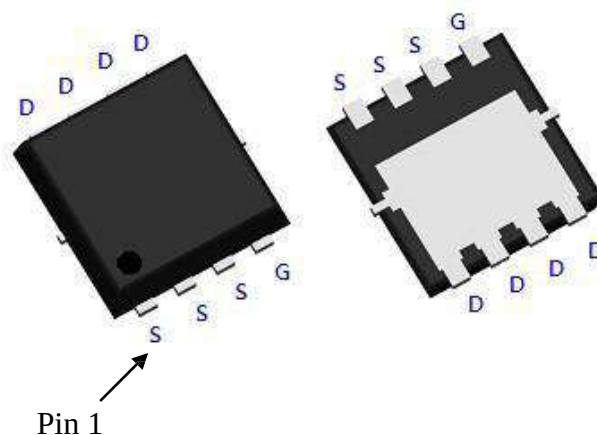


P-Channel Enhancement Mode Power MOSFET

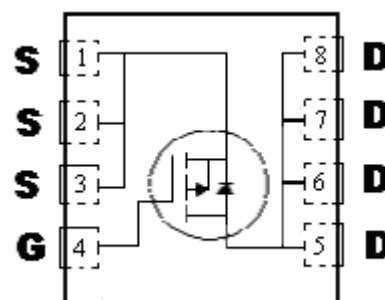
Features :

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

DFN3×3



BV _{DSS}	-20V
I _D @ T _C =25°C, V _{GS} =-4.5V	-49A
I _D @ T _A =25°C, V _{GS} =-4.5V	-12A
R _{DS(on)} @V _{GS} =-4.5V, I _D =-20A	7.7mΩ (typ.)
R _{DS(on)} @V _{GS} =-2.5V, I _D =-20A	9.5mΩ (typ.)
R _{DS(on)} @V _{GS} =-1.8V, I _D =-20A	12.5 mΩ (typ.)



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KSPRA7D0P02	DFN3×3 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V _{DS}	-20	V
Gate-Source Voltage		V _{GS}	±10	
Continuous Drain Current @ T _C =25°C, V _{GS} =-4.5V		I _D	-49	A
Continuous Drain Current @ T _C =100°C, V _{GS} =-4.5V			-31	
Continuous Drain Current @ T _A =25°C, V _{GS} =-4.5V			-12	
Continuous Drain Current @ T _A =70°C, V _{GS} =-4.5V			-9.6	
Pulsed Drain Current		I _{DM}	-196 *1	mJ
Avalanche Current @ L=0.1mH		I _{AS}	-46	
Avalanche Energy @ L=1mH, I _D =-18A, V _{DD} =-15V		E _{AS}	162 *4	
Repetitive Avalanche Energy @ L=0.05mH		E _{AR}	4.1 *2	W
Total Power Dissipation	T _C =25°C	P _D	41.7	
	T _C =100°C		16.7	
	T _A =25°C		2.5 *3	
	T _A =70°C		1.6 *3	
Operating Junction and Storage Temperature Range		T _j , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	3	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{θJA}	50 *3	

- 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, t ≤ 10s ; 125°C/W when mounted on minimum copper pad.
4. 100% tested by conditions of L=0.1mH, I_{AS}=-10A, V_{GS}=-10V, V_{DD}=-15V

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-20	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-0.4	-	-1.0		V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±8V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-16V, V _{GS} =0V
	-	-	-10		V _{DS} =-16V, V _{GS} =0V, T _j =125°C
R _{DS(ON)} *1	-	7.7	10	mΩ	V _{GS} =-4.5V, I _D =-20A
	-	9.5	13.5		V _{GS} =-2.5V, I _D =-20A
	-	12.5	17.5		V _{GS} =-1.8V, I _D =-20A
G _{FS} *1	-	28.6	-	S	V _{DS} =-5V, I _D =-3A

Electrical Characteristics(Cont.) (T_j=25°C, unless otherwise specified)

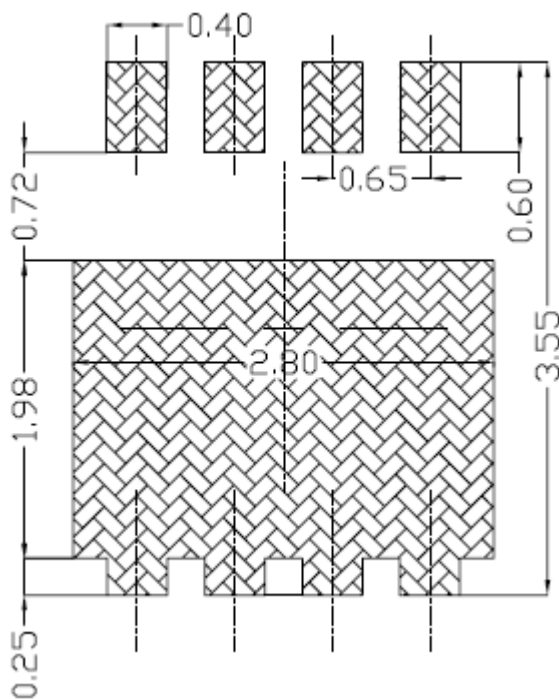
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Dynamic					
C _{iss}	-	5367	-	pF	V _{DS} =-10V, V _{GS} =0V, f=1MHz
C _{oss}	-	419	-		
C _{rss}	-	284	-		
Q _g *1, 2	-	63	90	nC	V _{DS} =-10V, I _D =-20A, V _{GS} =-4.5V
Q _{gs} *1, 2	-	10	-		
Q _{gd} *1, 2	-	7.5	-		
R _g	-	5.3	-	Ω	f=1MHz
Source-Drain Diode					
I _S *1	-	-	-49	A	
I _{SM} *3	-	-	-196		
V _{SD} *1	-	-0.7	-1	V	I _F =-1A, V _{GS} =0V
t _{rr}	-	15.9	-	ns	I _F =-20A, dI _F /dt=100A/μs
Q _{rr}	-	9.4	-	nC	

Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

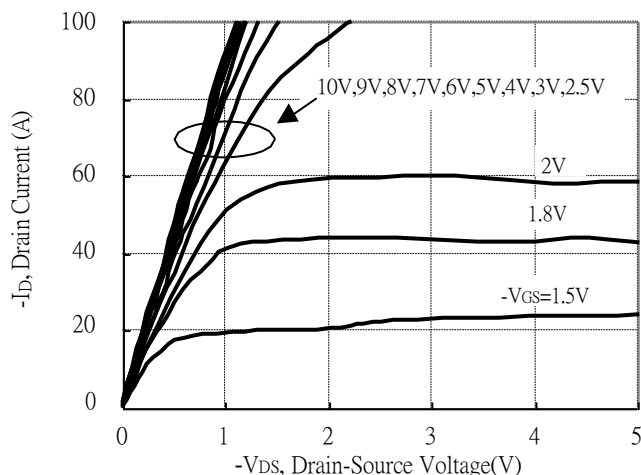
Recommended Soldering Footprint



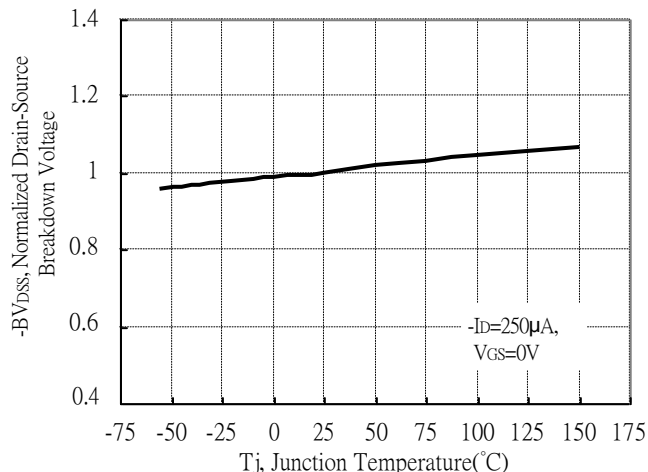
unit : mm

Typical Characteristics

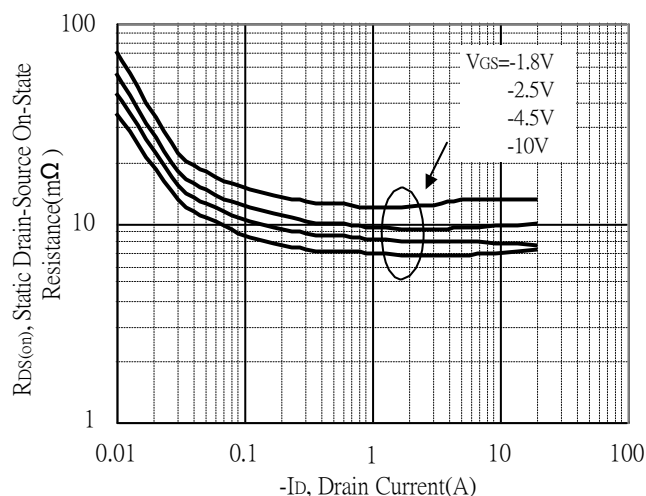
Typical Output Characteristics



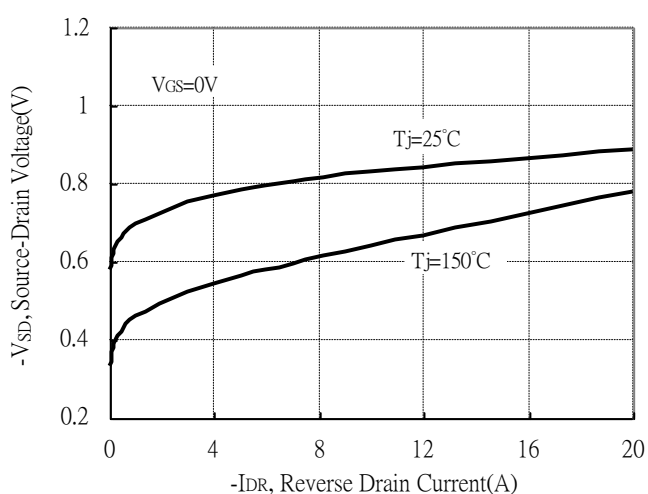
Breakdown Voltage vs Junction Temperature



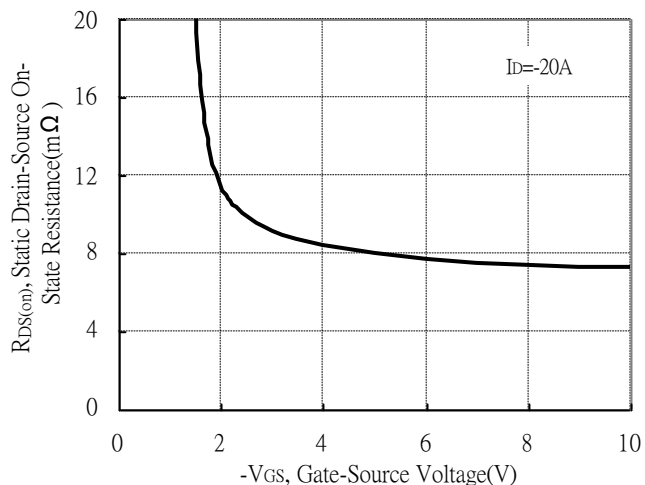
Static Drain-Source On-State resistance vs Drain Current



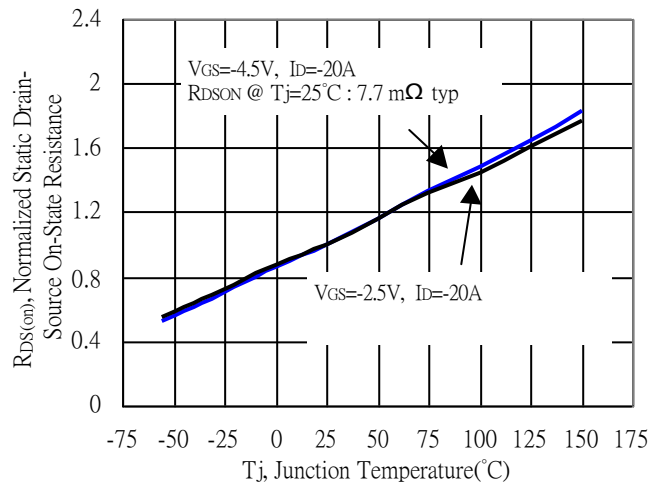
Reverse Drain Current vs Source-Drain Voltage



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

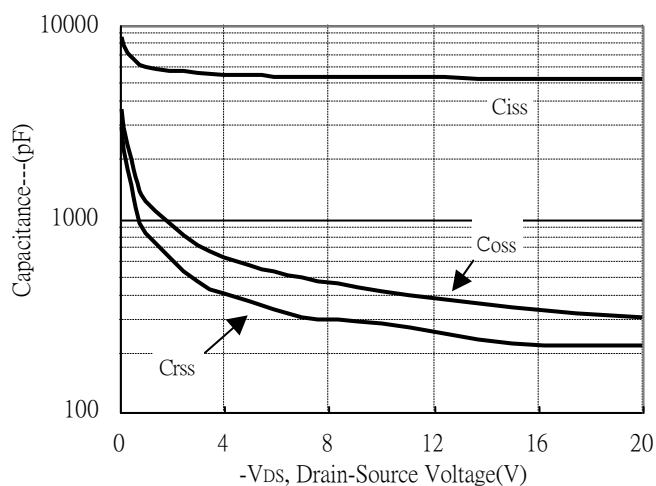


Drain-Source On-State Resistance vs Junction Temperature

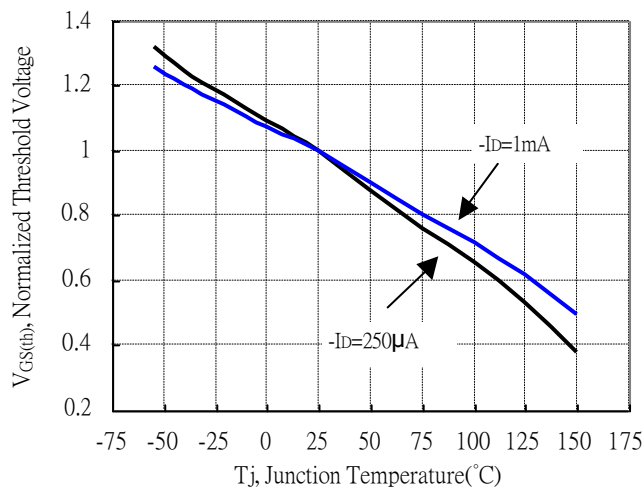


Typical Characteristics(Cont.)

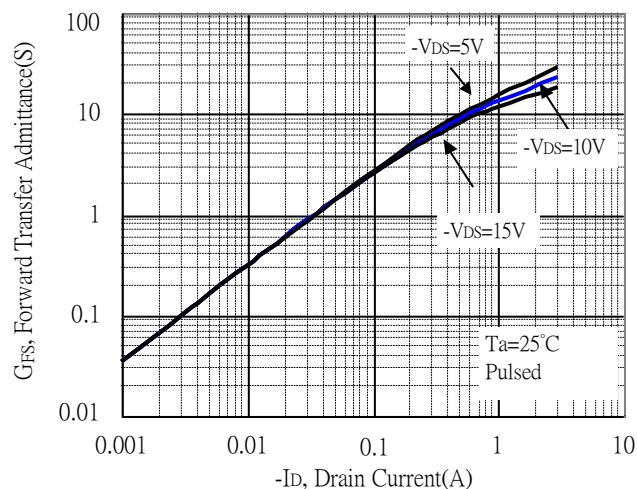
Capacitance vs Drain-to-Source Voltage



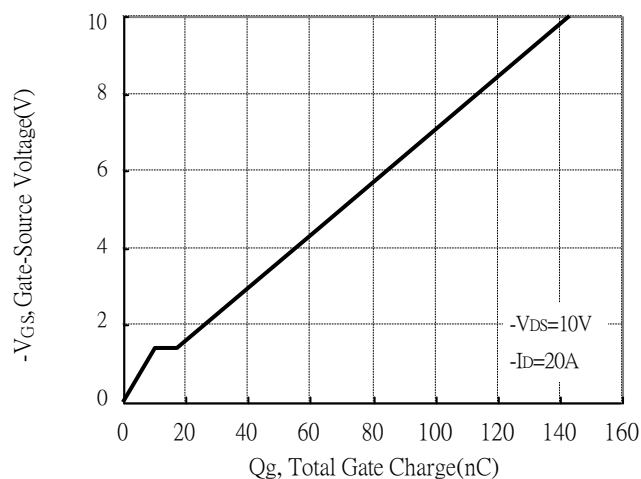
Threshold Voltage vs Junction Temperature



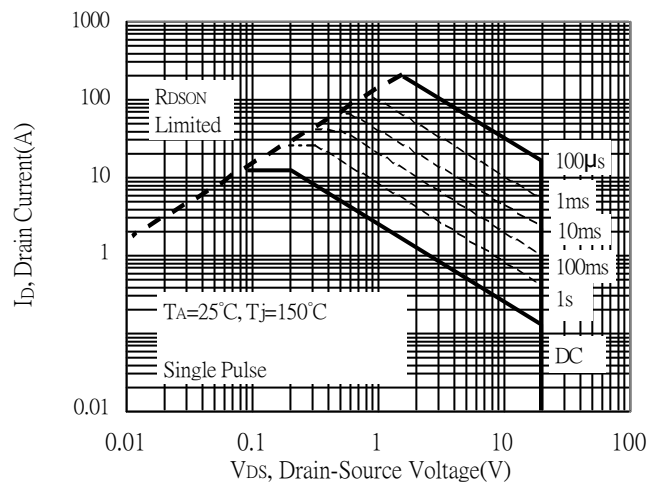
Forward Transfer Admittance vs Drain Current



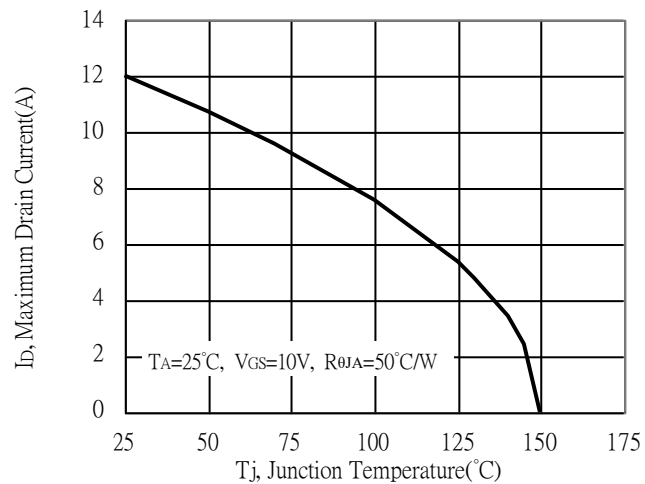
Gate Charge Characteristics



Maximum Safe Operating Area

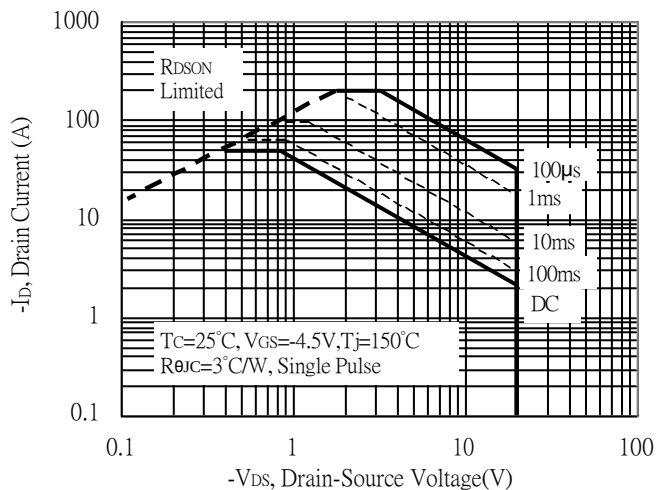


Maximum Drain Current vs Junction Temperature

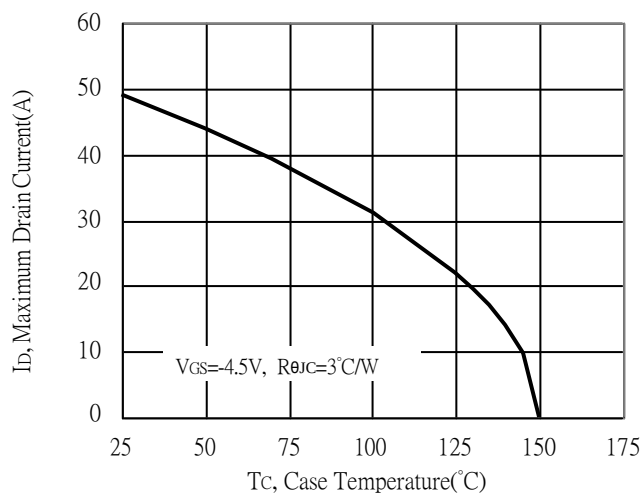


Typical Characteristics(Cont.)

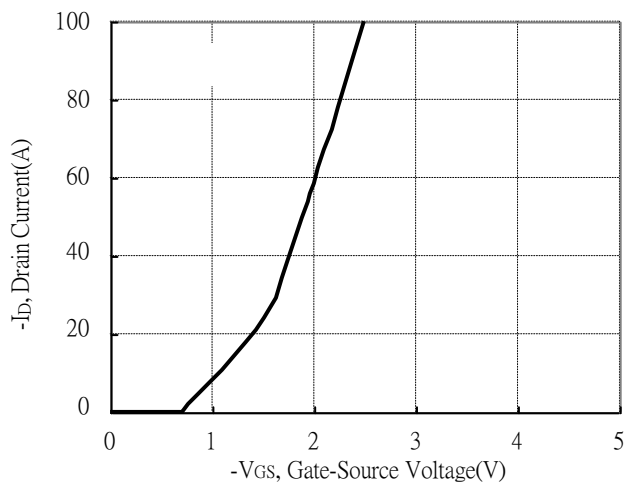
Maximum Safe Operating Area



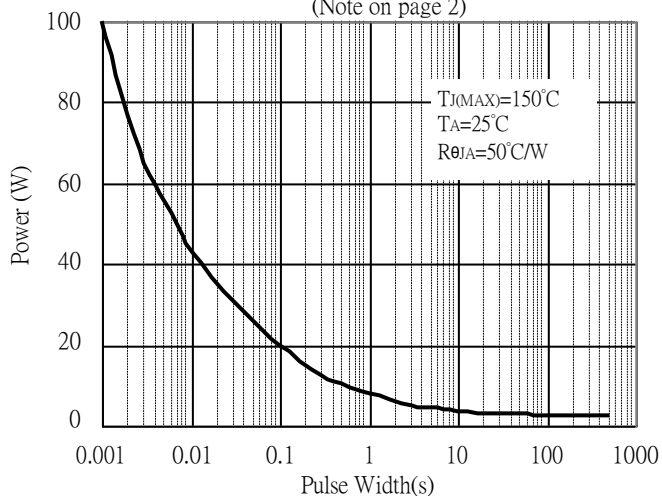
Maximum Drain Current vs Case Temperature



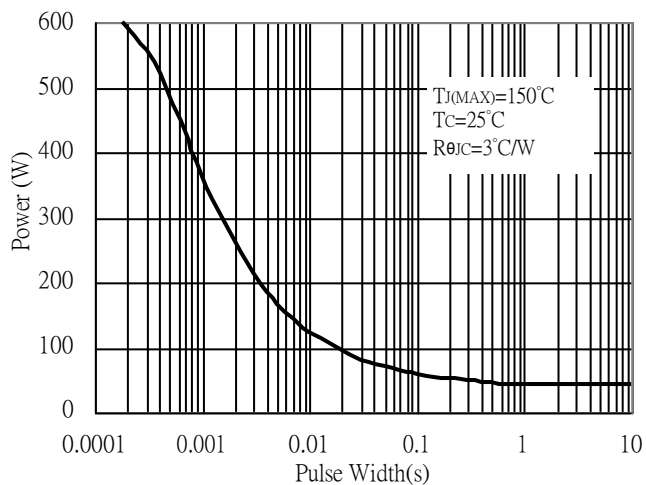
Typical Transfer Characteristics



Single Pulse Power Rating, Junction to Ambient
(Note on page 2)

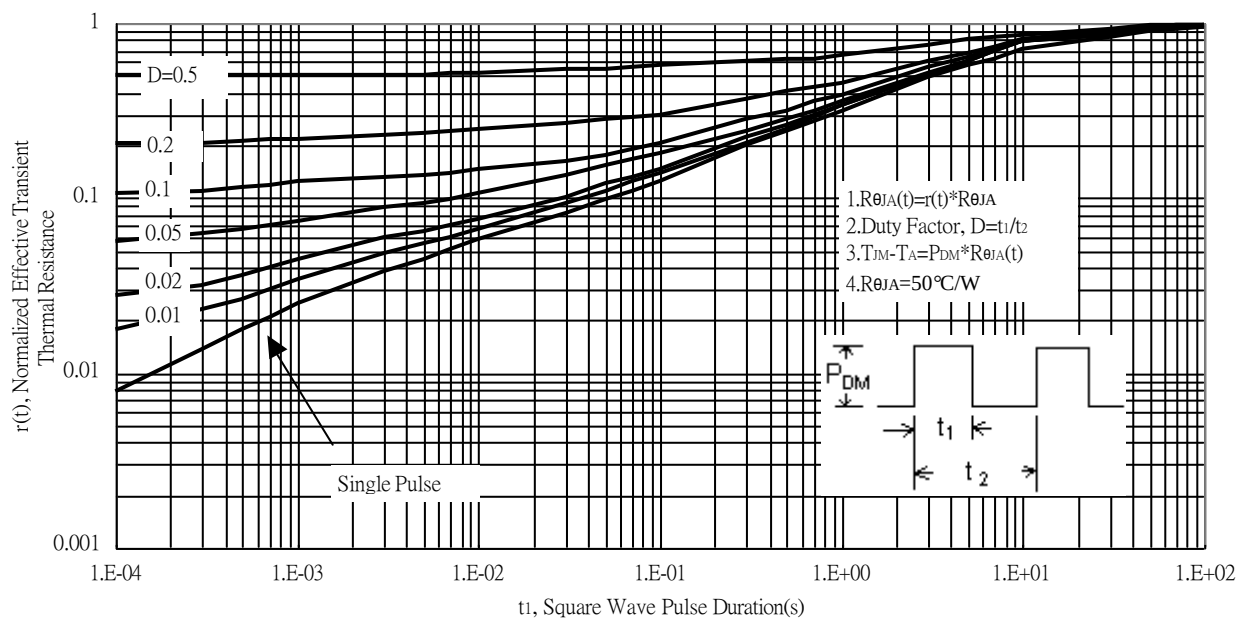


Single Pulse Maximum Power Dissipation

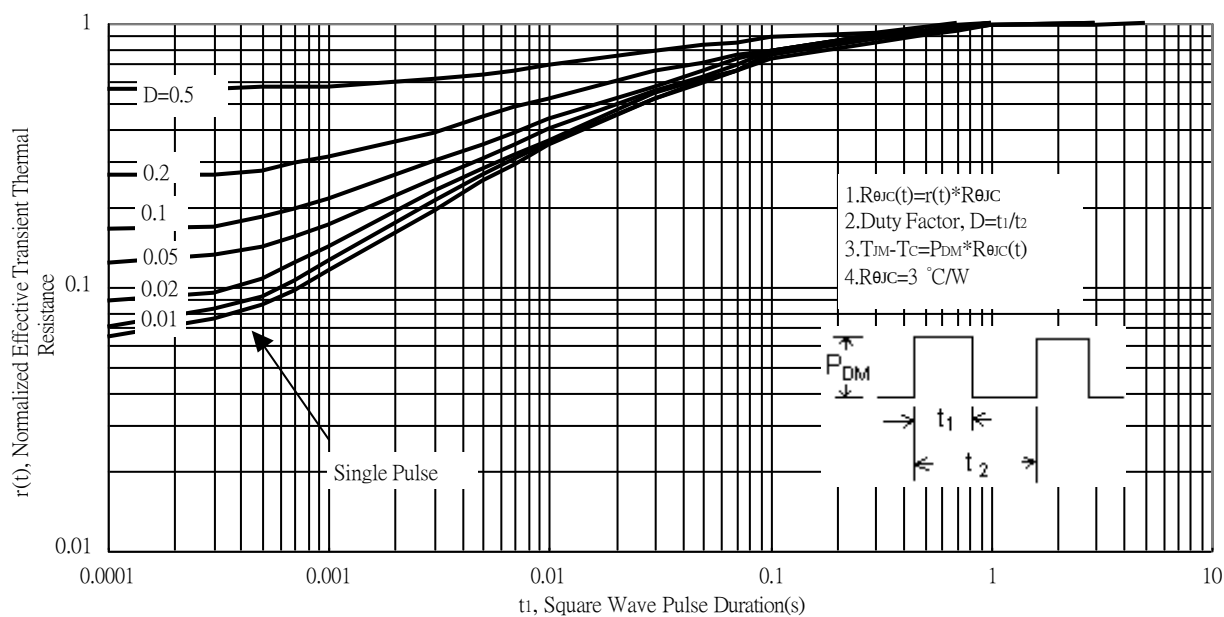


Typical Characteristics(Cont.)

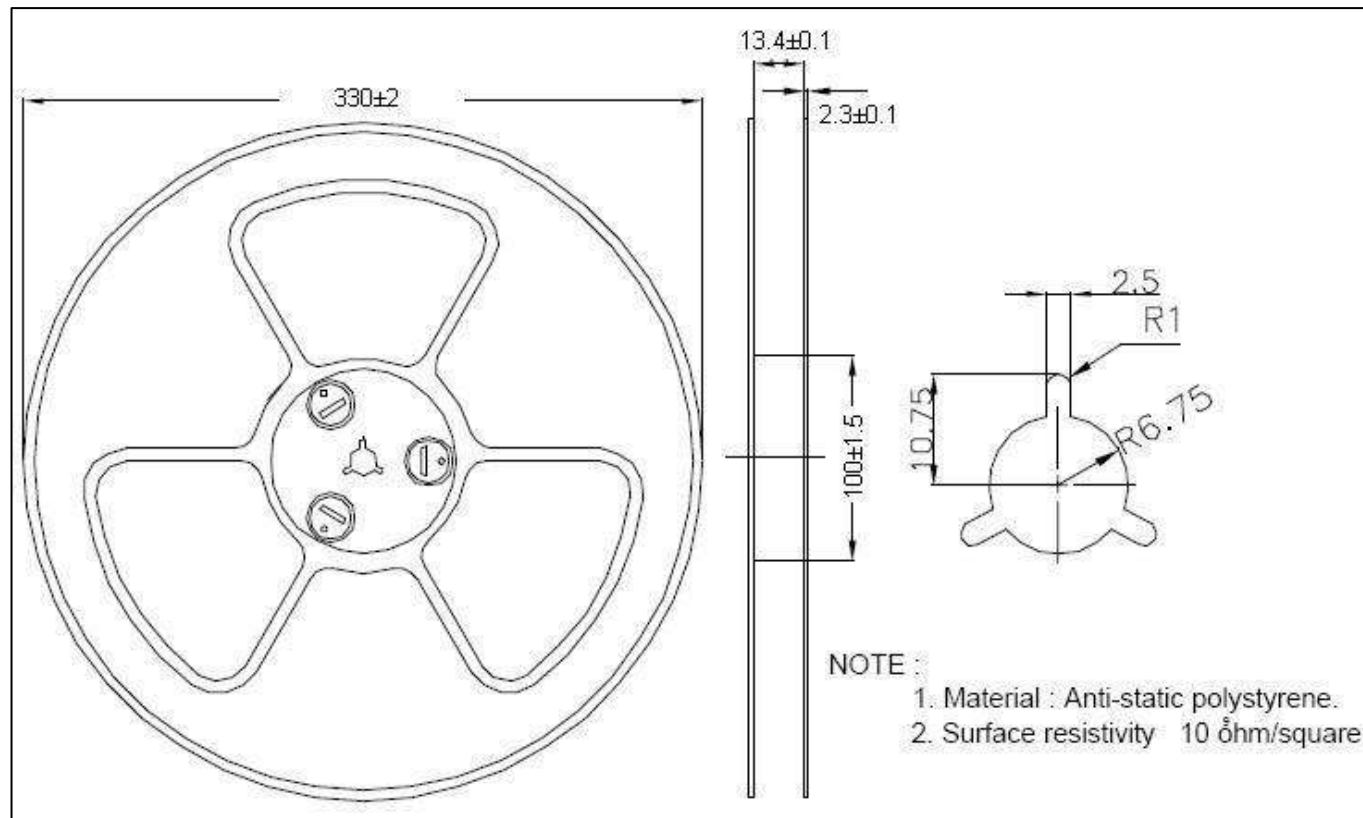
Transient Thermal Response Curves



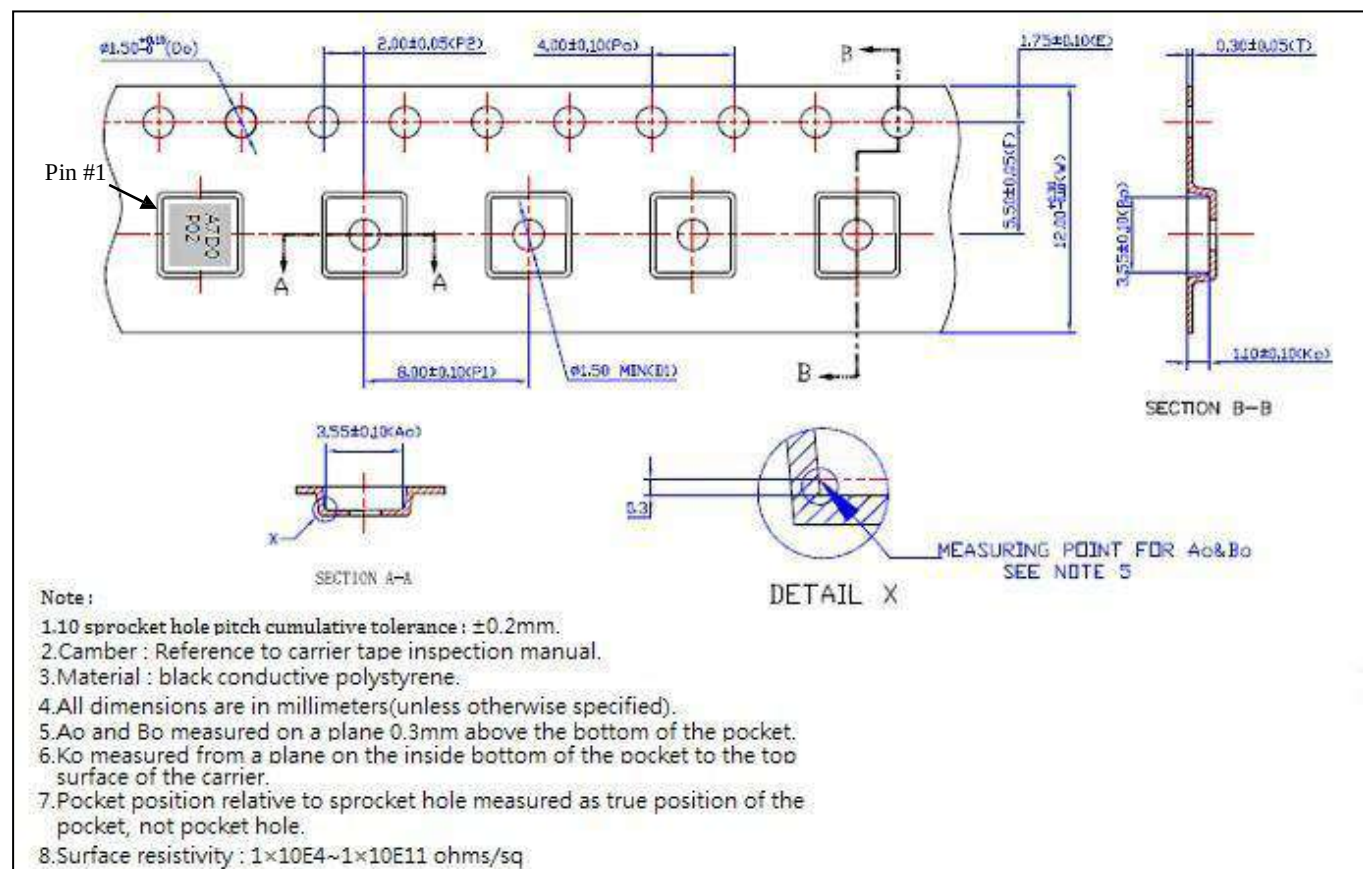
Transient Thermal Response Curves



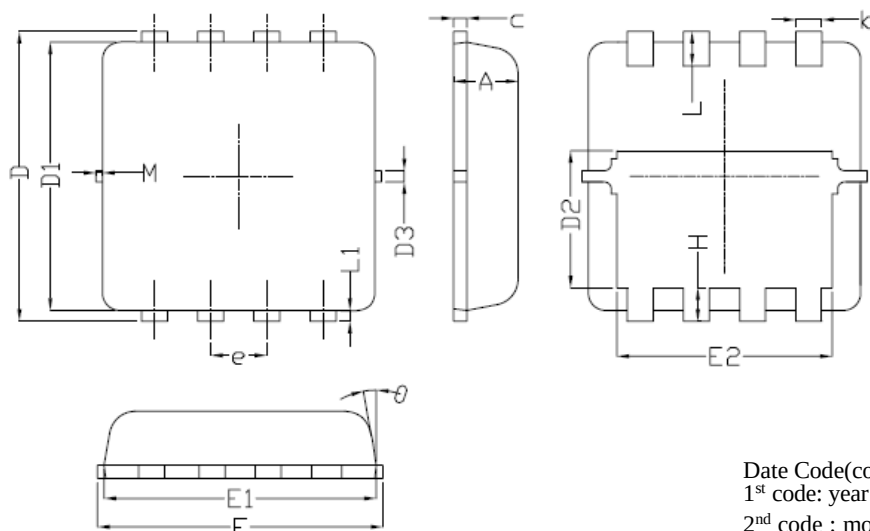
Reel Dimension



Carrier Tape Dimension

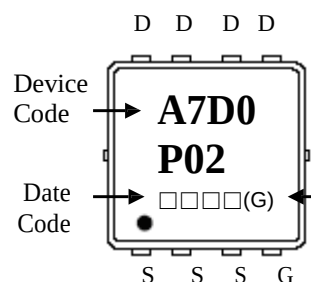


DFN3×3 Dimension



8-Lead DFN3×3 Plastic Package

Marking:



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	0.031	E1	3.00	3.20	0.118	0.126
b	0.25	0.35	0.010	0.014	E2	2.39	2.59	0.094	0.102
c	0.10	0.25	0.004	0.010	e	0.65 BSC		0.026 BSC	
D	3.25	3.45	0.128	0.136	H	0.30	0.50	0.012	0.020
D1	3.00	3.20	0.118	0.126	L	0.30	0.50	0.012	0.020
D2	1.48	1.68	0.058	0.066	L1	0.13 TYP		0.005 TYP	
D3	0.13 TYP		0.005 TYP		θ	8°	12°	8°	12°
E	3.20	3.40	0.126	0.134	M	-	0.15	-	0.006