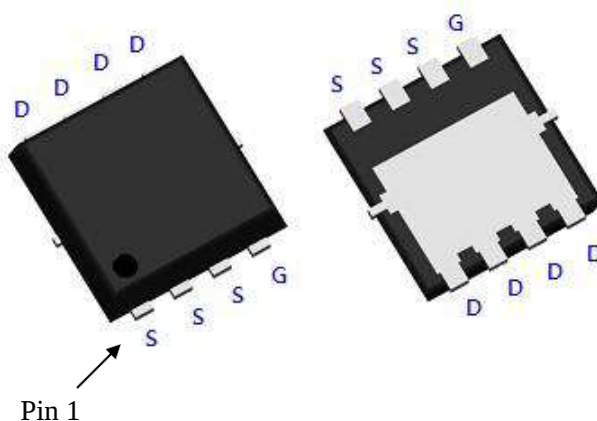


P-Channel Enhancement Mode Power MOSFET

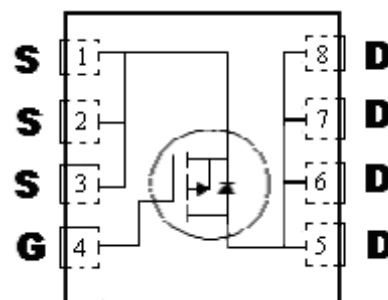
Features:

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

DFN3x3



BV_{DSS}	-14V
$I_D @ T_C=25^{\circ}C, V_{GS}=-4.5V$	-20.8A
$I_D @ T_A=25^{\circ}C, V_{GS}=-4.5V$	-6.5A
$R_{DS(on)} @ V_{GS}=-4.5V, I_D=-10A$	22m Ω (typ.)
$R_{DS(on)} @ V_{GS}=-2.5V, I_D=-7A$	28m Ω (typ.)
$R_{DS(on)} @ V_{GS}=-1.8V, I_D=-5A$	38 m Ω (typ.)



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KSPRA028P01	DFN3x3 (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}	-14	V
Gate-Source Voltage	V _{GS}	±8	
Continuous Drain Current @ T _C =25°C, V _{GS} =-4.5V	I _D	-20.8	A
Continuous Drain Current @ T _C =100°C, V _{GS} =-4.5V		-13.2	
Continuous Drain Current @ T _A =25°C, V _{GS} =-4.5V		-6.5	
Continuous Drain Current @ T _A =70°C, V _{GS} =-4.5V		-5.2	
Pulsed Drain Current	I _{DM}	-83 *1	
Avalanche Current @ L=0.1mH	I _{AS}	-24	
Avalanche Energy @ L=1mH, I _D =-12A, V _{DD} =-15V	E _{AS}	72 *4	mJ
Repetitive Avalanche Energy @ L=0.05mH	E _{AR}	2.5 *2	
Total Power Dissipation	P _D	T _C =25°C 25	W
		T _C =100°C 10	
		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}	5	°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}	-14	-	-	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} =-10V, V _{GS} =0V
	-	-	-10		V _{DS} =-10V, V _{GS} =0V, T _j =55°C
R _{DS(ON)} *1	-	22	32	mΩ	V _{GS} =-4.5V, I _D =-10A
	-	28	44		V _{GS} =-2.5V, I _D =-7A
	-	38	86		V _{GS} =-1.8V, I _D =-5A
G _{FS} *1	-	31	-	S	V _{DS} =-5V, I _D =-3A

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

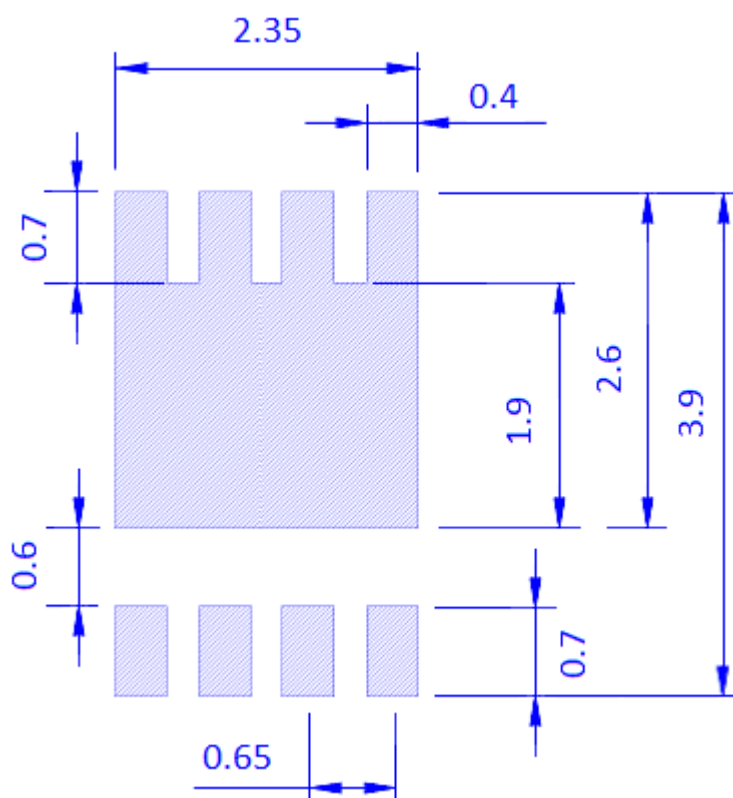
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Dynamic					
Ciss	-	1276	-	pF	V _{DS} =-10V, V _{GS} =0V, f=1MHz
Coss	-	251	-		
Crss	-	233	-		
Qg *1, 2	-	16	32	nC	V _{DS} =-10V, I _D =-10A, V _{GS} =-4.5V
Qgs *1, 2	-	2.1	-		
Qgd *1, 2	-	5.2	-		
t _{d(ON)} *1, 2	-	15	-	ns	V _{DS} =-10V, I _D =-10A, V _{GS} =-4.5V, R _G =6Ω
t _r *1, 2	-	26.2	-		
t _{d(OFF)} *1, 2	-	63.2	-		
t _f *1, 2	-	44.2	-		
R _g	-	10	-	Ω	f=1MHz
Source-Drain Diode					
I _S *1	-	-	-20.8	A	
I _{SM} *3	-	-	-83		
V _{SD} *1	-	-0.8	-1.2	V	I _F =-5A, V _{GS} =0V
t _{rr}	-	25.8	-	ns	I _F =-5A, dI _F /dt=100A/μs
Q _{rr}	-	6.4	-	nC	

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

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

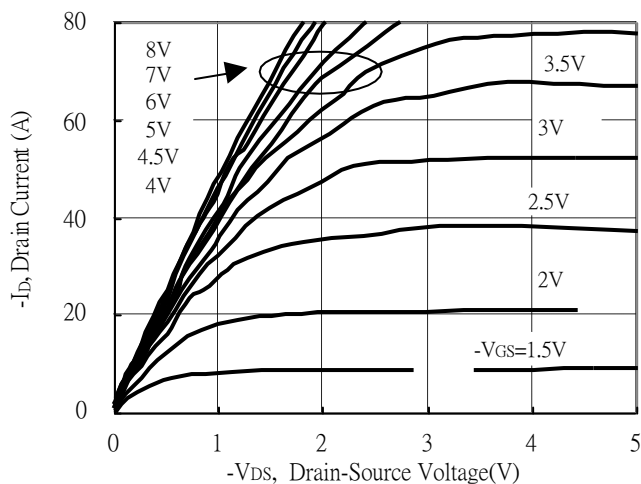
Recommended Soldering Footprint



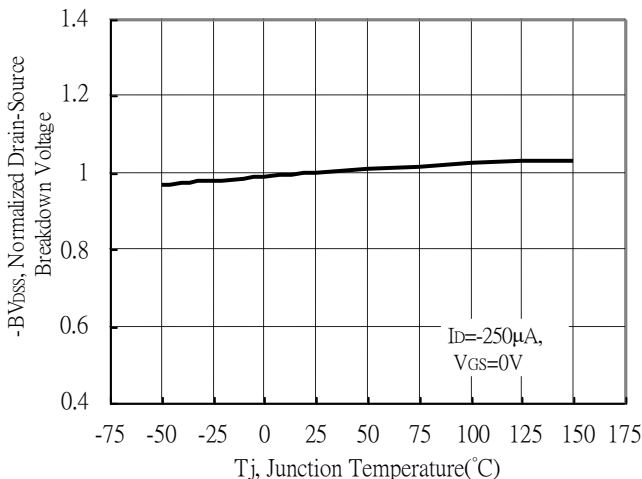
unit : mm

Typical Characteristics

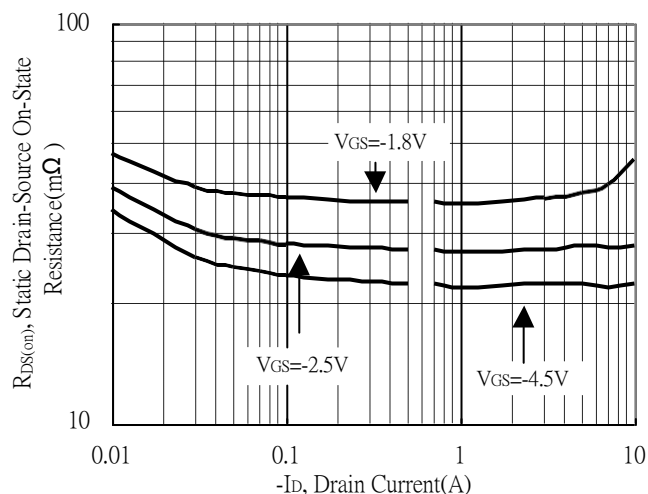
Typical Output Characteristics



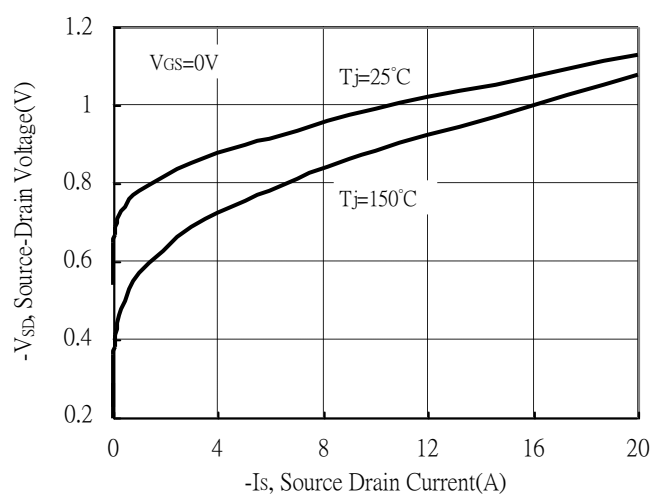
Breakdown Voltage vs Ambient Temperature



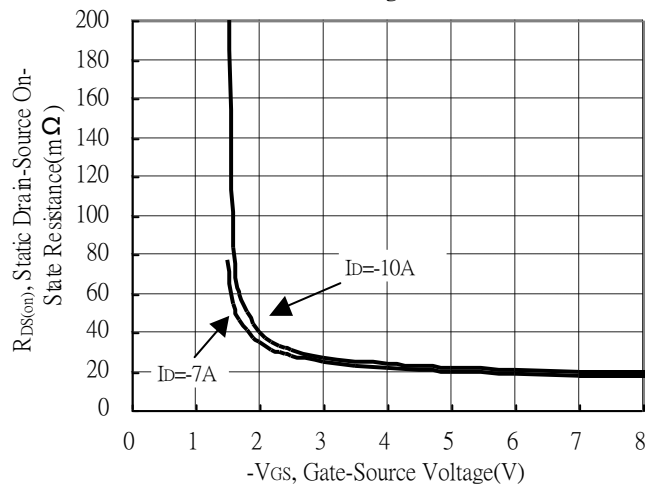
Static Drain-Source On-State resistance vs Drain Current



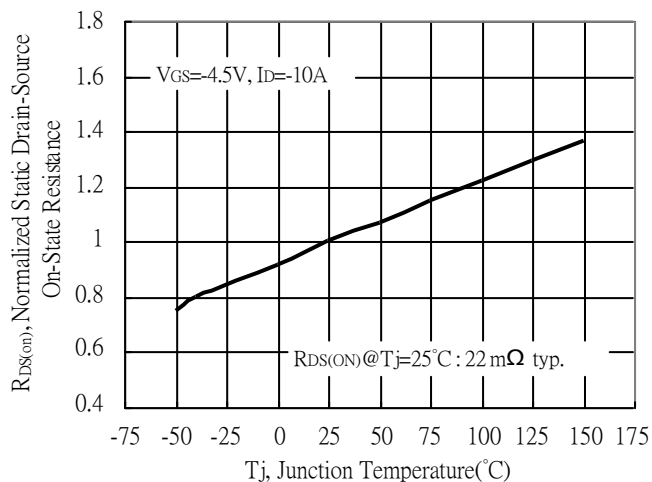
Source Drain Current vs Source-Drain Voltage



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

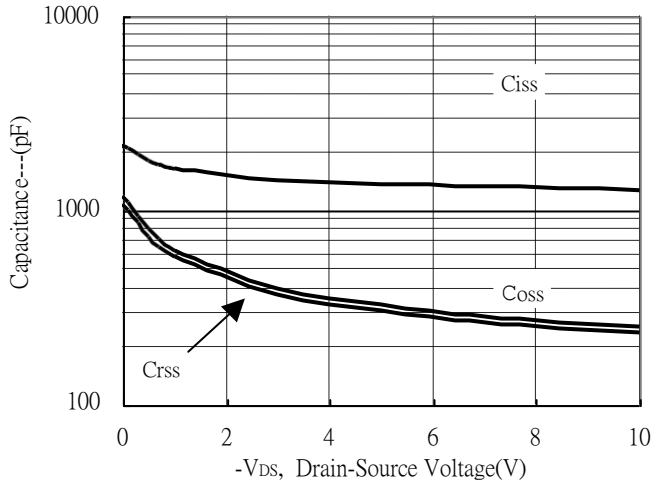


Drain-Source On-State Resistance vs Junction Temperature

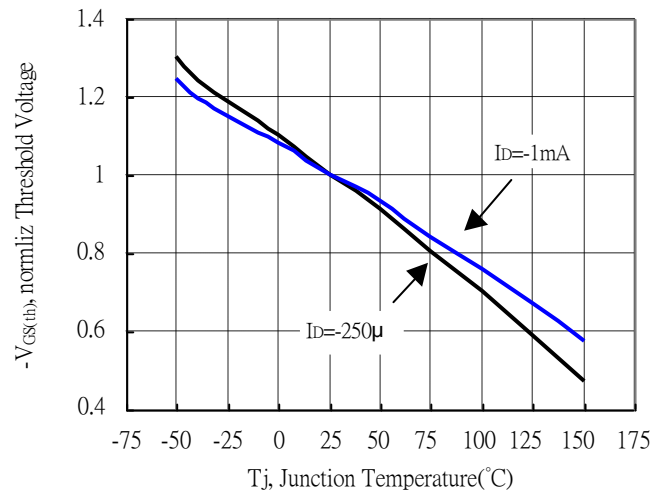


Typical Characteristics(Cont.)

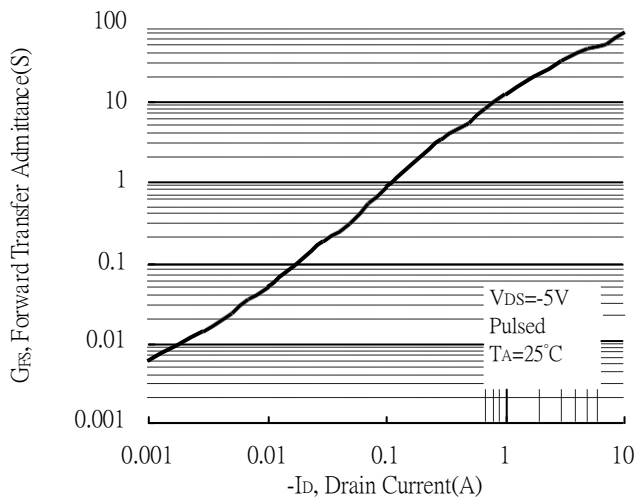
Capacitance vs Drain-to-Source Voltage



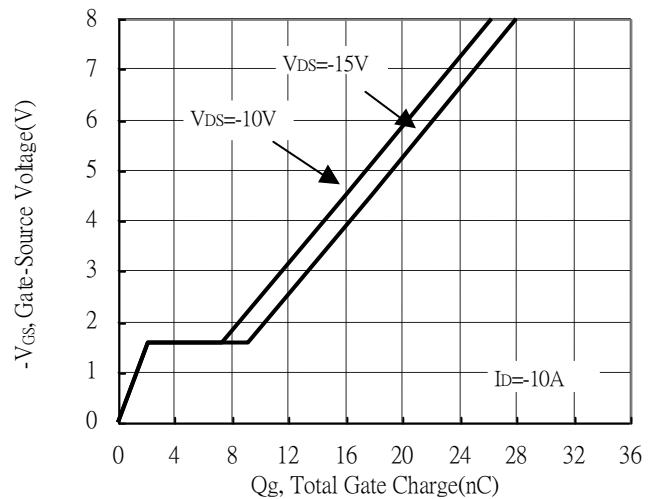
Threshold Voltage vs Junction Temperature



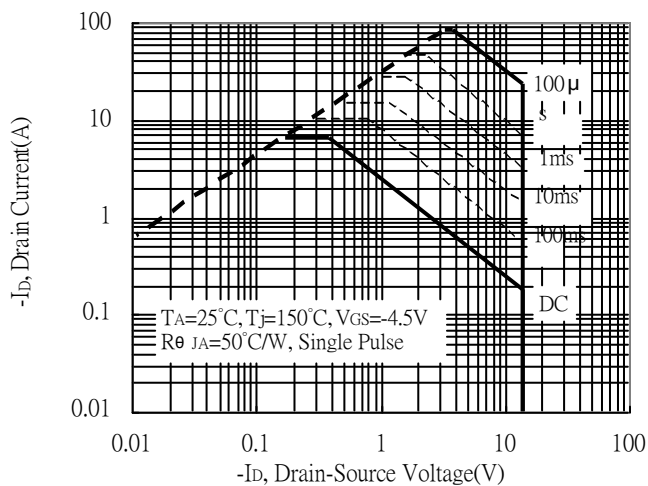
Forward Transfer Admittance vs Drain Current



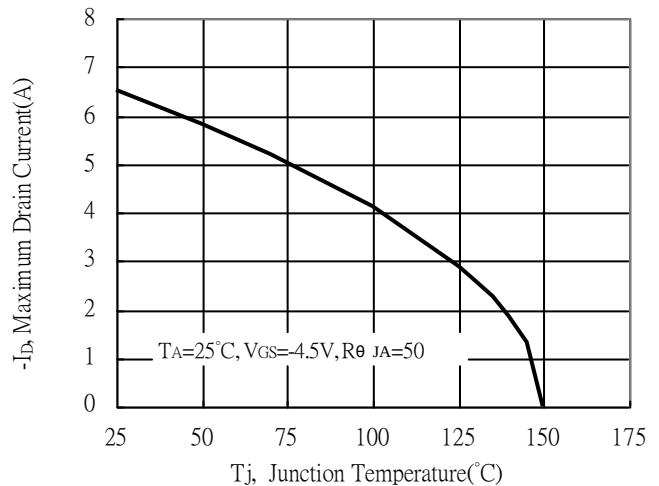
Gate Charge Characteristics



Maximum Safe Operating Area

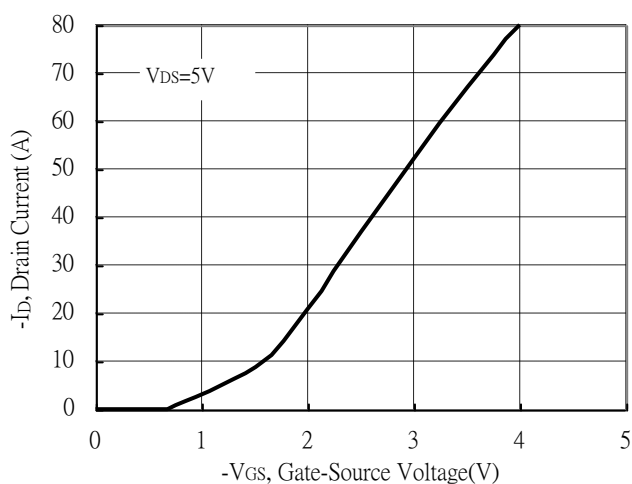


Maximum Drain Current vs Junction Temperature

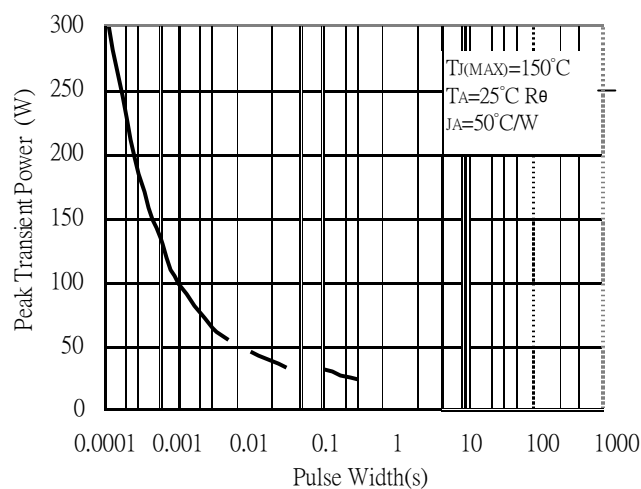


Typical Characteristics(Cont.)

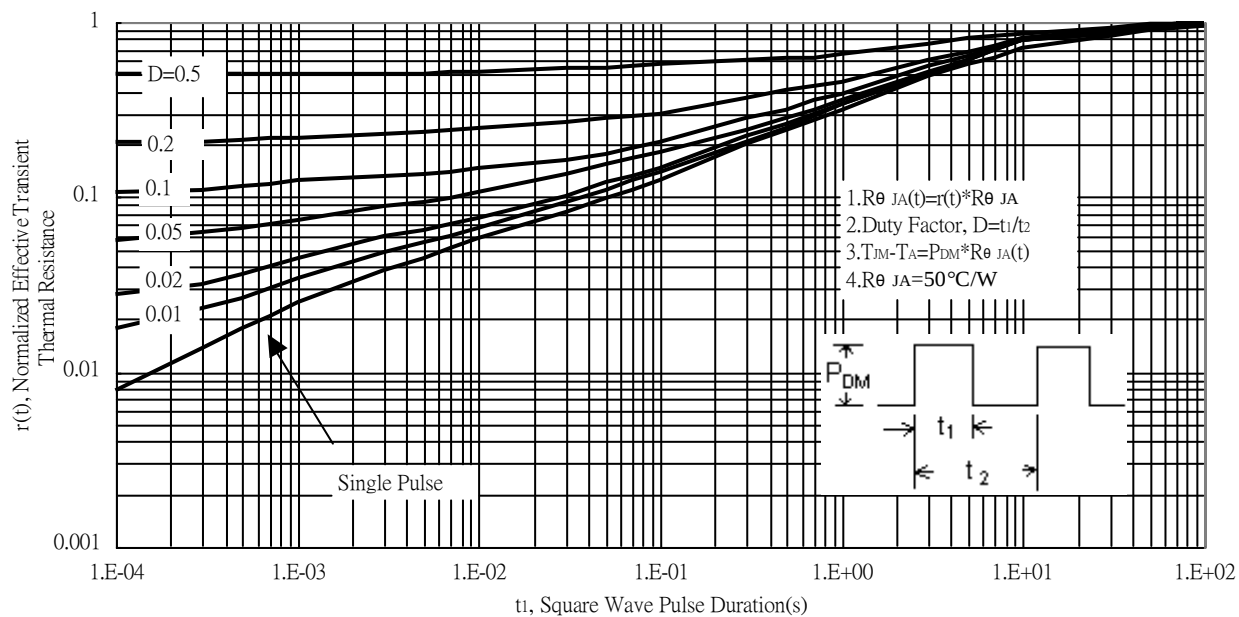
Typical Transfer Characteristics



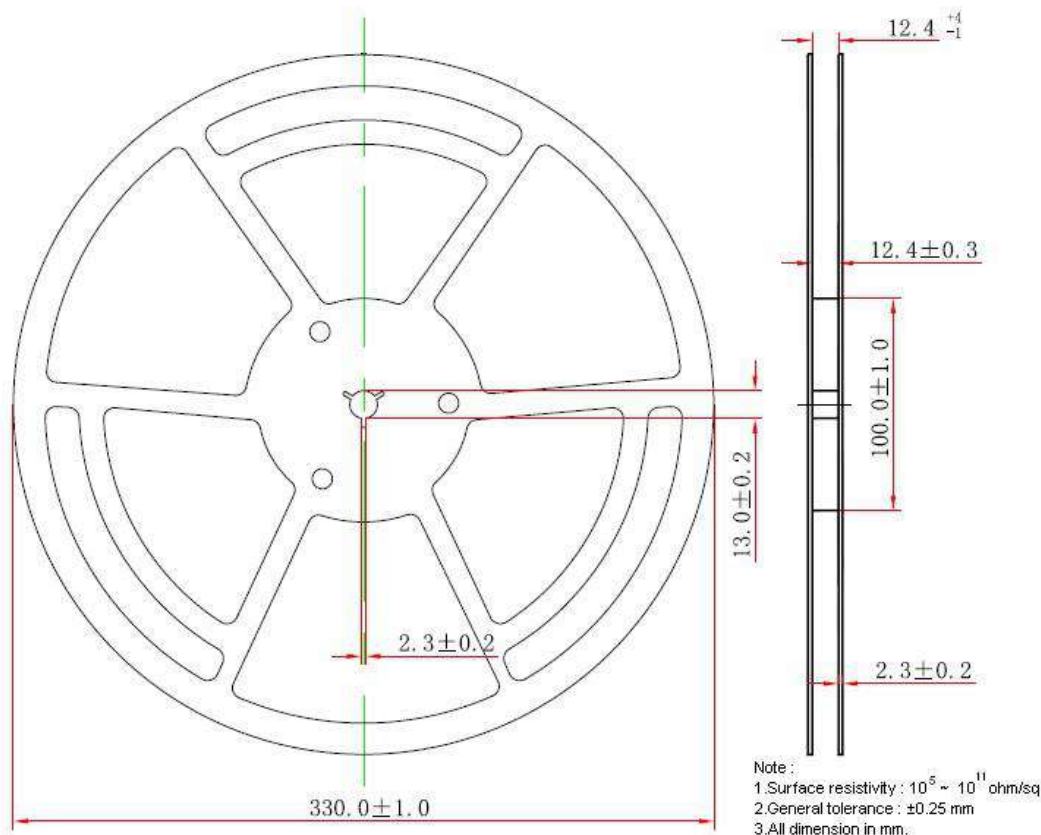
Single Pulse Maximum Power Dissipation



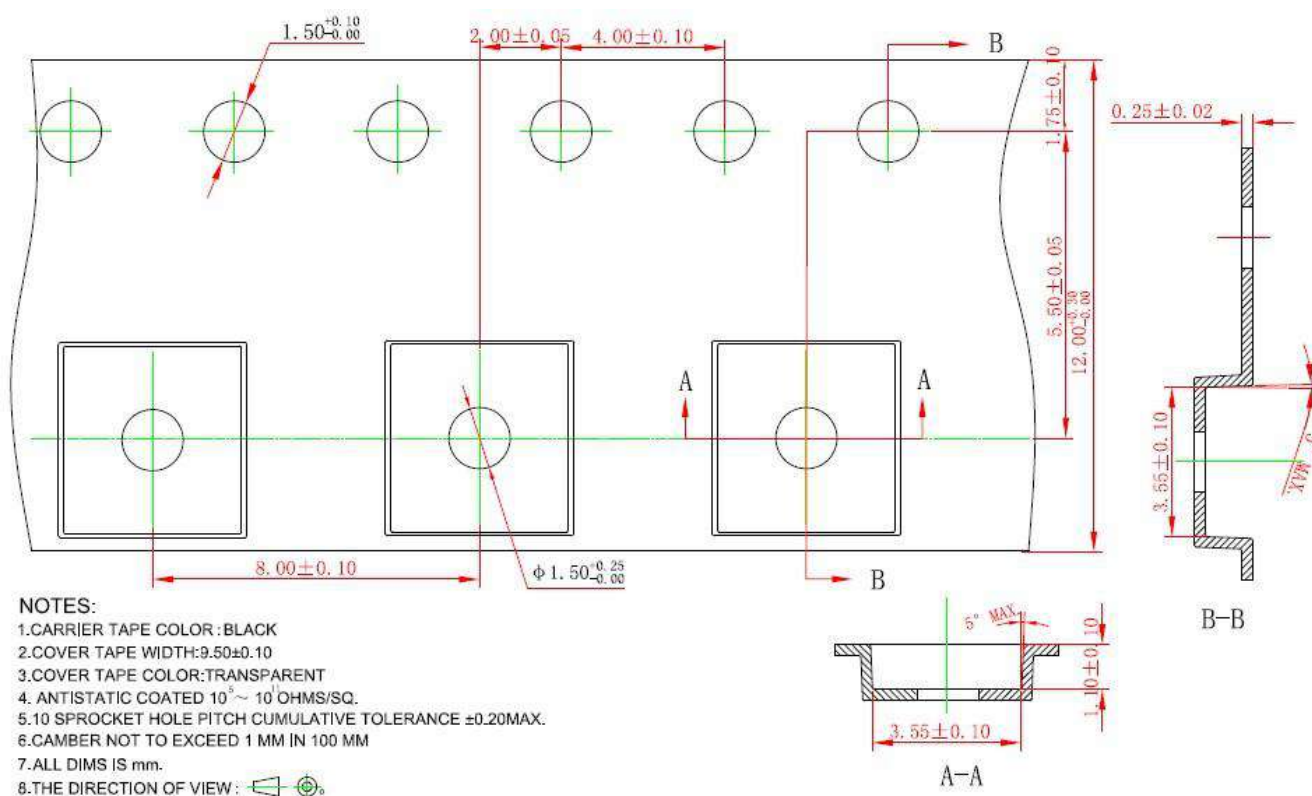
Transient Thermal Response Curves



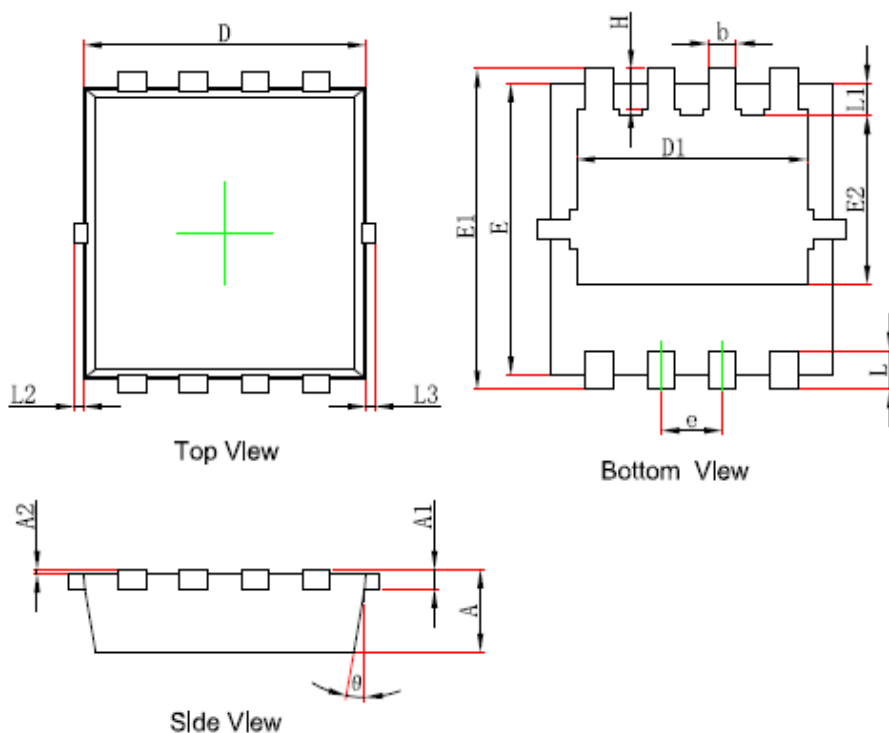
Reel Dimension



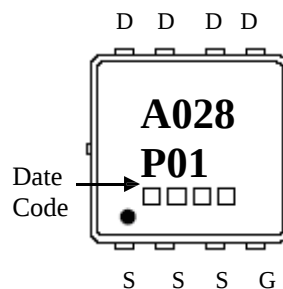
Carrier Tape Dimension



DFN3×3 Dimension



Marking:



8-Lead DFN3×3 Plastic Package
 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°