30V Dual Asymmetric N-Channel Enhancement Mode MOSFET

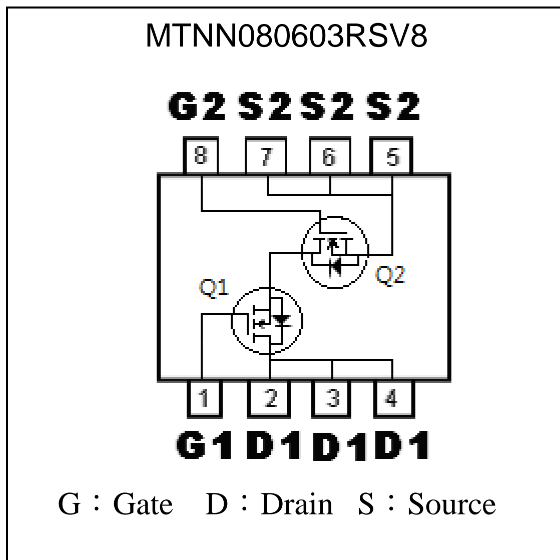
MTNN080603RSV8

	Q1	Q2
BV_{DSS}	30V	30V
I_D @T_C=25 °C, V_{GS}=10V	20A	30A
I_D @T_A=25 °C, V_{GS}=10V	12.8A	14.2A
R_{DSON}(typ.) @V_{GS}=10V	8.8mΩ	5.8mΩ
R_{DSON}(typ.) @V_{GS}=4.5V	12.0mΩ	8.8mΩ

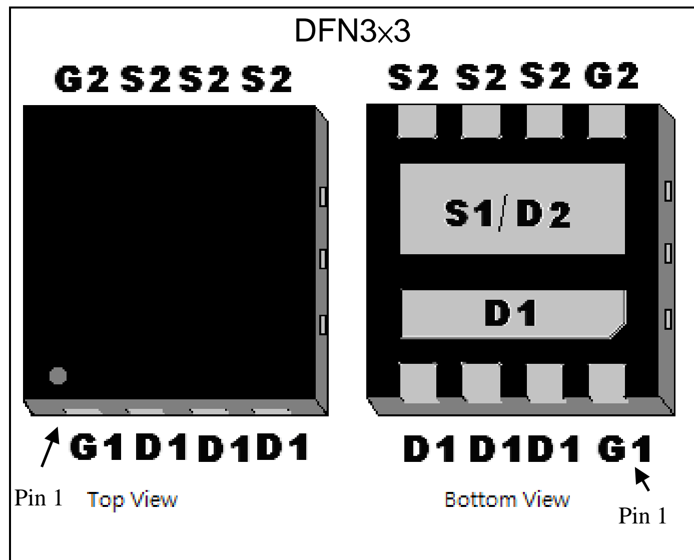
Features

- High Current Capability
- Low On-resistance
- Fast Switching Characteristic
- Low Gate Charge
- Pb-free lead plating and halogen-free package

Equivalent Circuit

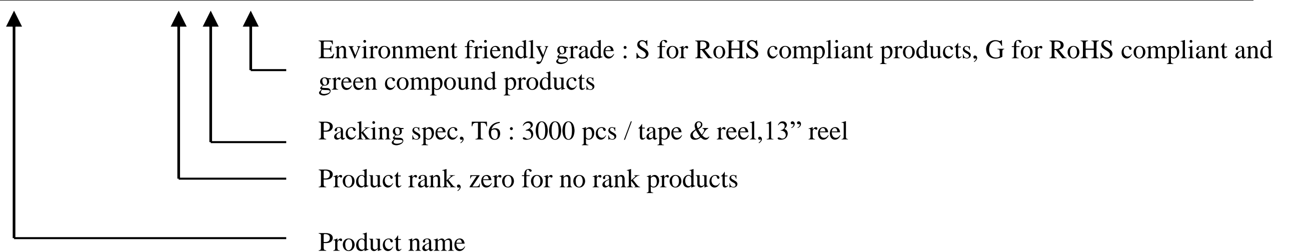


Outline



Ordering Information

Device	Package	Shipping
MTNN080603RSV8-0-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 Q1	Limits Q2	Unit
Drain-Source Breakdown Voltage		BV_{DSS}	30	30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_A=25 °C, V_{GS}=10V *2	I_{DSM}	12.8	14.2	A
	T_A=70 °C, V_{GS}=10V *2		10.2	12.7	
	T_A=25 °C, V_{GS}=10V		8.6	10	
	T_A=70 °C, V_{GS}=10V		6.9	8	
Continuous Drain Current	T_C=25 °C, V_{GS}=10V (silicon limit)	I_D	38	44	
	T_C=100 °C, V_{GS}=10V (silicon limit)		24	27.8	
	T_C=25 °C, V_{GS}=10V (package limit)		20	30	
Pulsed Drain Current * 1		I_{DM}	80	120	
Single Pulse Avalanche Current @ L=0.5mH		I_{AS}	8	9	
Single Pulse Avalanche Energy @ L=1mH *3		E_{AS}	32	32	mJ
Total Power Dissipation	T_A=25°C, t<10s	P_{DSM}	2.5	2.5	W
	T_A=70°C, t<10s		1.6	1.6	
	T_A=25°C, steady state		1.1	1.2	
	T_A=70°C, steady state		0.7	0.8	
	T_C=25°C	P_D	23	25	
	T_C=100°C		9.2	10	
Operating Junction and Storage Temperature Range		Tj; Tstg	-55~+150		°C

Thermal Data

Parameter	Symbol	Q1	Q2	Unit
Max. Thermal Resistance, Junction-to-ambient, t<10s *2	$R_{th,j-a}$	50	50	°C/W
Max. Thermal Resistance, Junction-to-ambient, steady state *2		110	100	
Max. Thermal Resistance, Junction-to-case	$R_{th,j-c}$	5.4	5	

Note : 1. Pulse width limited by maximum junction temperature.
2. Surface mounted on a 1 in² pad of 2oz copper, t≤10s. In practice $R_{th,j-a}$ will be determined by customer's PCB characteristics.
3. 100% tested by conditions of L=0.5mH, V_{DS}=15V, V_{GS}=10V, I_{AS}=3A

Q1 Electrical Characteristics (T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1.2	-	2.5	V	V_{DS} = V_{GS}, I_D=250μA
G_{FS} *1	-	10.2	-	S	V_{DS} =5V, I_D=10A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =24V, V_{GS} =0V
	-	-	10		V_{DS} =24V, V_{GS} =0V, Tj=55°C
$R_{DS(ON)}$ *1	-	8.8	12	mΩ	V_{GS} =10V, I_D=12A
	-	12	18		V_{GS} =4.5V, I_D=9A

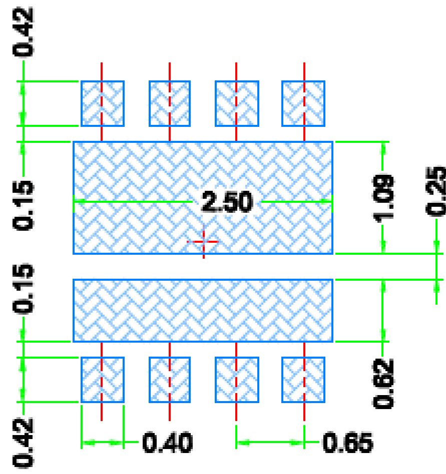
Dynamic					
Ciss	-	568	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	-	423	-		
Crss	-	53	-		
Qg *1, 2	-	10.6	-	nC	V_{DS}=15V, V_{GS}=10V, I_D=12A
Qgs *1, 2	-	2	-		
Qgd *1, 2	-	2.1	-		
$t_{d(ON)}$ *1, 2	-	6.8	-	ns	V_{DS}=15V, I_D=12A, V_{GS}=10V, R_{GS}=1Ω
t_r *1, 2	-	12.6	-		
$t_{d(OFF)}$ *1, 2	-	18.8	-		
t_f *1, 2	-	5.4	-		
Rg	-	0.6	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	20	A	
V_{SD} *1	-	0.85	1.1	V	I_S=10A, V_{GS}=0V
t_{rr}	-	15.8	-	ns	I_F=10A, V_{GS}=0V, dI_F/dt=100A/μs
Q_{rr}	-	5.2	-	nC	

Q2 Electrical Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1.2	-	2.5		V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1		V_{DS}=24V, V_{GS}=0V
	-	-	10		V_{DS}=24V, V_{GS}=0V, Tj=55°C
*$R_{DS(ON)}$	-	5.8	8.2	mΩ	V_{GS}=10V, I_D=15A
	-	8.8	13.5		V_{GS}=4.5V, I_D=10A
*G_{FS}	-	11.2	-	S	V_{DS}=5V, I_D=10A
Dynamic					
Ciss	-	767	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	-	505	-		
Crss	-	65	-		
*$t_{d(ON)}$	-	9.2	-	ns	V_{DS}=15V, I_D=15A, V_{GS}=10V, R_{GS}=1Ω
*t_r	-	12.6	-		
*$t_{d(OFF)}$	-	24.2	-		
*t_f	-	5.8	-		
*Qg	-	14	-	nC	V_{DS}=15V, I_D=15A, V_{GS}=10V
*Qgs	-	2.9	-		
*Qgd	-	2.8	-		
Rg	-	0.7	-	Ω	f=1MHz
Body Diode					
*I_S	-	-	22	A	
*V_{SD}	-	0.82	1.1	V	V_{GS}=0V, I_S=10A
*t_{rr}	-	18.8	-	ns	I_F=10A, V_{GS}=0V, dI_F/dt=100A/μs
*Q_{rr}	-	6.6	-	nC	

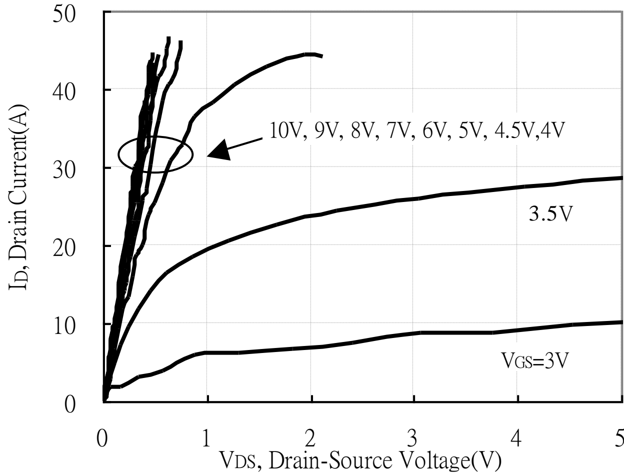
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

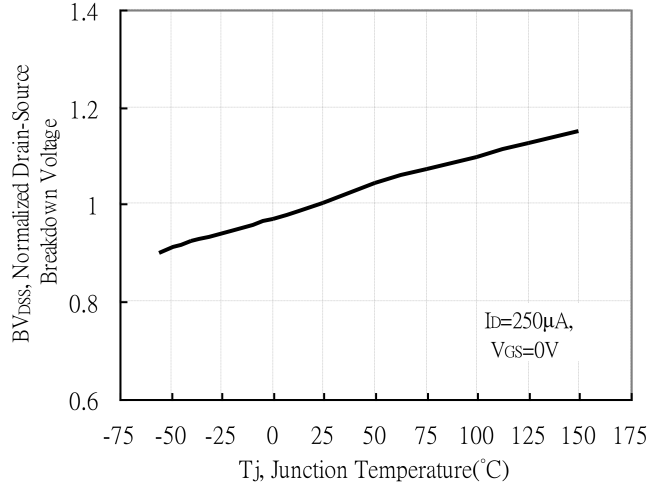
Recommended Soldering Footprint

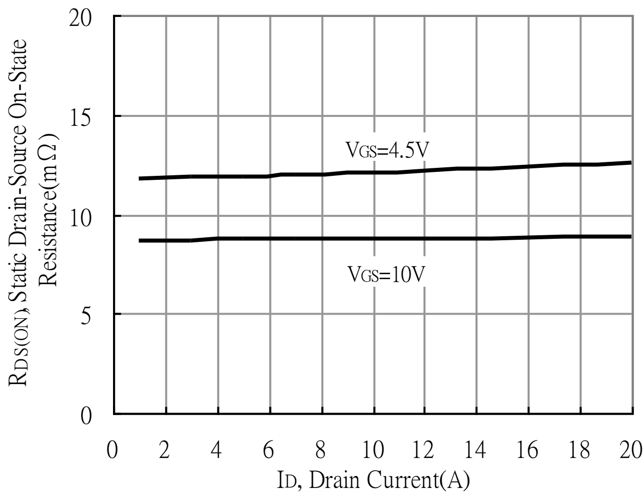


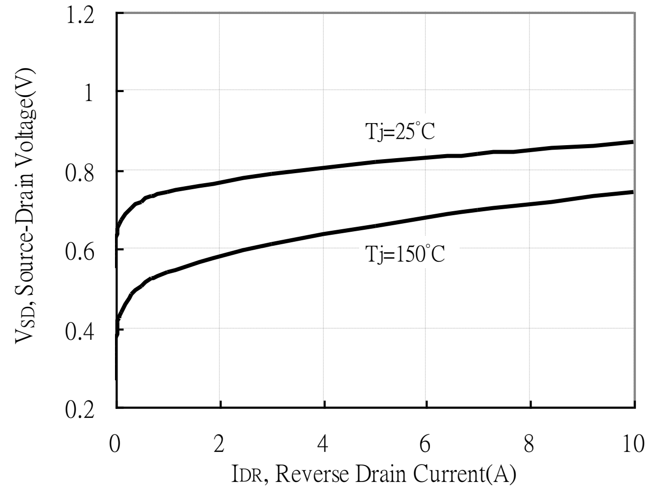
unit : mm

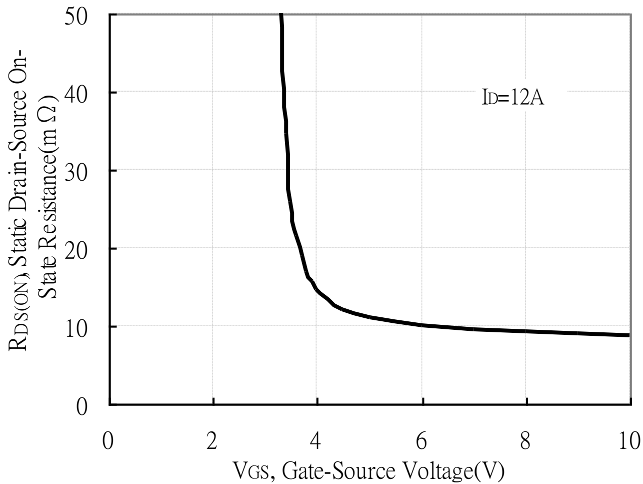
Typical Characteristics : Q1(N-channel)

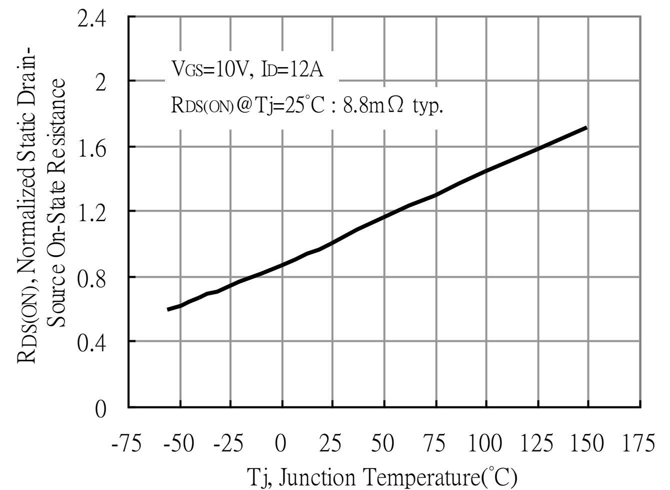




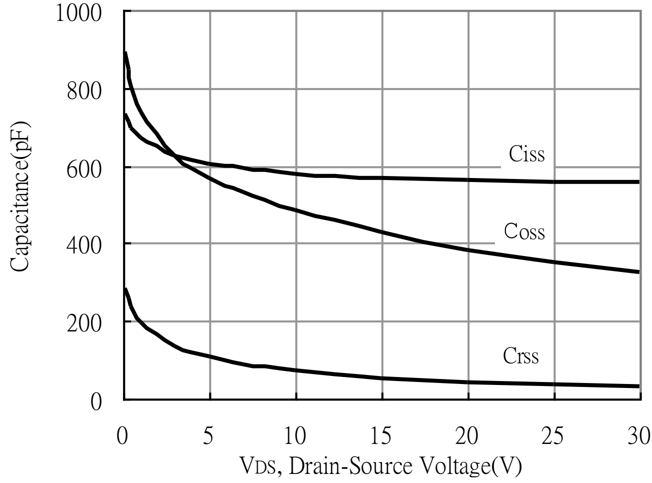


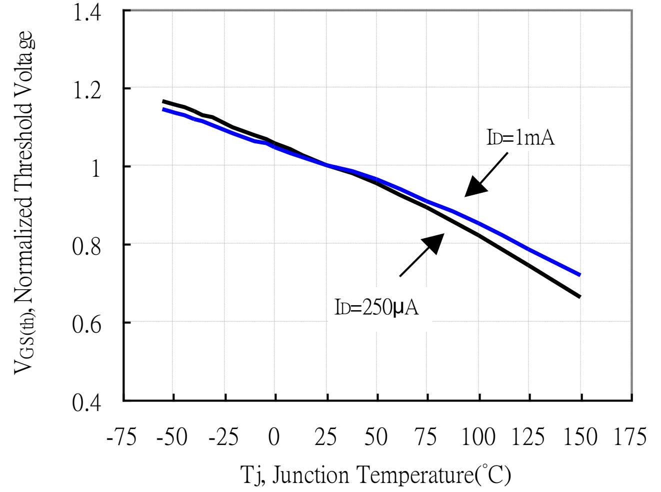


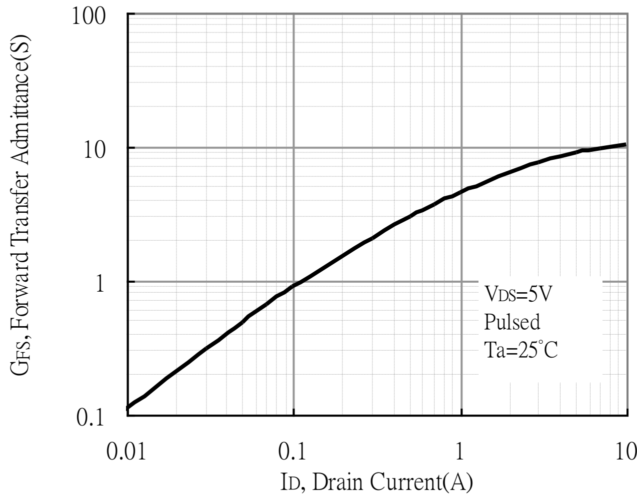


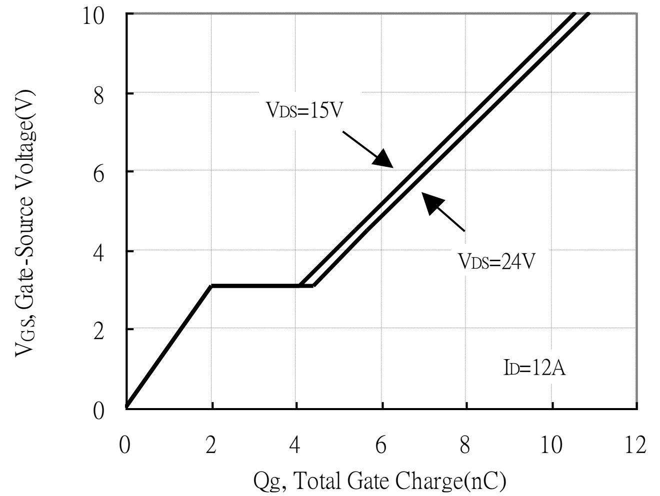


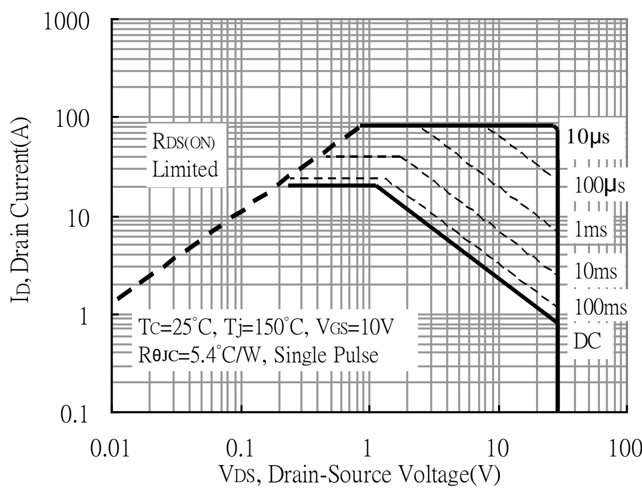
Typical Characteristics(Cont.) : Q1(N-channel)

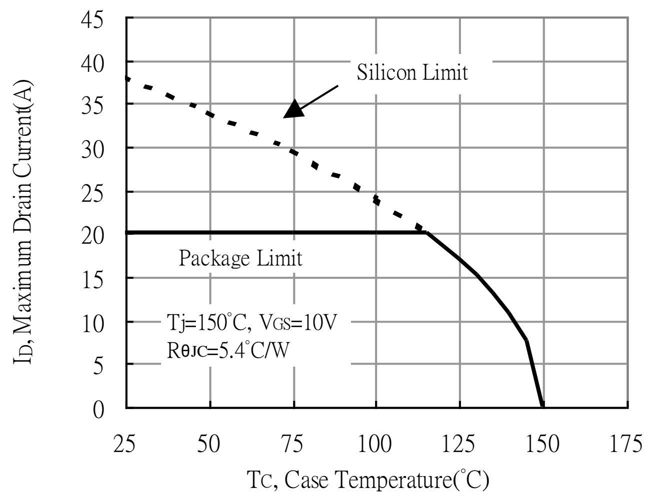




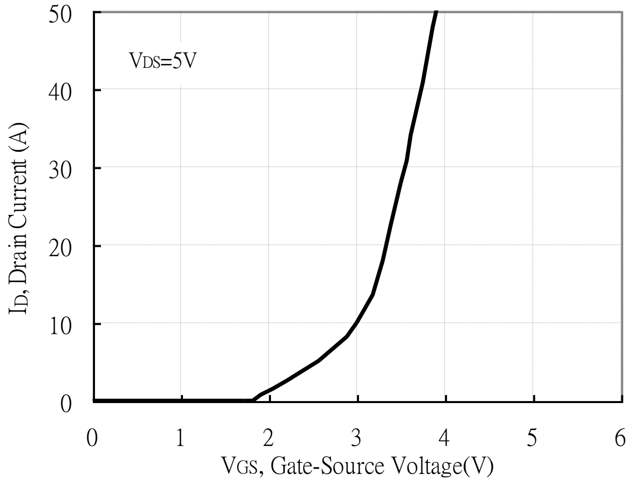


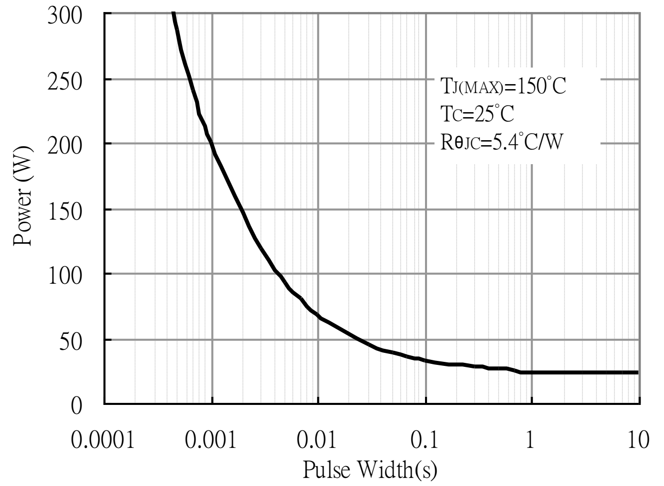


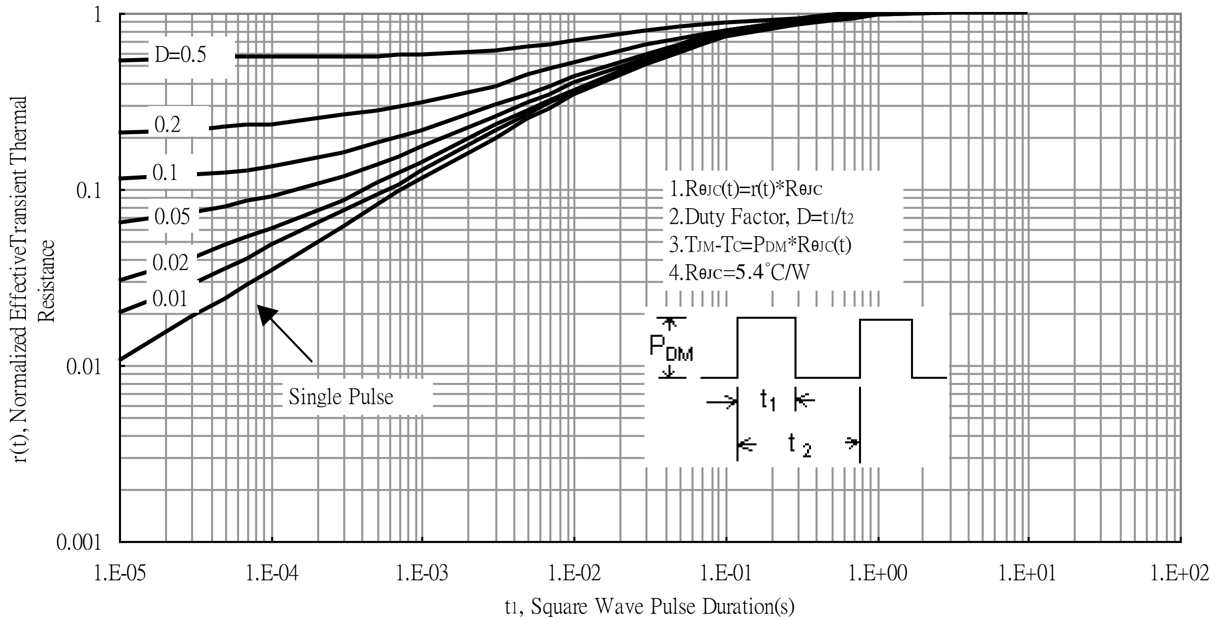




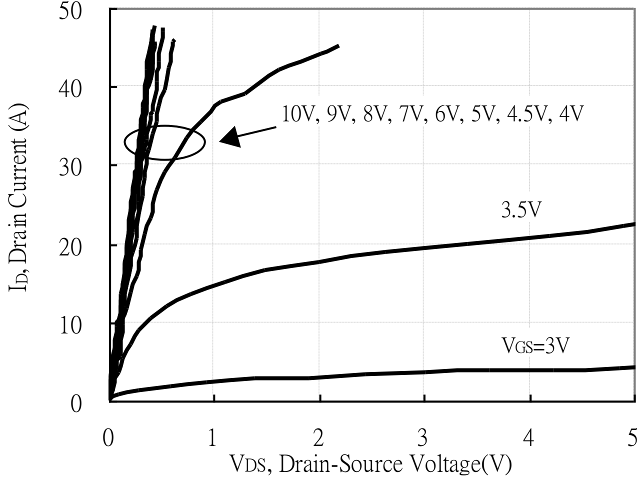
Typical Characteristics(Cont.) : Q1(N-channel)

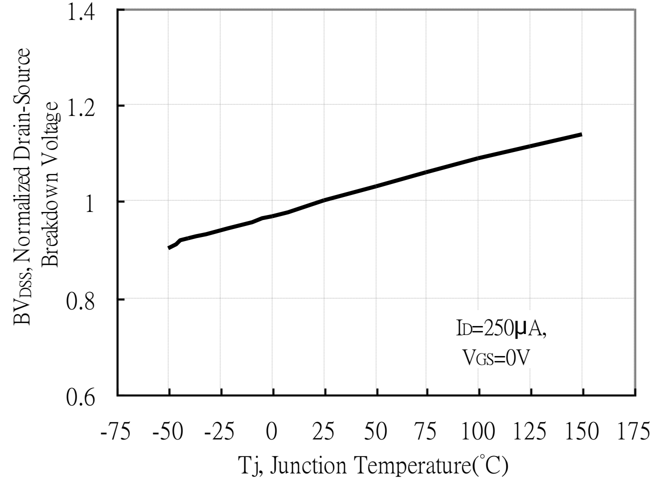


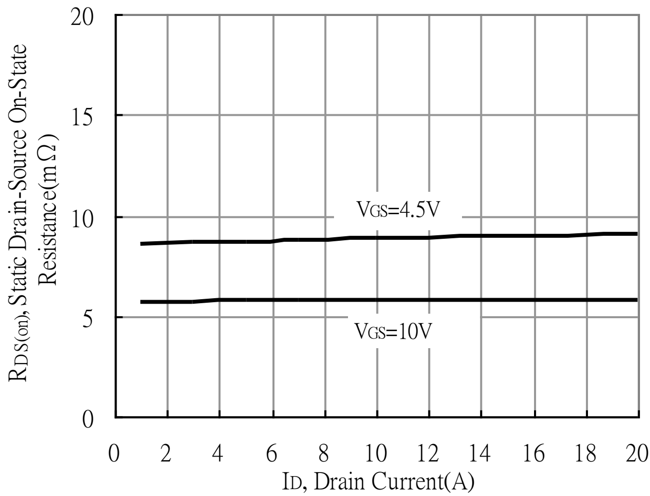


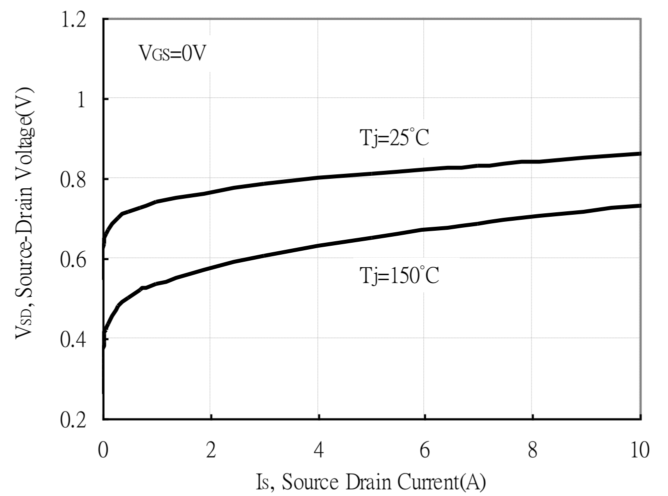


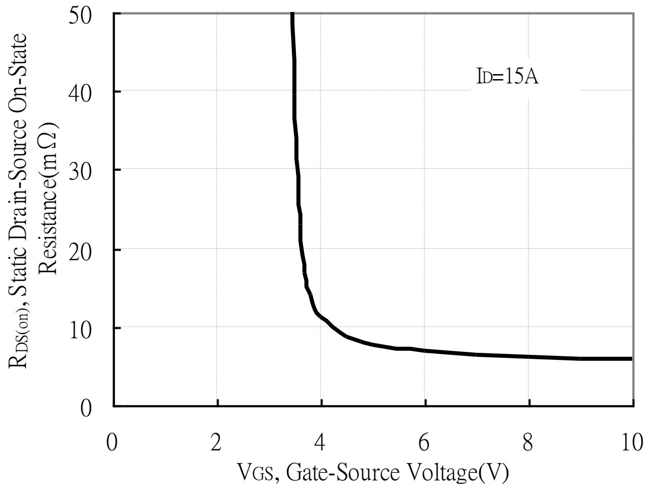
Typical Characteristics : Q2(N-channel)

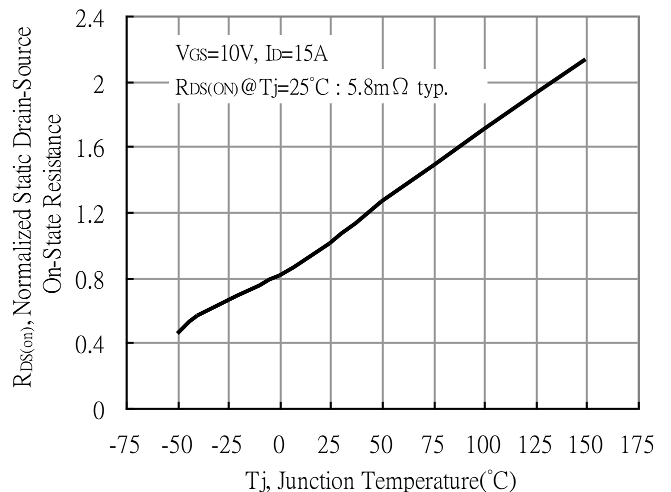




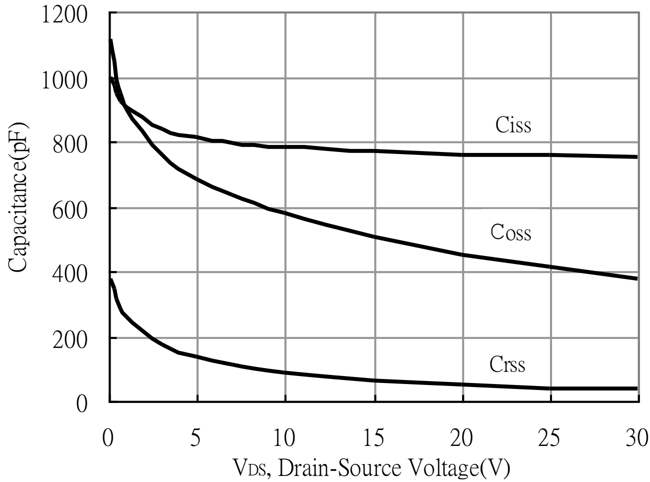


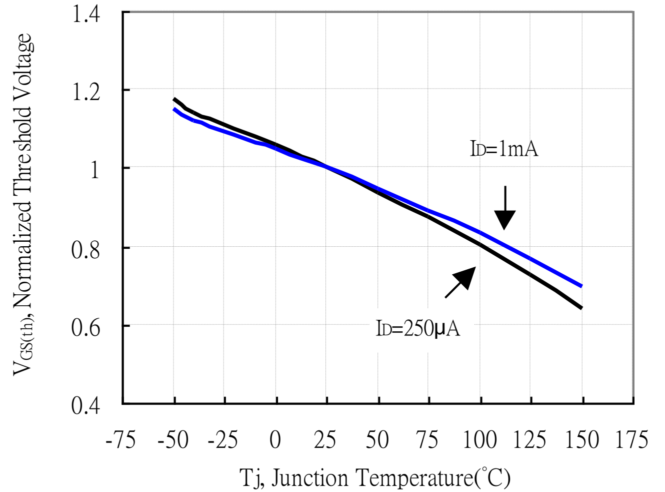


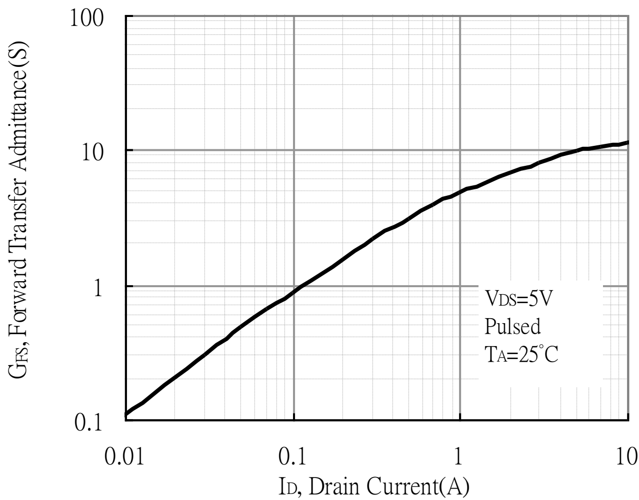


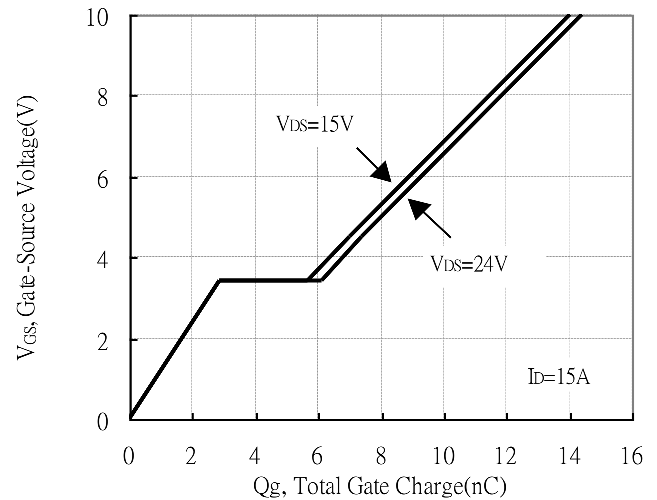


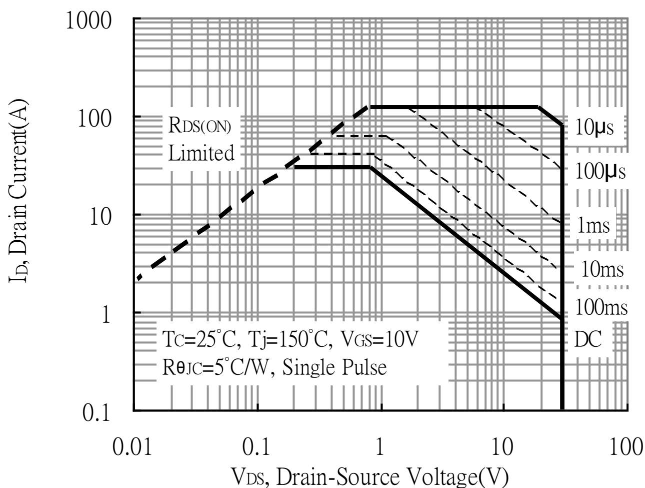
Typical Characteristics(Cont.) : Q2(N-channel)

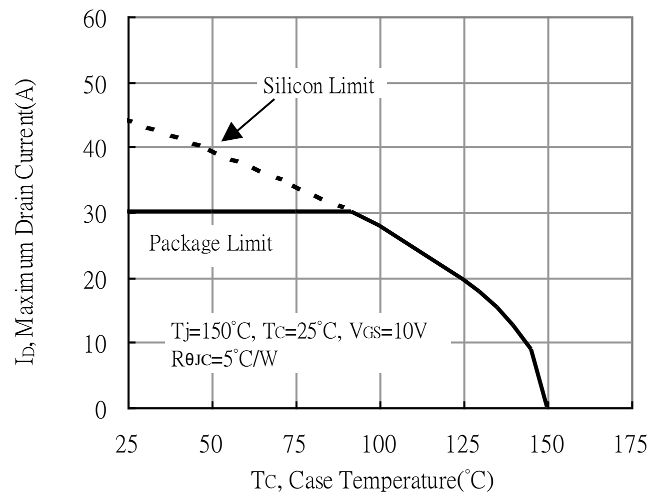




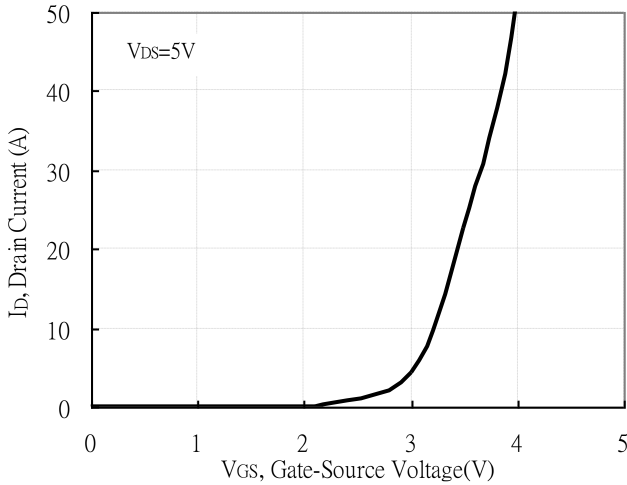


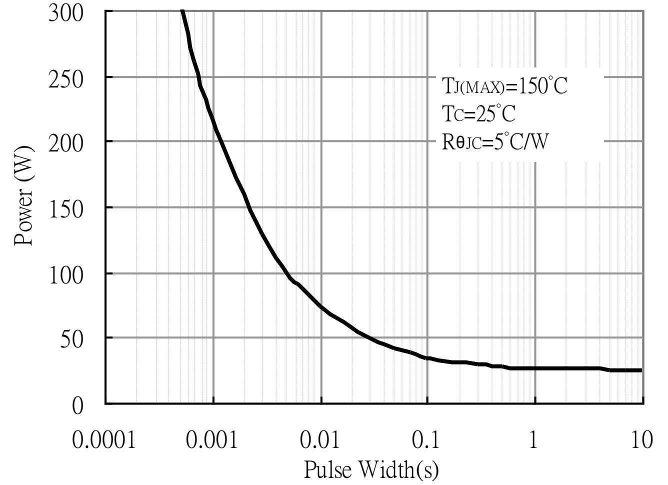


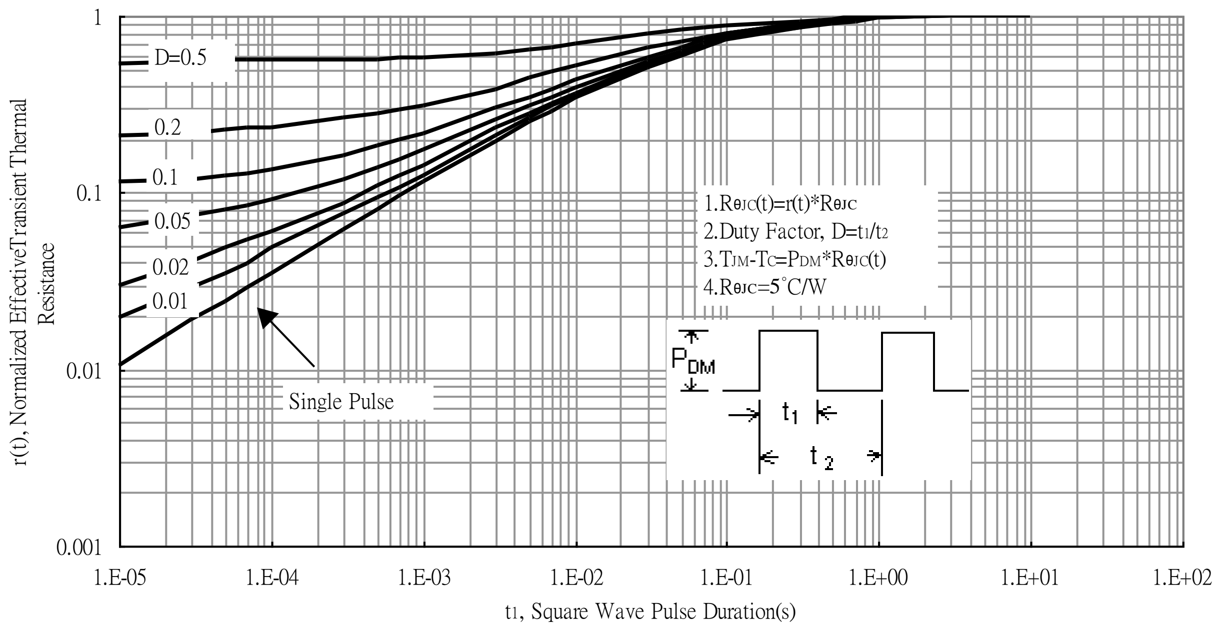




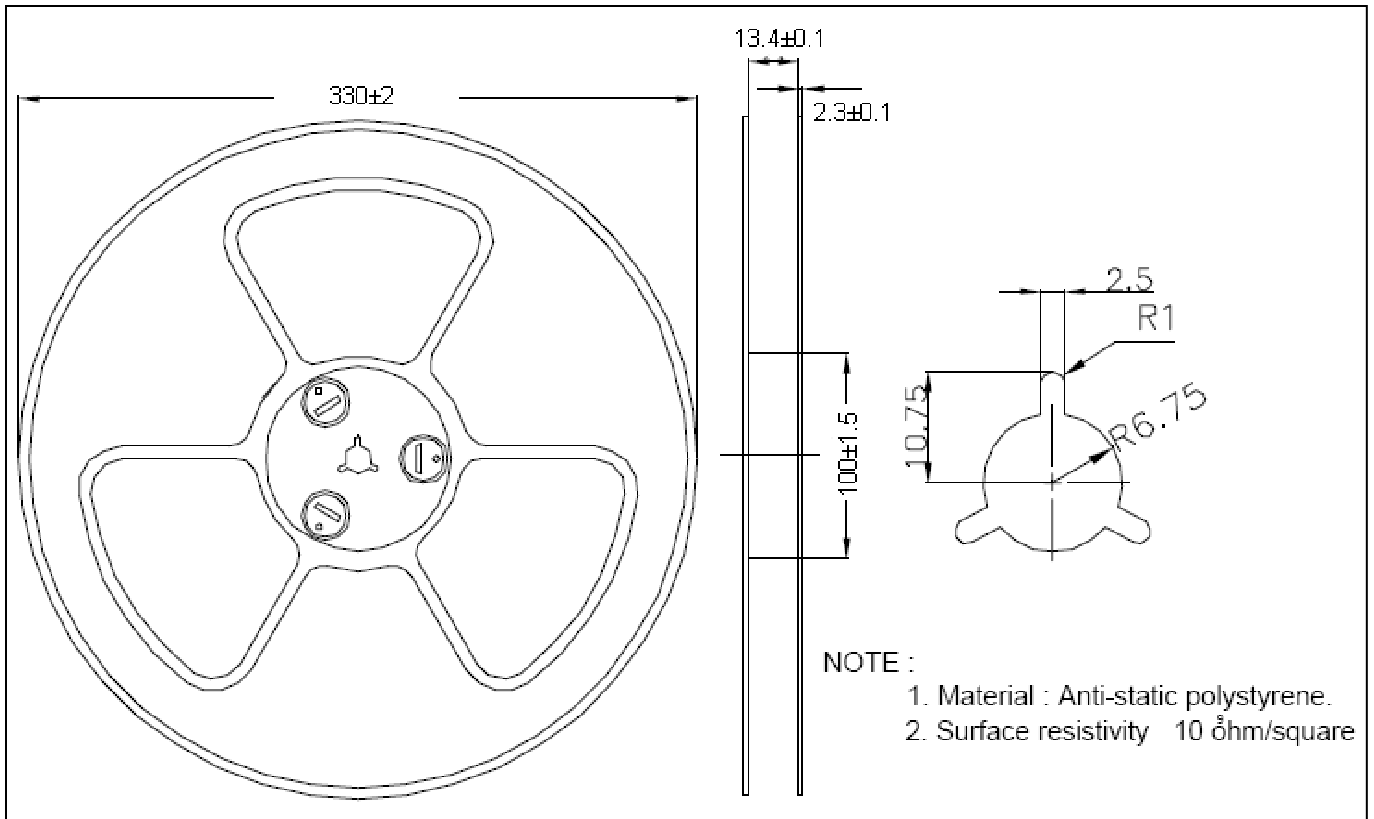
Typical Characteristics(Cont.) : Q2(P-channel)



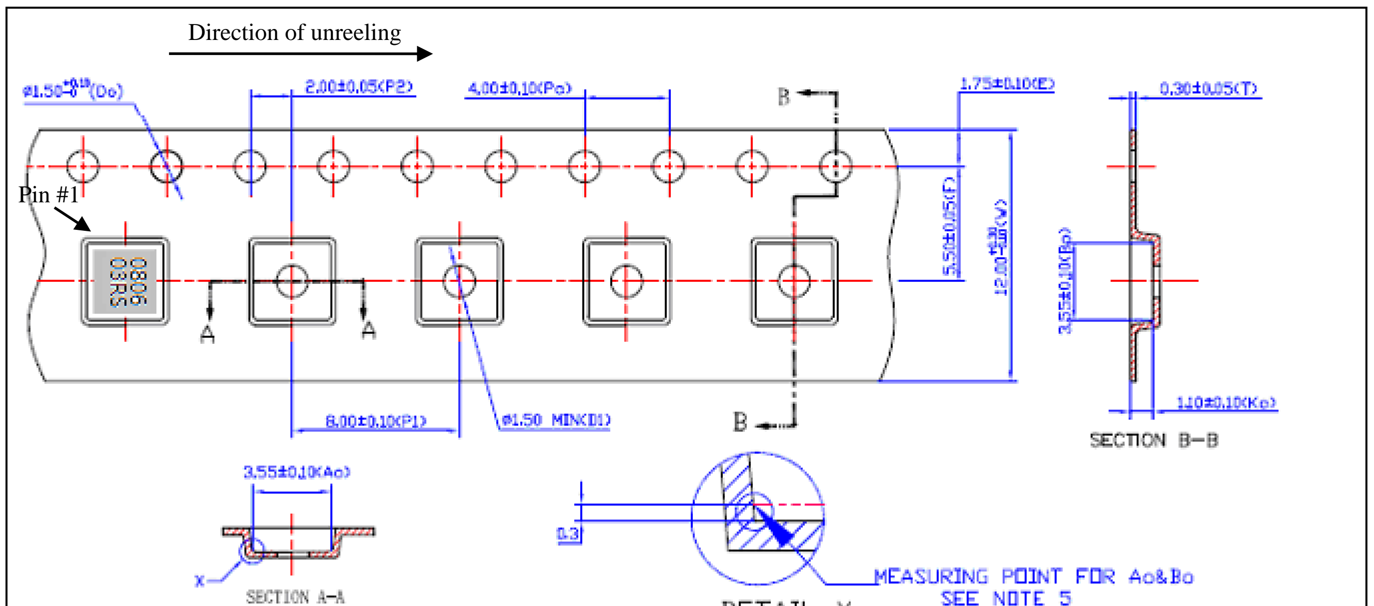




Reel Dimension



Carrier Tape

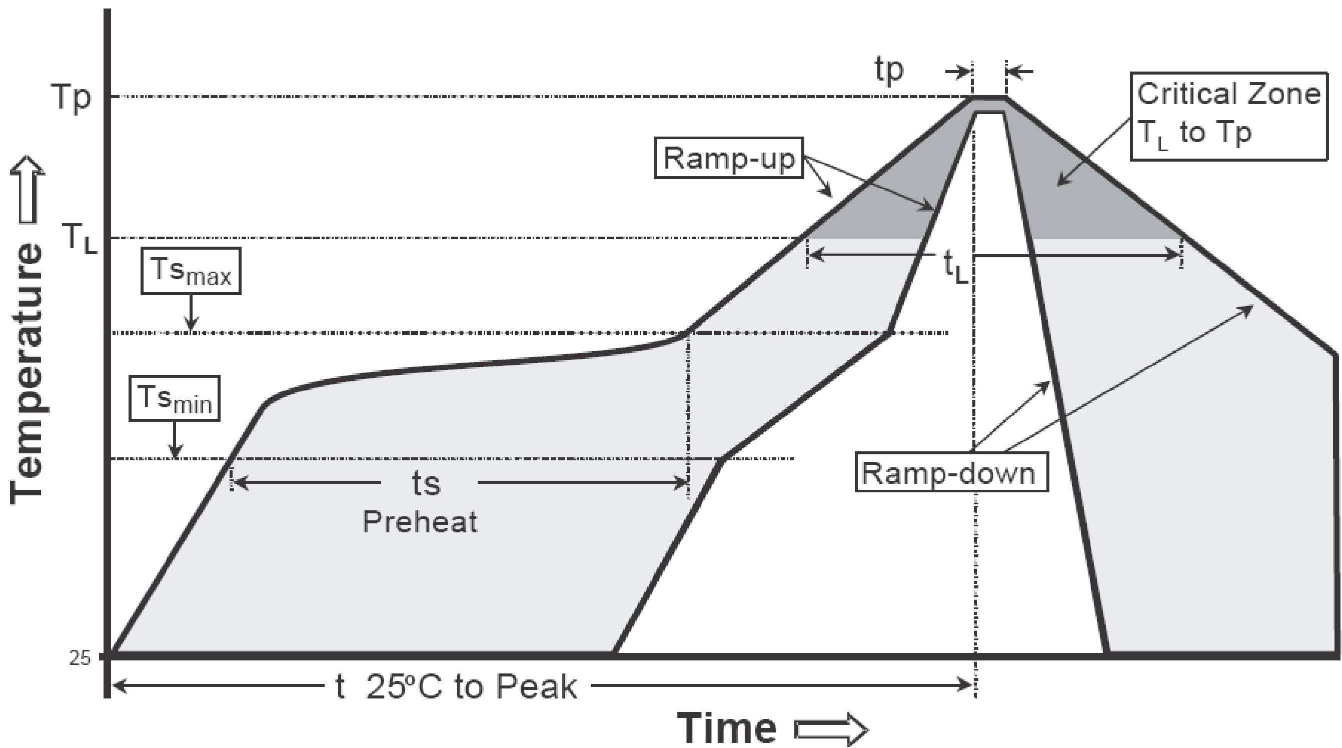


Note :
1.10 sprocket hole pitch cumulative tolerance : ±0.2mm.
2.Camber : Reference to carrier tape inspection manual.
3.Material : black conductive polystyrene.
4.All dimensions are in millimeters(unless otherwise specified).
5.Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
6.Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
7.Pocket position relative to sprocket hole measured as true position of the pocket, not pocket hole.
8.Surface resistivity : 1×10E4~1×10E11 ohms/sq

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

Note : 1.All dimensions are in mm.
2.Dimensions are not inclusive burrs and mold flash.

8-Lead DFN3x3 Plastic Package
CYStek Package Code: V8

Marking:

G2 S2 S2 S2
0806
03RS
□□□□X
G1 D1 D1 D1
Date Code
Assembly site code: blank→site 1 G→site 2

Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd code : month code, Jan→A, Feb→B, Mar→C, Apr→D May→E, Jun→F, Jul→G, Aug→H, Sep→J, Oct→K, Nov→L, Dec→M
3rd and 4th codes : production serial number, 01~99

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.70	0.80	0.028	0.032	E	2.90	3.10	0.114	0.122
A1	0.00	0.05	0.000	0.002	E1	2.20	2.40	0.087	0.094
b	0.35	0.45	0.014	0.018	E2	2.20	2.45	0.087	0.096
c	0.20 REF		0.008 REF		e	0.55	0.75	0.008	0.030
D	2.90	3.10	0.114	0.122	K	0.15	0.35	0.006	0.014
D1	0.40	0.60	0.016	0.024	K1	0.25	0.45	0.010	0.018
D2	0.85	1.05	0.033	0.041	L	0.27	0.40	0.011	0.016

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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