

N-Channel Enhancement Mode Power MOSFET

Features

- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

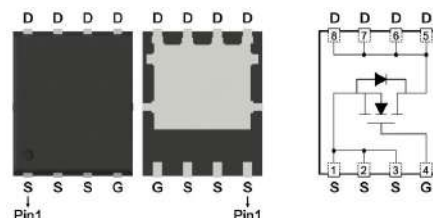
Product Summary

BV_{DSS}	100	V
$R_{DS(ON)}$ typ. @ $V_{GS}=10V$, $I_D=10A$	3.8	m Ω
I_D @ $V_{GS}=10V$, $T_C=25^\circ C$	84	A
I_D @ $V_{GS}=10V$, $T_A=25^\circ C$	17	

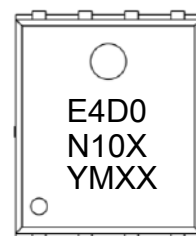
Ordering Information

Device	Package	Shipping
KPRE4D0N10X	DFN5 $\times$ 6	3000pcs / Tape & Reel

DFN5 $\times$ 6



Marking



← Device Code

← Date Code

YMXX: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99

Absolute Maximum Ratings ($T_A=25^\circ C$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current @ $V_{GS}=10V$, $T_C=25^\circ C$ (silicon limit)	I_D	98	A
Continuous Drain Current @ $V_{GS}=10V$, $T_C=25^\circ C$ (package limit)		84	
Continuous Drain Current @ $V_{GS}=10V$, $T_C=100^\circ C$		62	
Continuous Drain Current @ $V_{GS}=10V$, $T_A=25^\circ C$		17	
Continuous Drain Current @ $V_{GS}=10V$, $T_A=70^\circ C$		14	
Pulsed Drain Current	I_{DM}	288	A
Continuous Body Diode Forward Current @ $T_C=25^\circ C$	I_S	80	
Pulsed Body Diode Forward Current @ $T_C=25^\circ C$	I_{SM}	288	
Avalanche Current @ $L=0.1mH$	I_{AS}	45	
Avalanche Energy @ $L=0.5mH$	E_{AS}	170	mJ
Total Power Dissipation	$T_C=25^\circ C$	96	W
	$T_C=100^\circ C$	38	
	$T_A=25^\circ C$	2.8	
	$T_A=70^\circ C$	1.8	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ C$
Steady State Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.3	$^\circ C/W$
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	45	

Electrical Characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

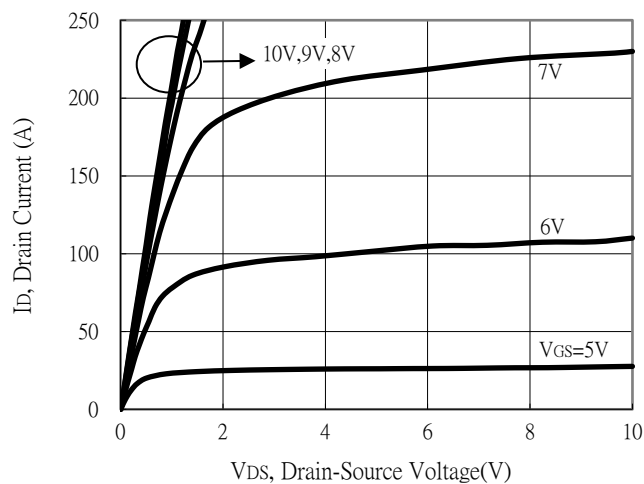
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	100	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	2	-	4		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	19	-	S	V _{DS} =10V, I _D =10A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =80V, V _{GS} =0V
R _{DS(ON)}	-	3.8	5	mΩ	V _{GS} =10V, I _D =10A
Dynamic					
C _{iss}	-	4130	-	pF	V _{DS} =50V, V _{GS} =0V, f=1MHz
C _{oss}	-	1360	-		
C _{rss}	-	55	-		
R _g	-	0.6	-	Ω	f=1MHz
Q _g *d,e	-	68	-	nC	V _{DS} =50V, I _D =10A, V _{GS} =10V
Q _{gs} *d,e	-	23	-		
Q _{gd} *d,e	-	18	-		
t _{d(ON)} *d,e	-	33	-	ns	V _{DS} =50V, I _D =10A, V _{GS} =10V, R _{GS} =1Ω
t _r *d,e	-	31	-		
t _{d(OFF)} *d,e	-	44	-		
t _f *d,e	-	14	-		
Source-Drain Diode					
V _{SD} *d	-	0.78	1.2	V	I _S =10A, V _{GS} =0V
t _{rr}	-	69	-	ns	I _F =10A, di/dt=100A/μs
Q _{rr}	-	109	-	nC	

Note:

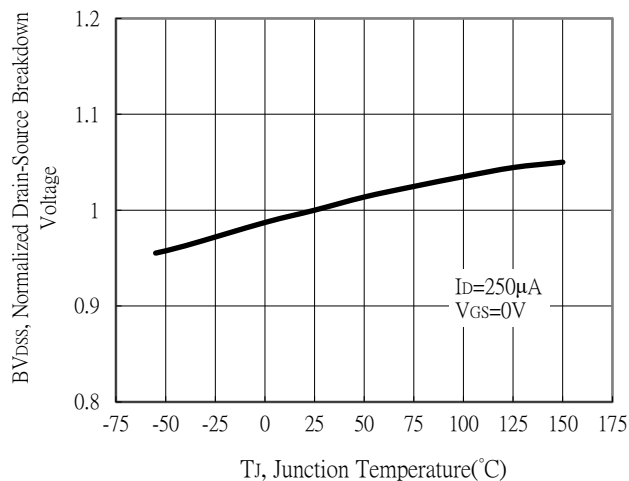
- *a. The power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.
- *b. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
- *c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}\text{C}$. Ratings are based on low frequency and low duty cycles to keep initial $T_J=25^{\circ}\text{C}$.
- *d. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- *e. Independent of operating temperature.

Typical Characteristics

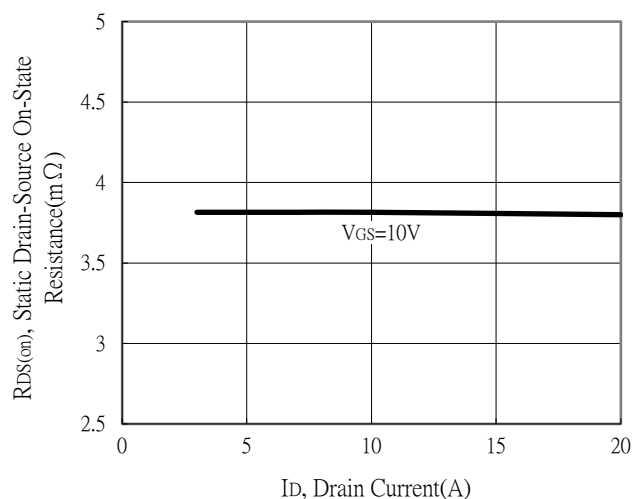
Typical Output Characteristics



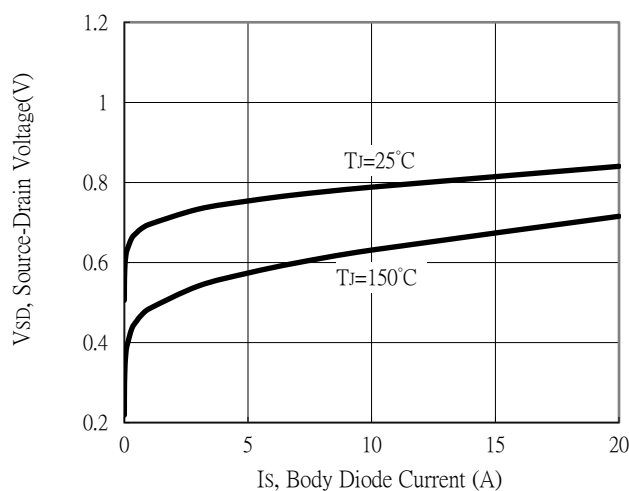
Breakdown Voltage vs Ambient Temperature



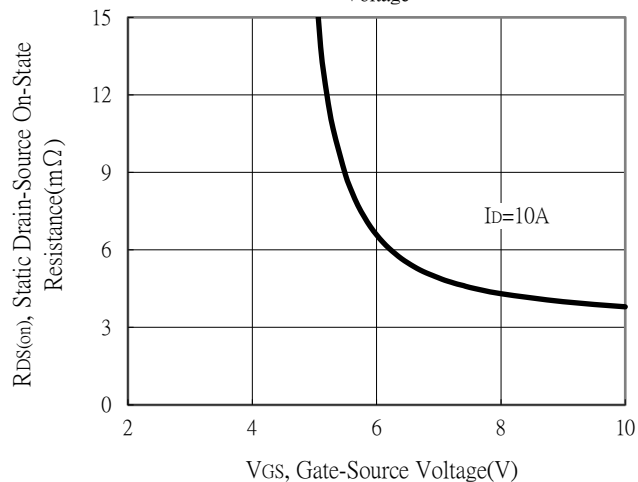
Static Drain-Source On-State resistance vs Drain Current



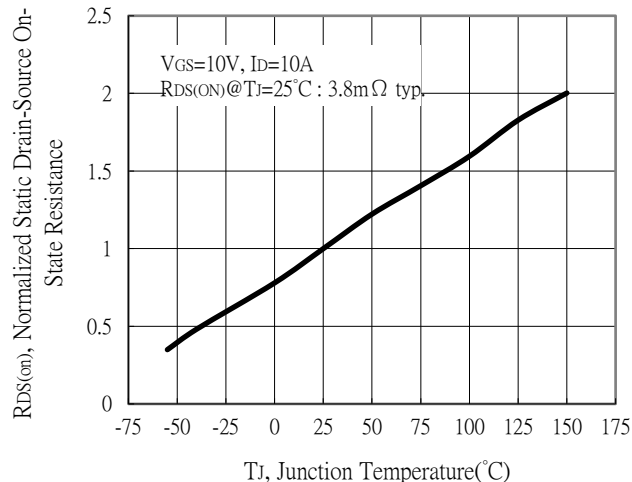
Body Diode Current vs Source-Drain Voltage



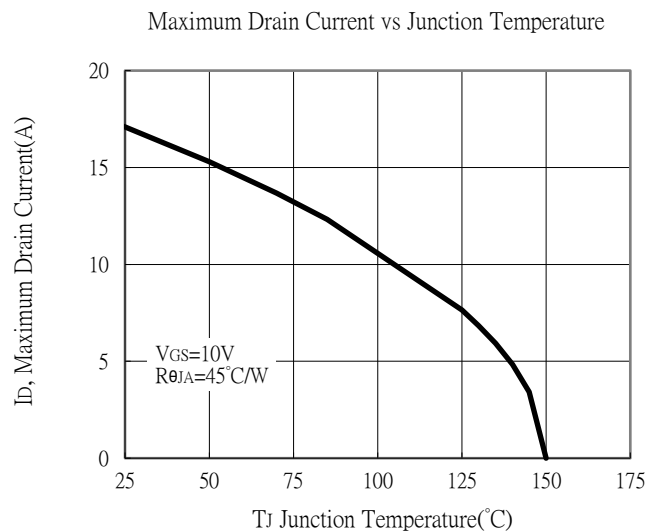
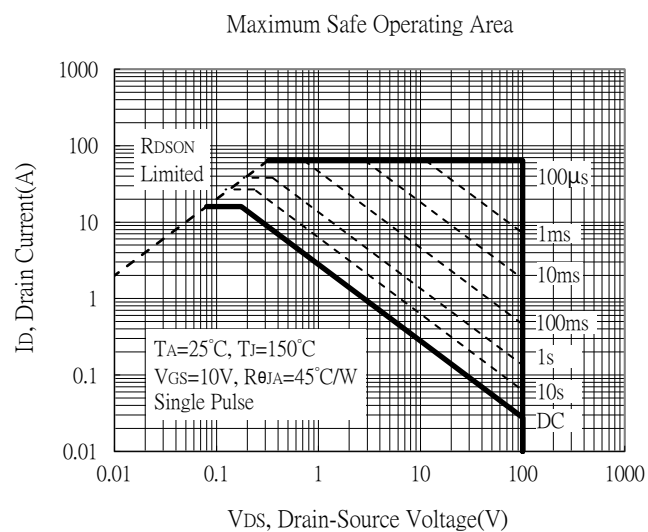
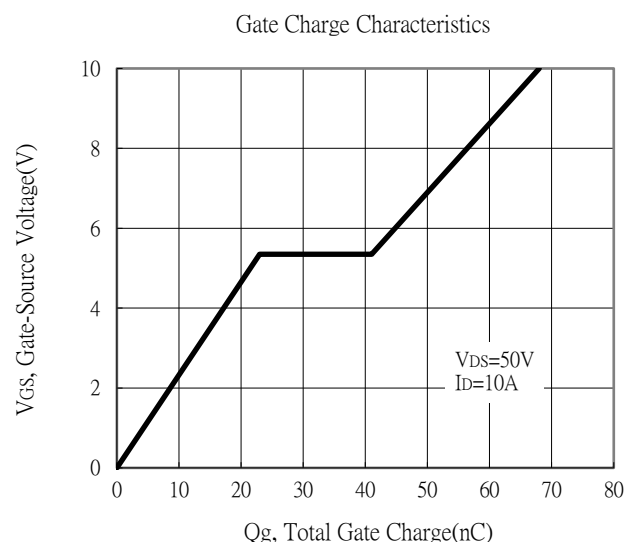
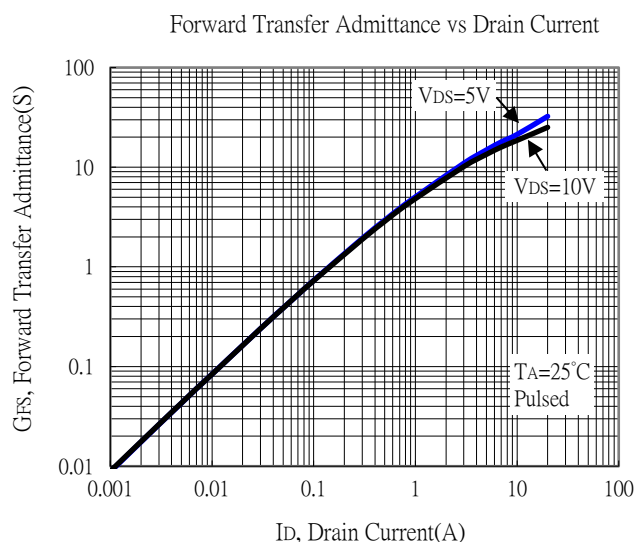
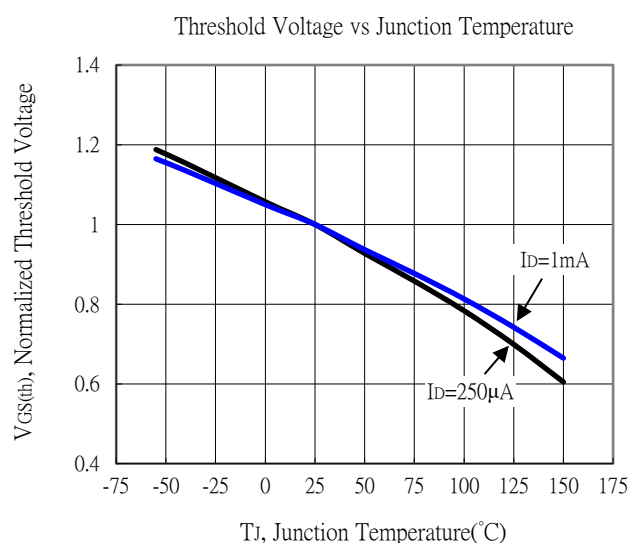
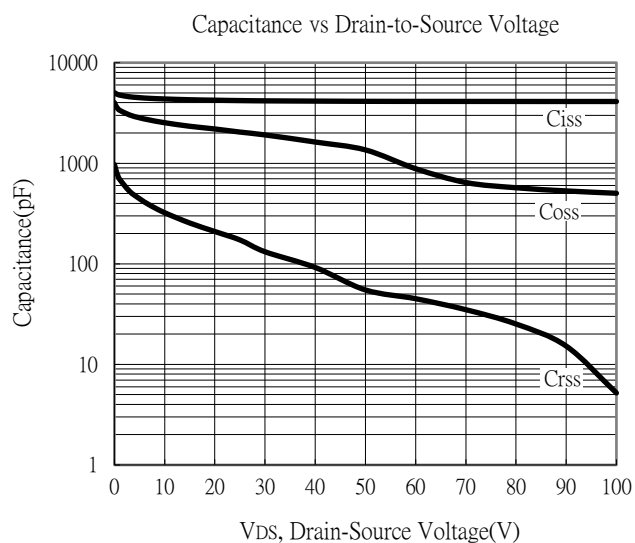
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature

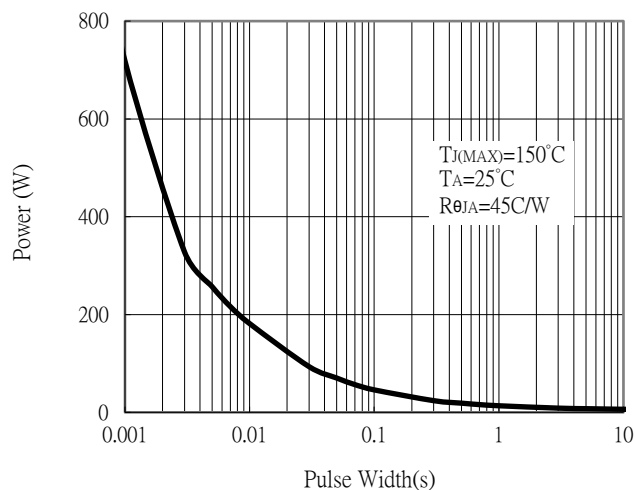


Typical Characteristics

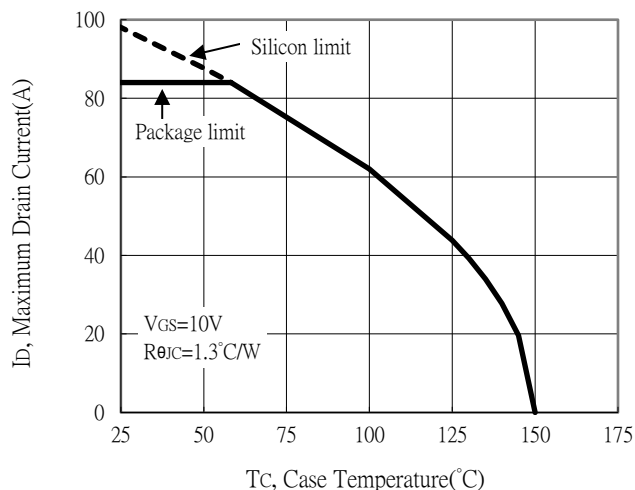


Typical Characteristics

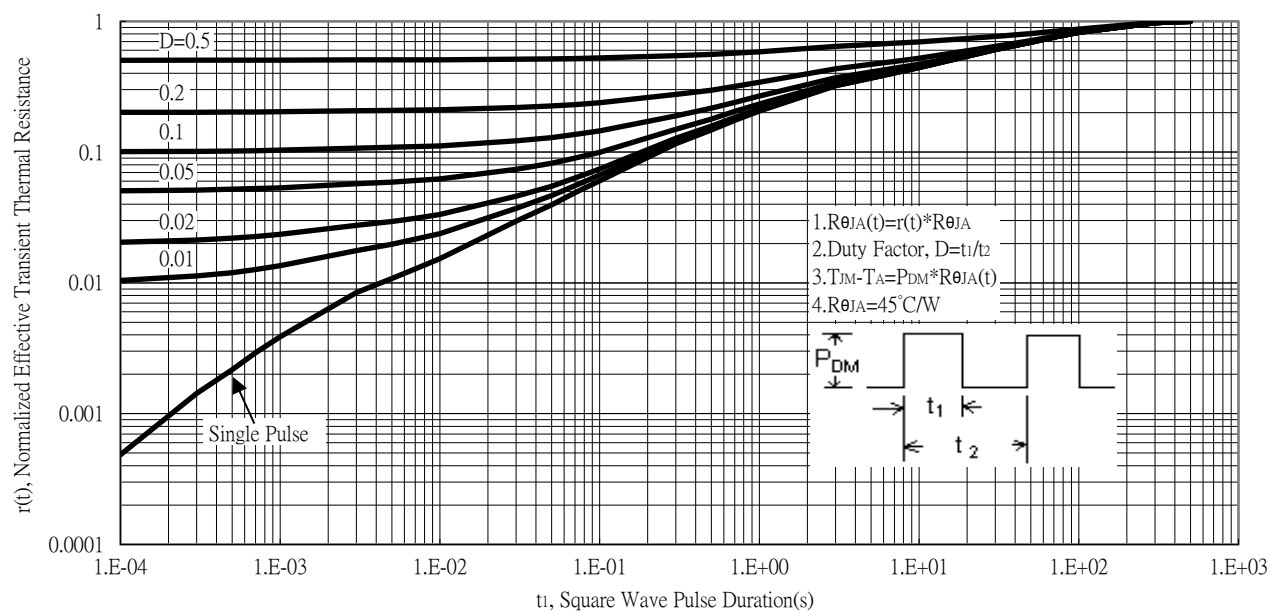
Single Pulse Power Rating, Junction to Ambient



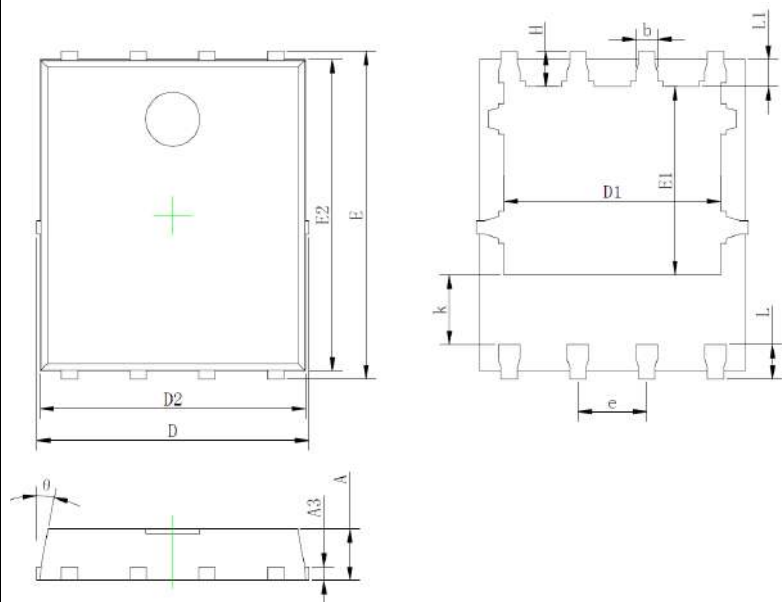
Maximum Drain Current vs Case Temperature



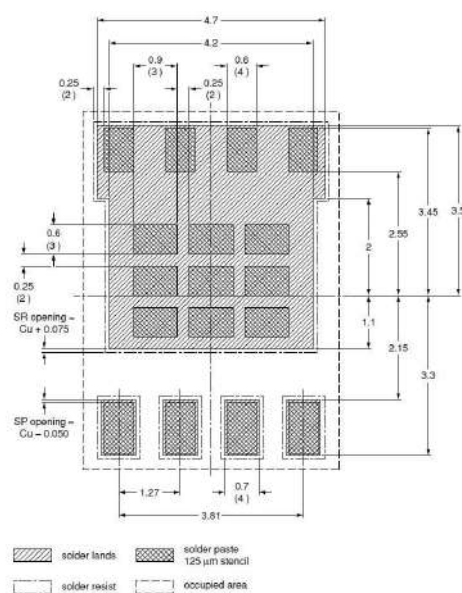
Transient Thermal Response Curves



DFN5×6 Dimension



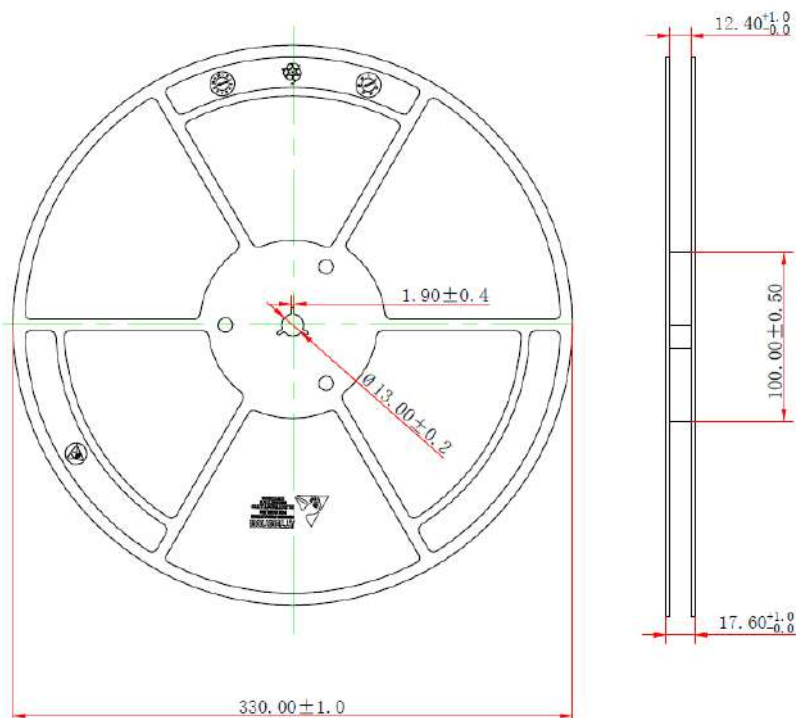
8-Lead DFN5×6 Plastic Package



Recommended Soldering Footprint

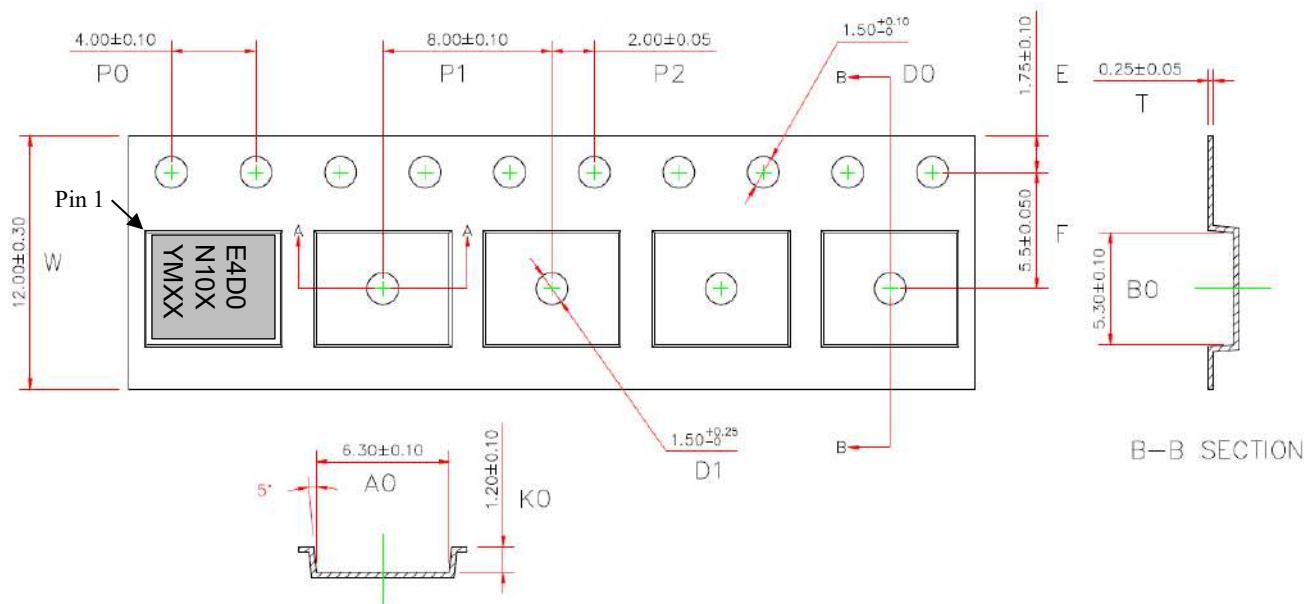
DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.039	0.900	1.000	k	0.047	0.055	1.190	1.390
A3	0.010	REF.	0.254	REF.	b	0.014	0.018	0.350	0.450
D	0.195	0.201	4.944	5.096	e	0.050	TYP.	1.270	TYP.
E	0.235	0.241	5.974	6.126	L	0.020	0.028	0.559	0.711
D1	0.154	0.162	3.910	4.110	L1	0.017	0.023	0.424	0.576
E1	0.133	0.141	3.375	3.575	H	0.023	0.029	0.574	0.726
D2	0.190	0.196	4.824	4.976	θ	10°	12°	10°	12°
E2	0.223	0.229	5.674	5.826					

Reel Dimension



Unit : mm

Carrier Tape Dimension

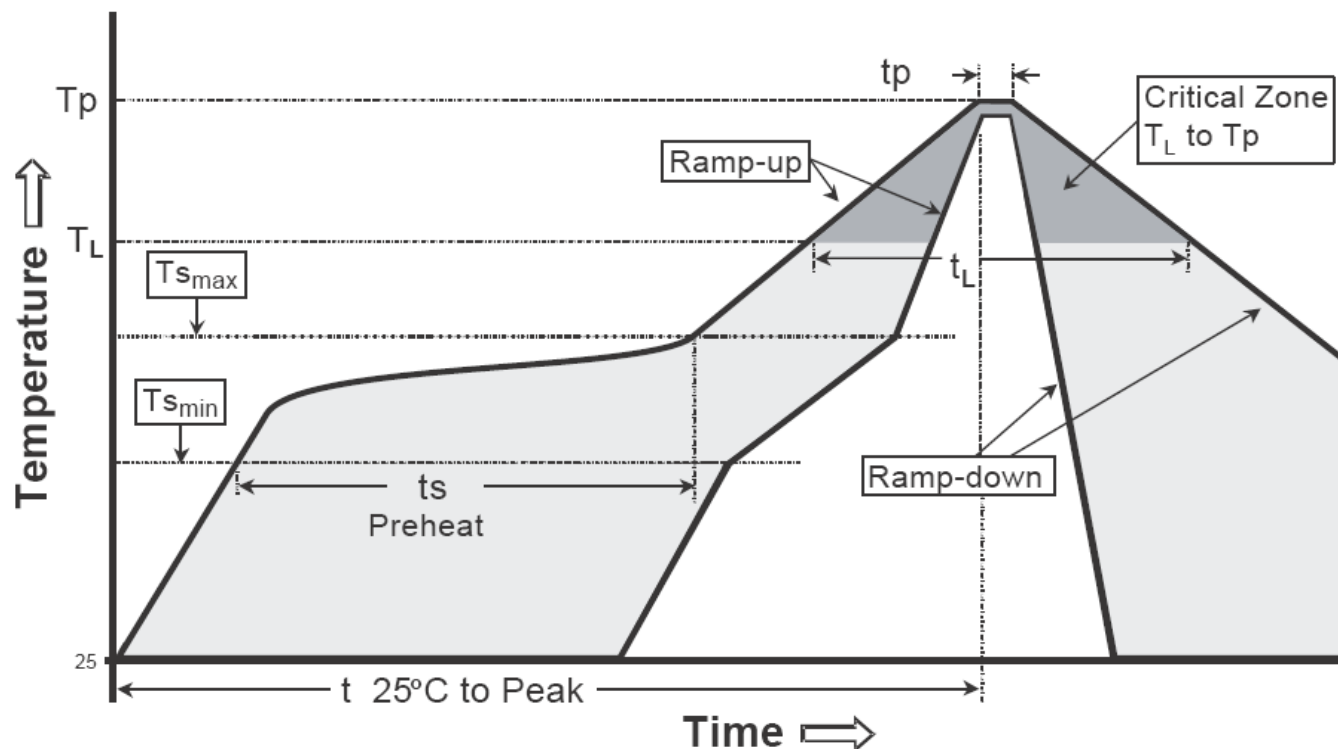


Unit : mm

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 (Ts max 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 (TL) -Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (TP)	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.