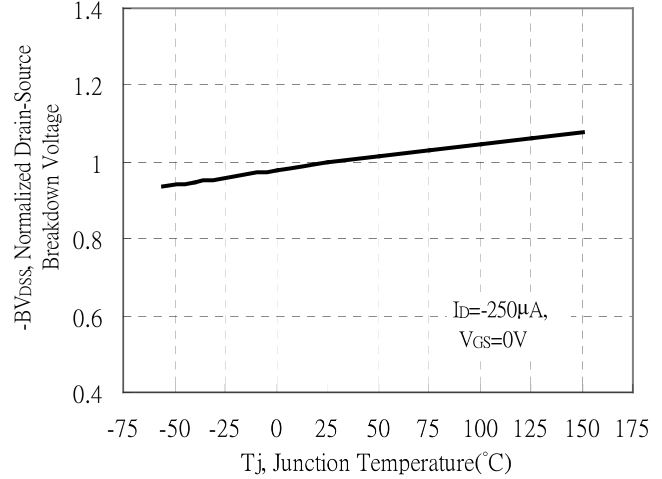
Recommended Soldering Footprint

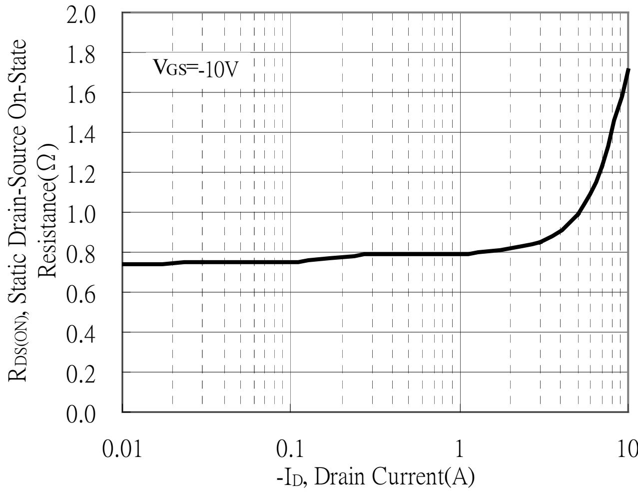


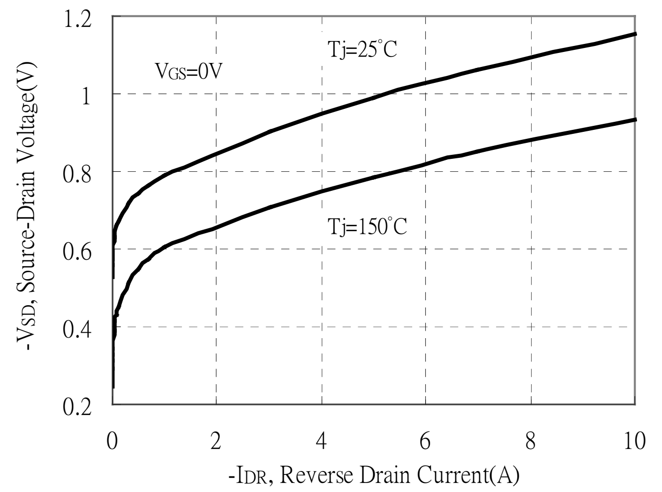
unit : mm

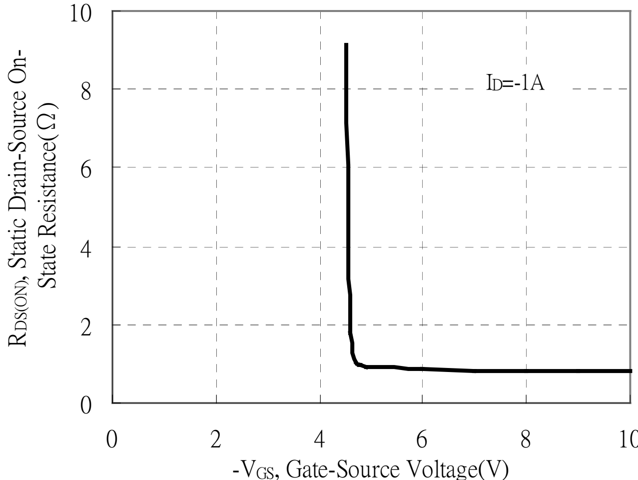
Typical Characteristics

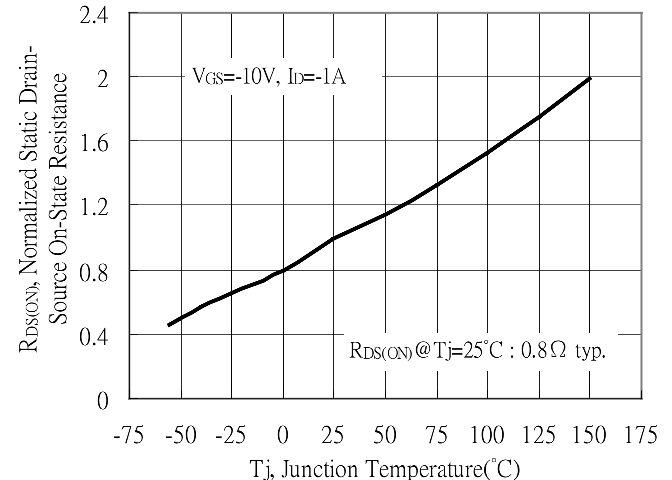




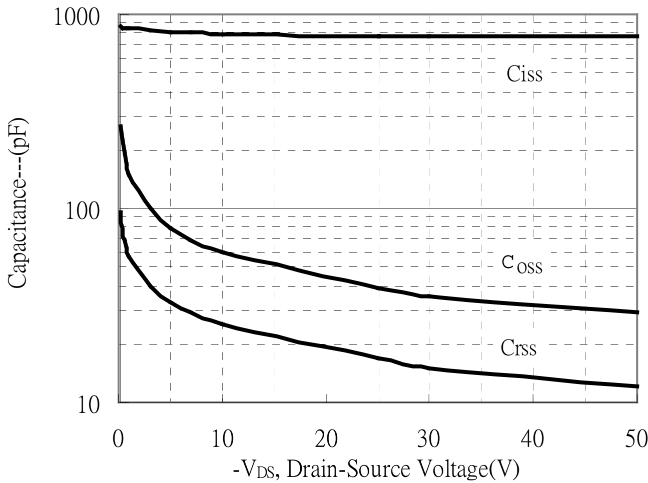


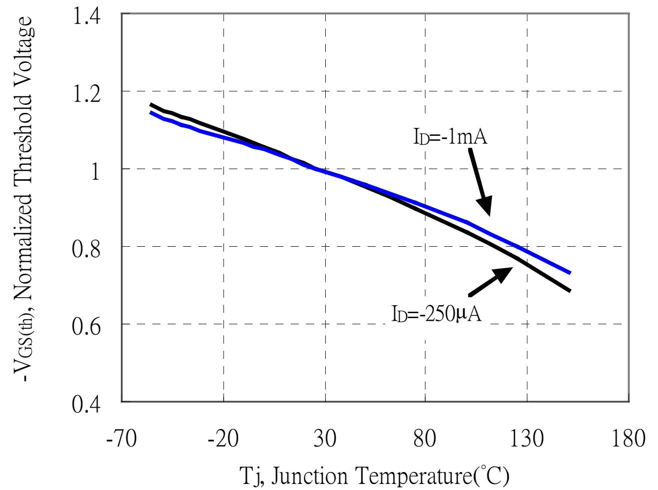


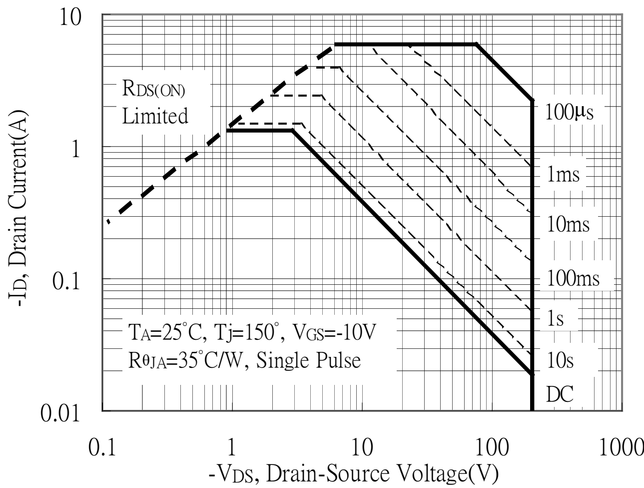


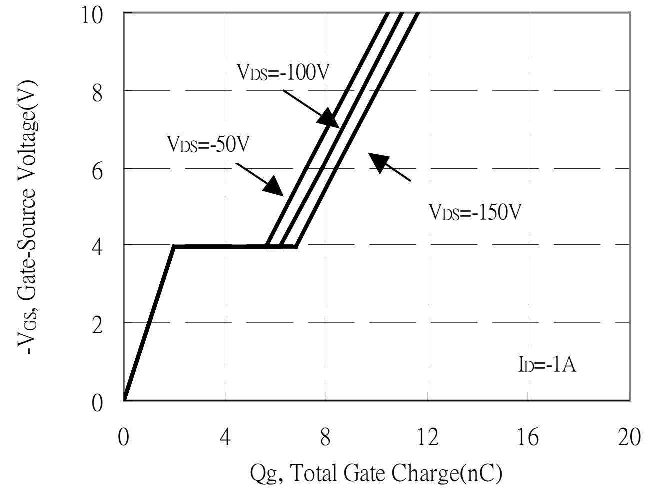


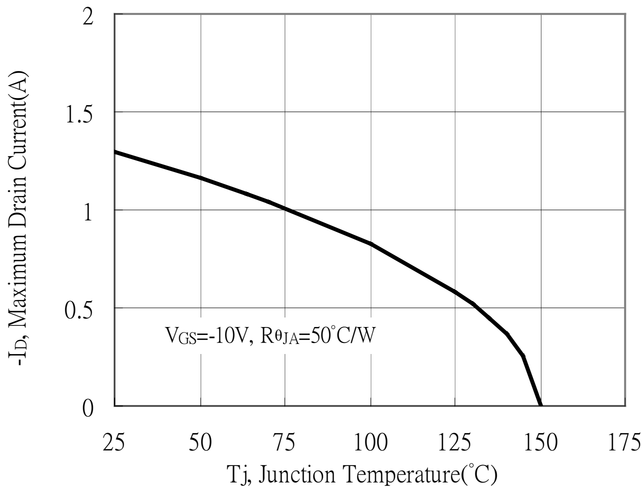
Typical Characteristics(Cont.)

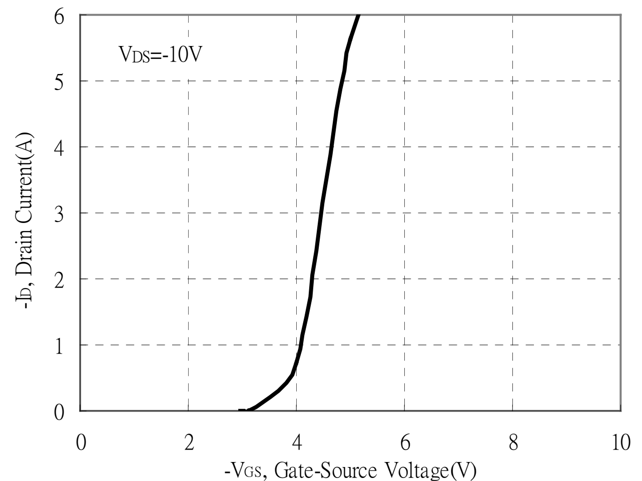












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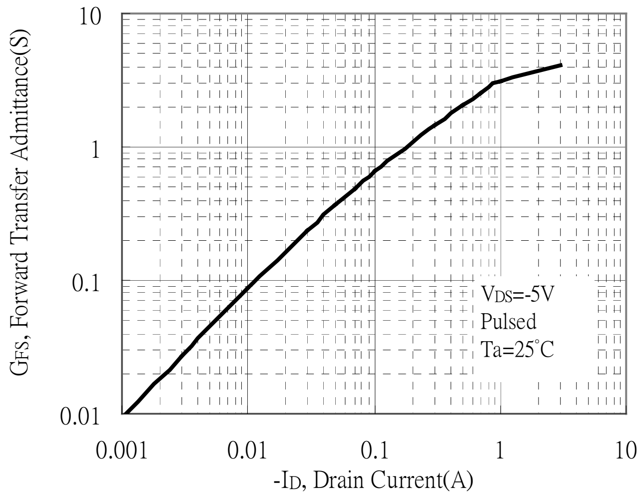
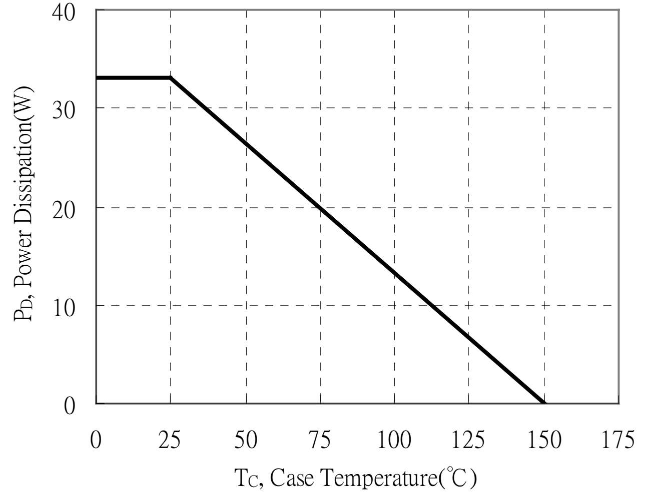
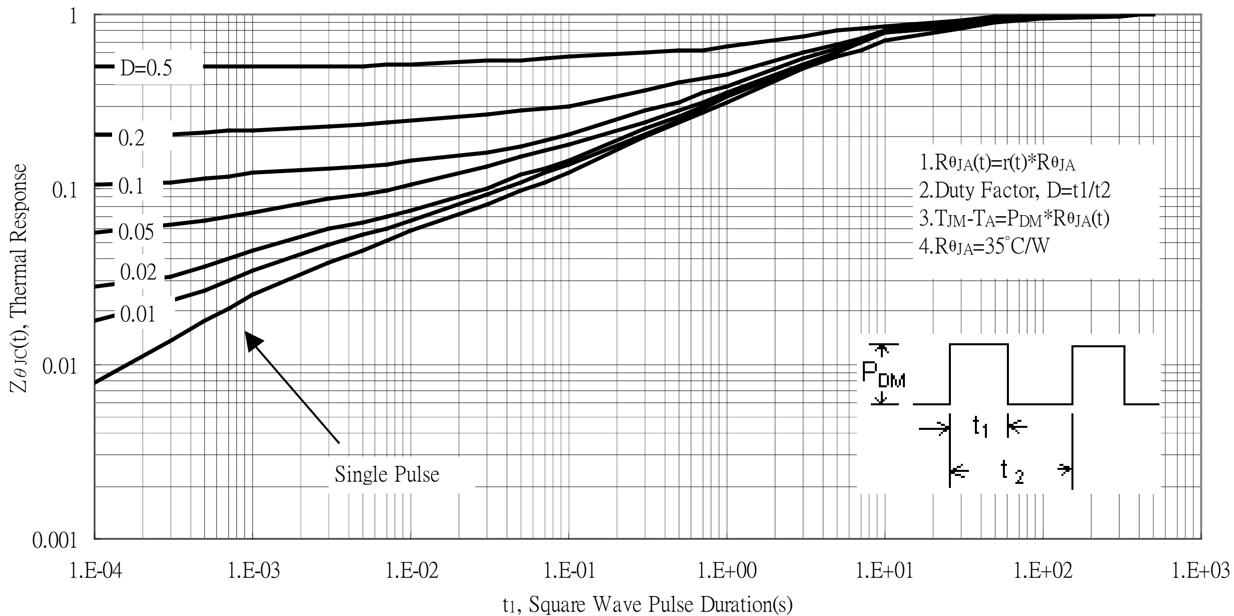
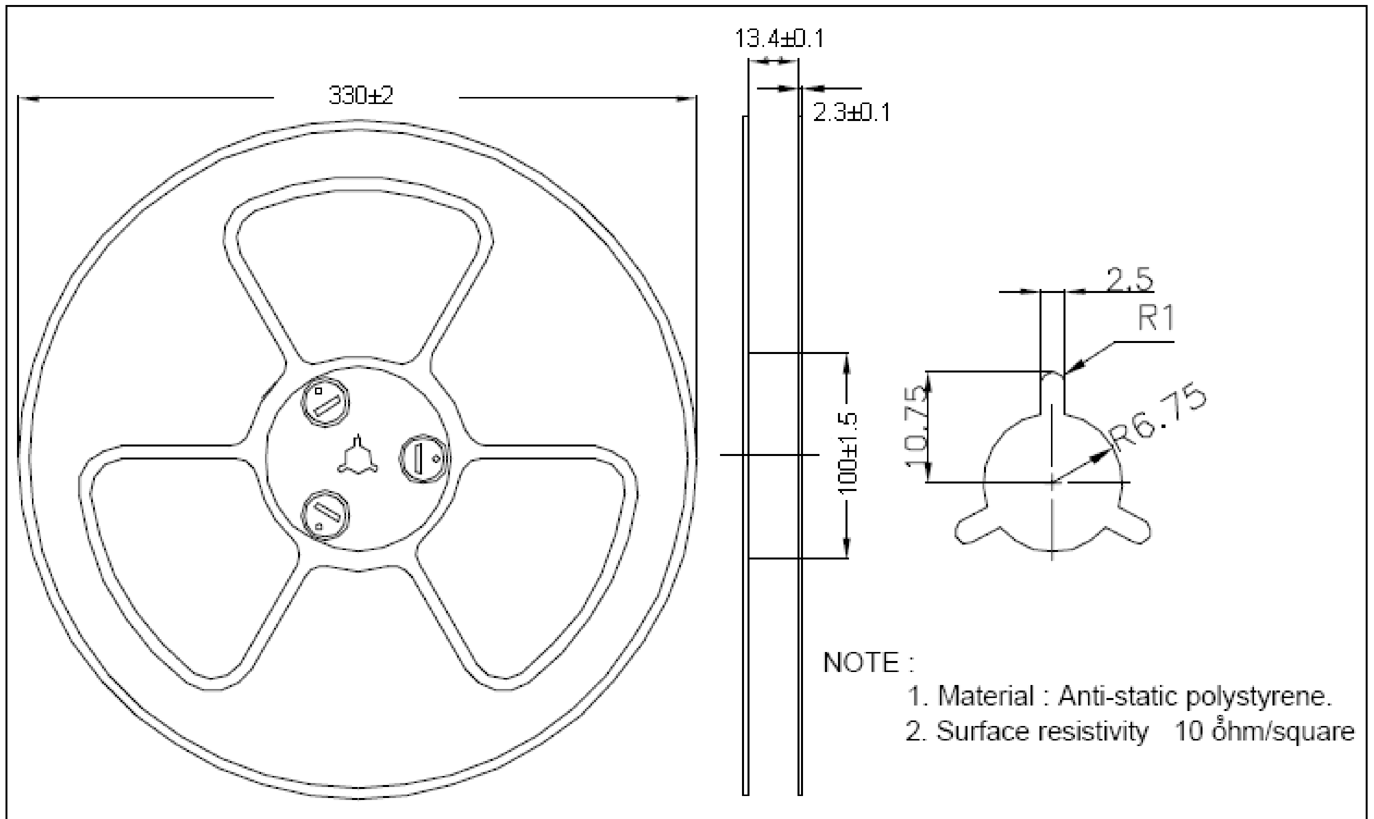


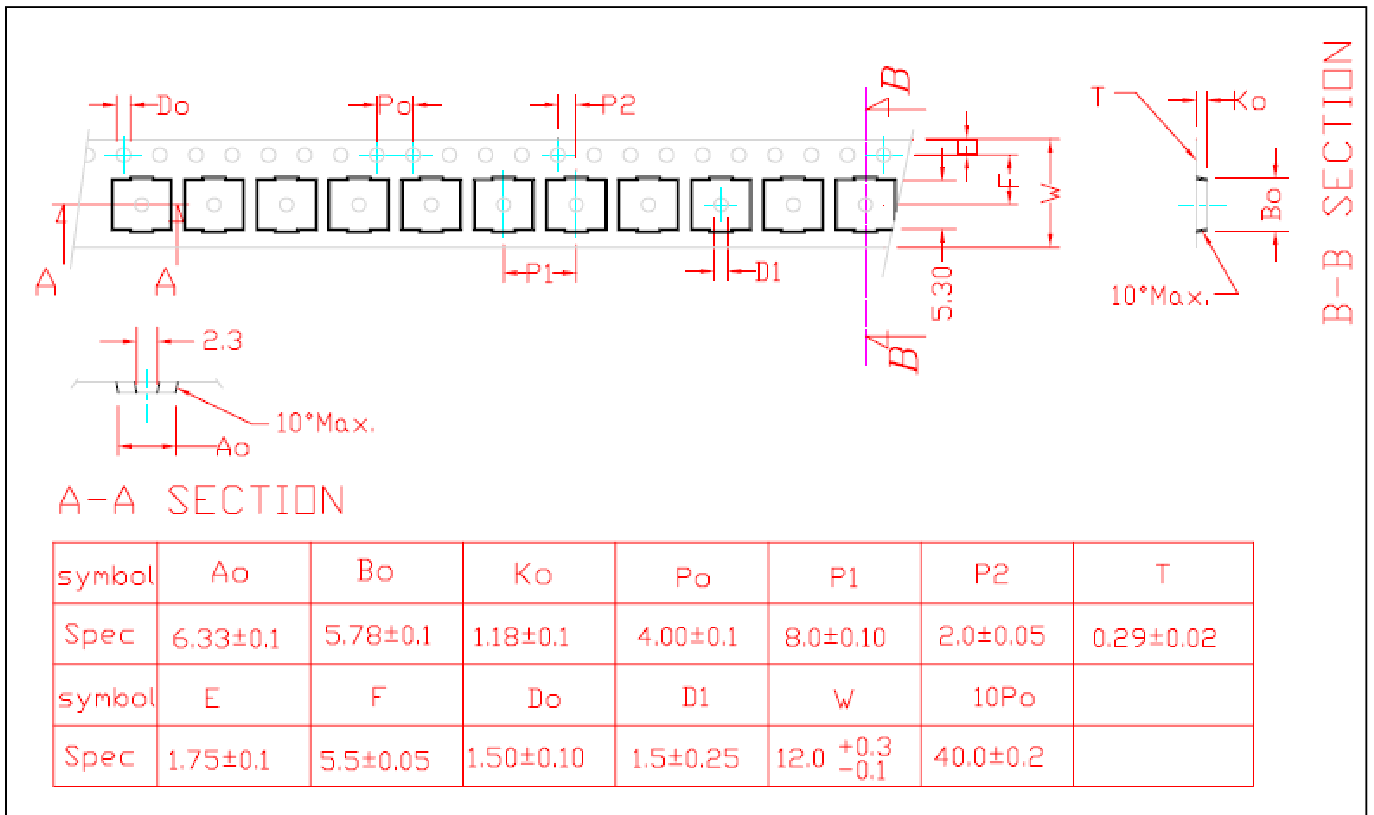




Reel Dimension



Carrier Tape Dimension

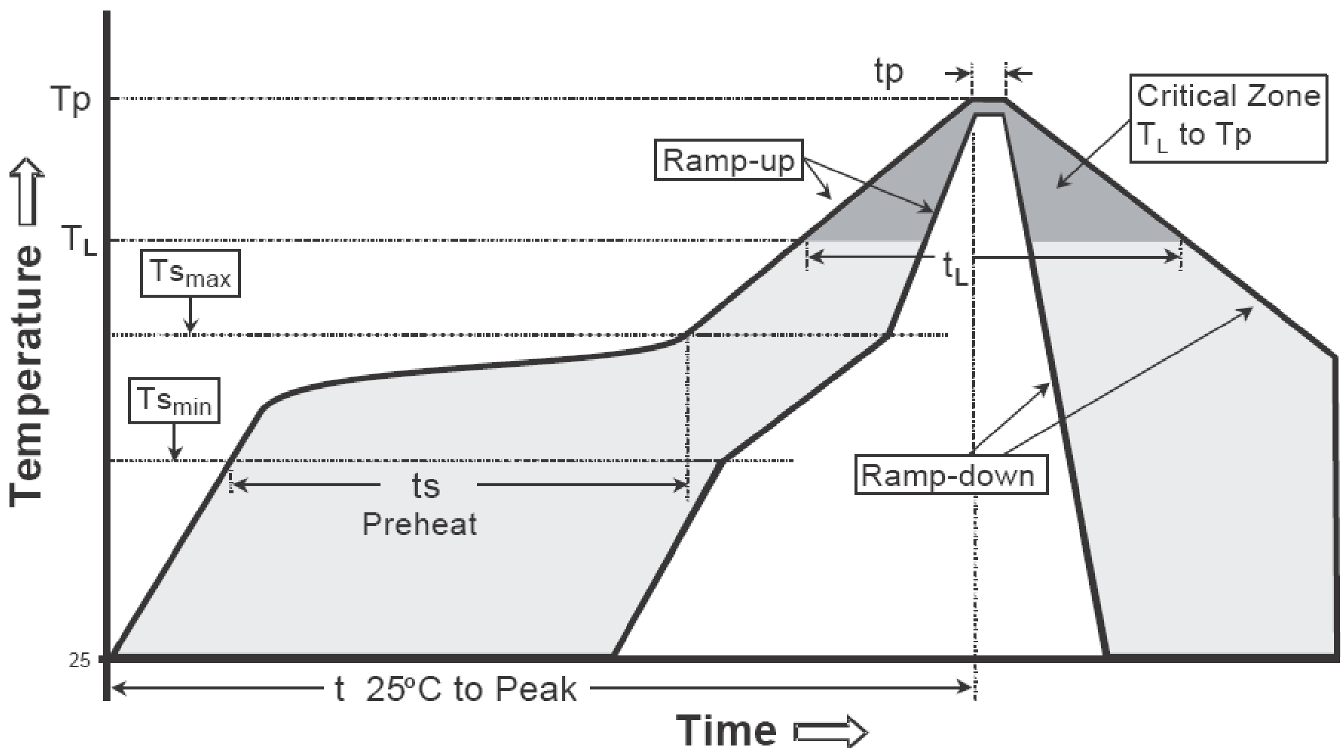


symbol	Ao	Bo	Ko	Po	P1	P2	T
Spec	6.33±0.1	5.78±0.1	1.18±0.1	4.00±0.1	8.0±0.10	2.0±0.05	0.29±0.02
symbol	E	F	Do	D1	W	10Po	
Spec	1.75±0.1	5.5±0.05	1.50±0.10	1.5±0.25	12.0 $^{+0.3}_{-0.1}$	40.0±0.2	

Recommended wave soldering condition

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

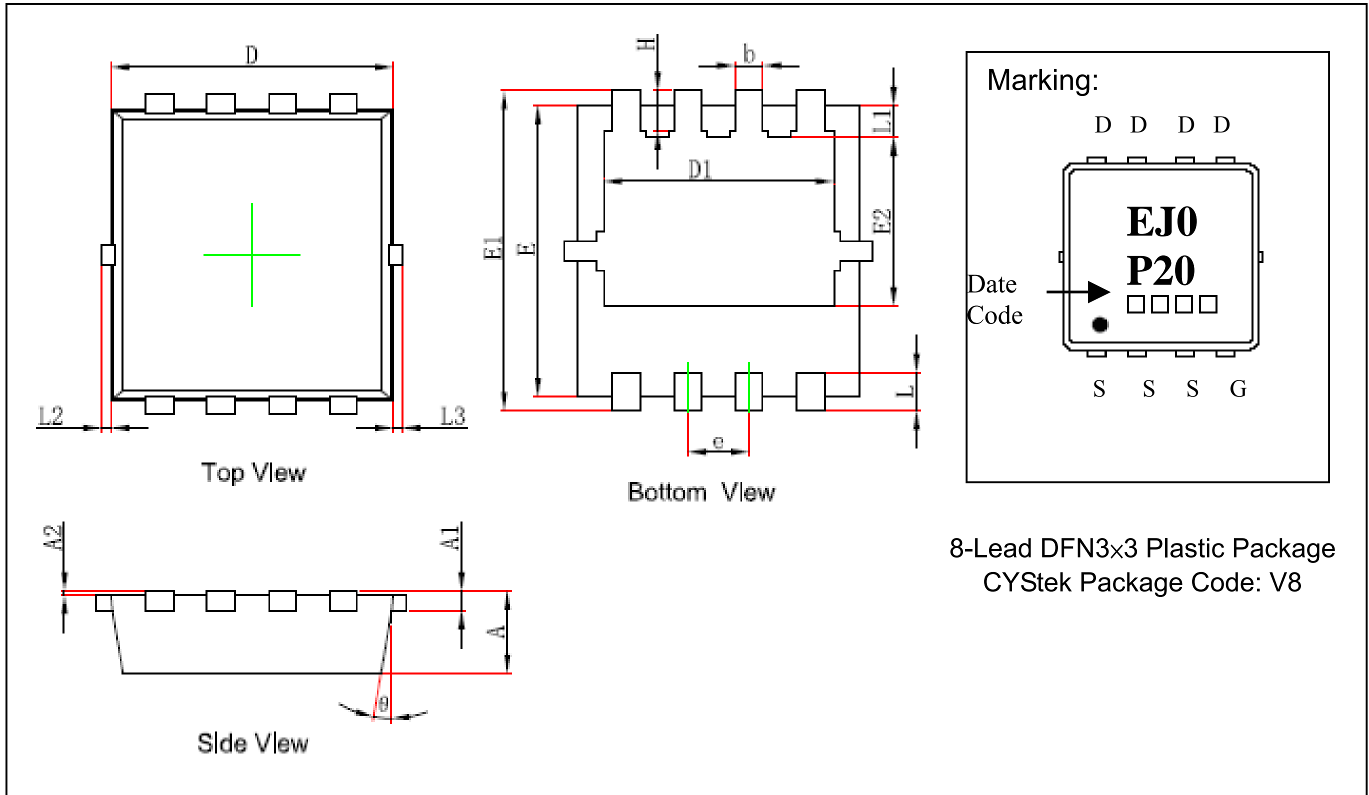
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(T_P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	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 : All temperatures refer to topside of the package, measured on the package body surface.

DFN3x3 Dimension



8-Lead DFN3x3 Plastic Package
CYStek Package Code: V8

*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.605	0.850	0.026	0.033	b	0.200	0.400	0.008	0.016
A1	0.152 REF		0.006 REF		e	0.550	0.750	0.022	0.030
A2	0.000	0.050	0.000	0.002	L	0.300	0.500	0.012	0.020
D	2.900	3.100	0.114	0.122	L1	0.180	0.480	0.007	0.019
D1	2.300	2.600	0.091	0.102	L2	0.000	0.100	0.000	0.004
E	2.900	3.100	0.114	0.122	L3	0.000	0.100	0.000	0.004
E1	3.150	3.450	0.124	0.136	H	0.315	0.515	0.012	0.020
E2	1.535	1.935	0.060	0.076	θ	9°	13°	9°	13°

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

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

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