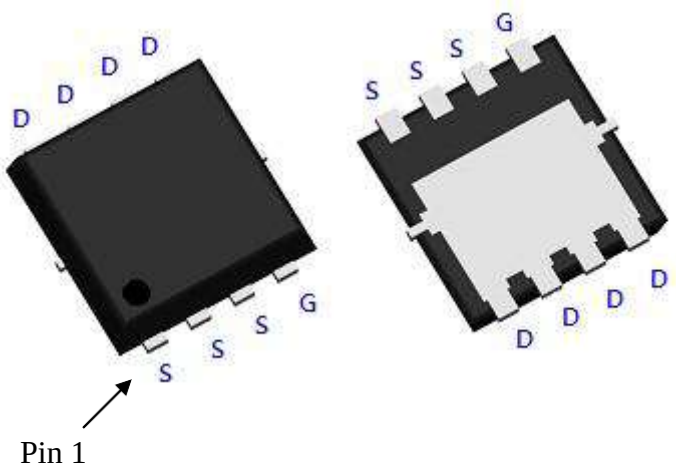
N-Channel Enhancement Mode Power MOSFET

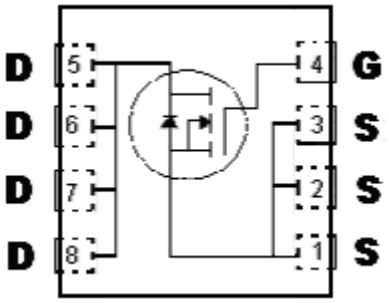
Features:

- Simple Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free package

DFN3×3



BV_{DSS}		100V
I_D @ V_{GS}=10V, T_A=25°C		7A
I_D @ V_{GS}=10V, T_C=25°C		24.9A
$R_{DSON(TYP)}$	V_{GS}=10V, I_D=7A	25mΩ
	V_{GS}=6V, I_D=5A	55mΩ



G：Gate　D：Drain　S：Source

Ordering Information

Device	Package	Shipping
KSPRE020N10BR	DFN3×3 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel

Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C		I_D	24.9	A
Continuous Drain Current @ V_{GS}=10V, T_C=70°C			19.9	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C			7	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C			5.6	
Pulsed Drain Current		I_{DM}	97 *1	
Avalanche Current @ L=0.1mH(Typical)		I_{AS}	18	
Avalanche Energy @ L=0.5mH		E_{AS}	25	mJ
Total Power Dissipation	T_C=25℃	P_D	31	W
	T_C=100℃		12.4	
	T_A=25℃	P_{DSM}	2.5 *2	
	T_A=70℃		1.6 *2	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	4	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	50 *2	

Note : 1. Pulse width limited by maximum junction temperature.
2. Surface mounted on a 1 in² pad of 2oz copper. In practice $R_{th,j-a}$ will be determined by customer's PCB characteristics. 125°C/W when mounted on a minimum pad of 2 oz. copper.

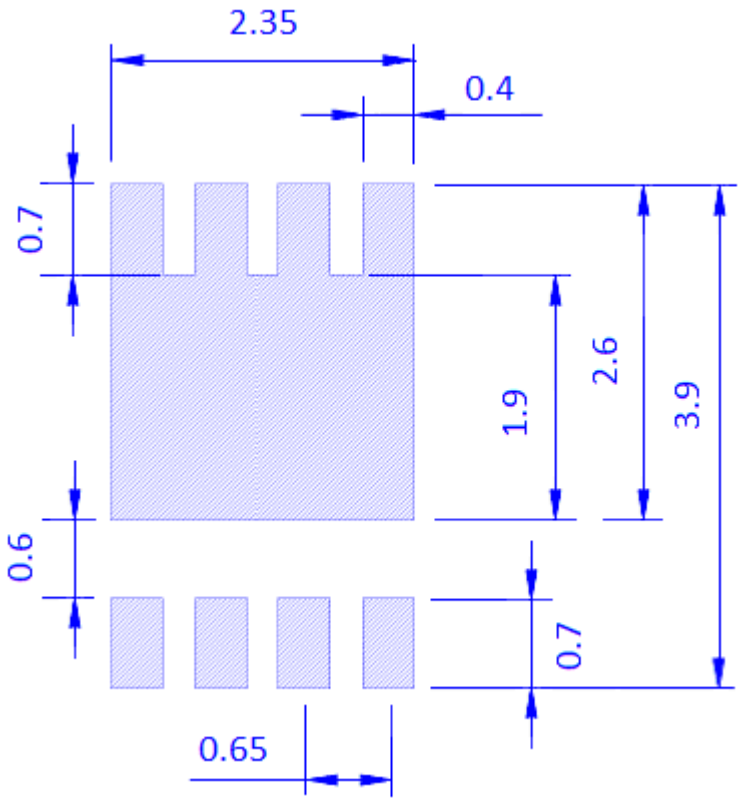
Characteristics (T_C=25°C, unless otherwise specified)

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} *1	-	6.5	-	S	V_{DS} =10V, I_D=7A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =100V, V_{GS} =0V
	-	-	10		V_{DS} =80V, V_{GS} =0V, Tj=85°C
$R_{DS(ON)}$ *1	-	25	35	mΩ	V_{GS} =10V, I_D=7A
	-	55	85		V_{GS} =6V, I_D=5A
Dynamic					
Ciss	-	877	-	pF	V_{DS}=50V, V_{GS}=0V, f=1MHz
Coss	-	109	-		
Crss	-	27	-		
Qg *1, 2	-	13.8	-	nC	V_{DS}=50V, V_{GS}=10V, I_D=10A
Qgs *1, 2	-	5.6	-		

Qgd *1, 2	-	3	-		
$t_{d(ON)}$ *1, 2	-	12.4	-	ns	V_{DS}=50V, I_D=20A, V_{GS}=10V, R_{GS}=3Ω
tr *1, 2	-	14.6	-		
$t_{d(OFF)}$ *1, 2	-	19	-		
t_f *1, 2	-	6.2	-		
Rg	-	1.4	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	23	A	
I_{SM} *3	-	-	92		
V_{SD} *1	-	0.78	1.2	V	I_S=2A, V_{GS}=0V
	-	0.84	1.3		I_S=7A, V_{GS}=0V
trr	-	30.4	-	ns	I_F=20A, dI_F/dt=100A/μs
Qrr	-	41.3	-	nC	

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

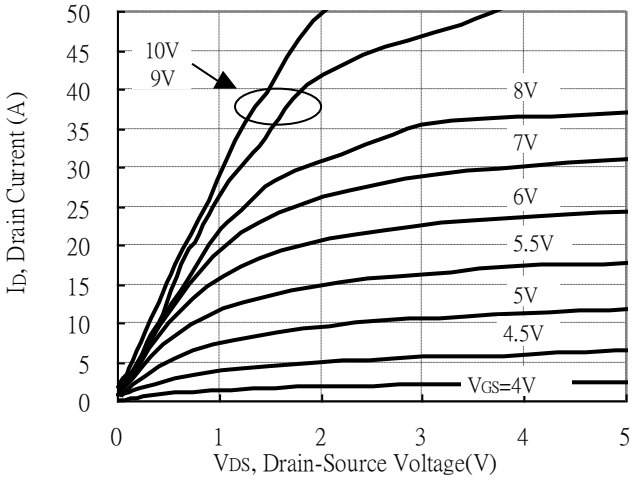
Recommended Soldering Footprint



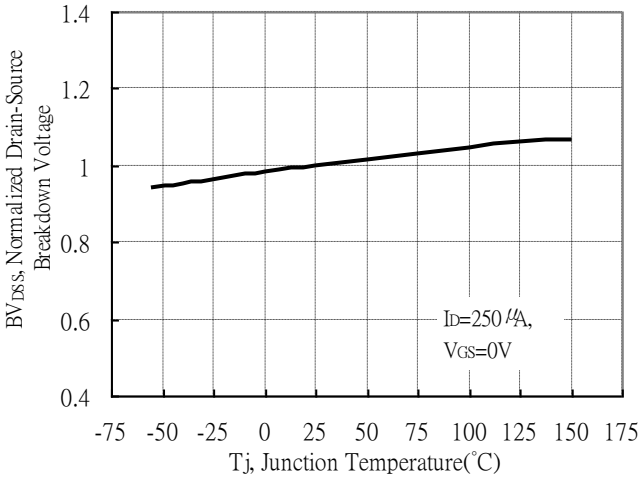
unit : mm

Typical Characteristics

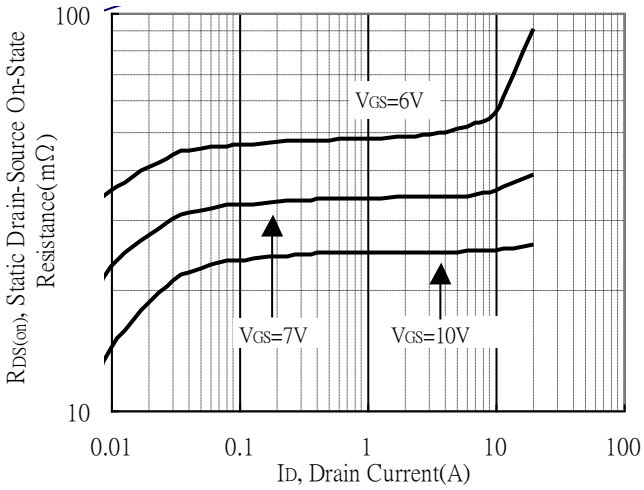
Typical Output Characteristics



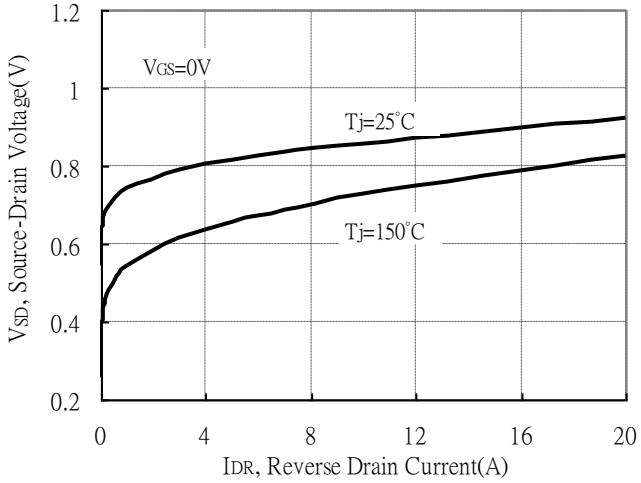
Brekdown Voltage vs Junction Temperature



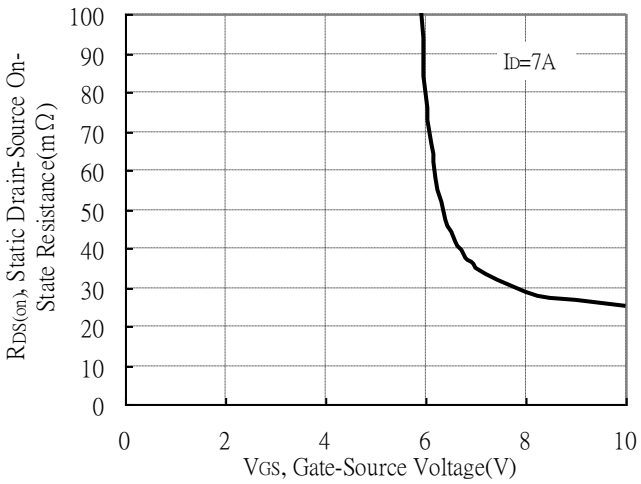
Static Drain-Source On-State resistance vs Drain Current



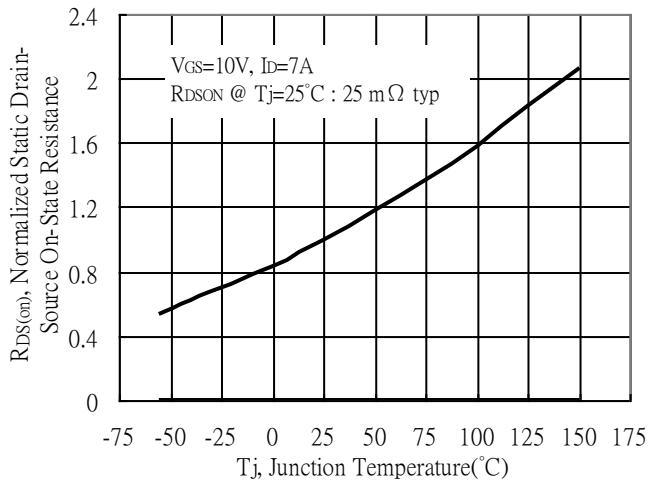
Reverse Drain Current vs Source-Drain Voltage



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

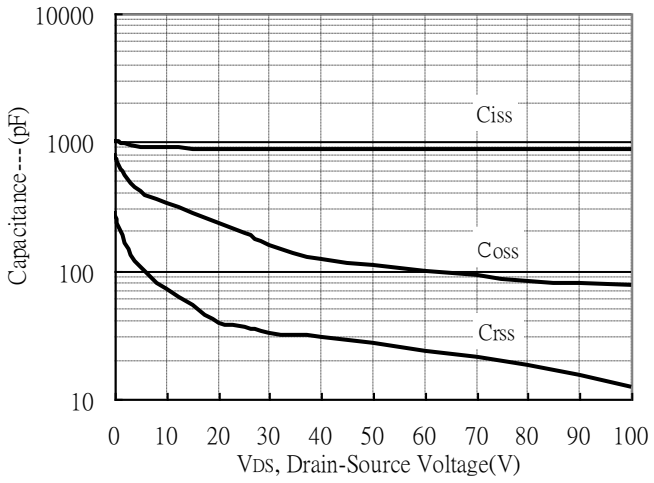


Drain-Source On-State Resistance vs Junction Tempearture

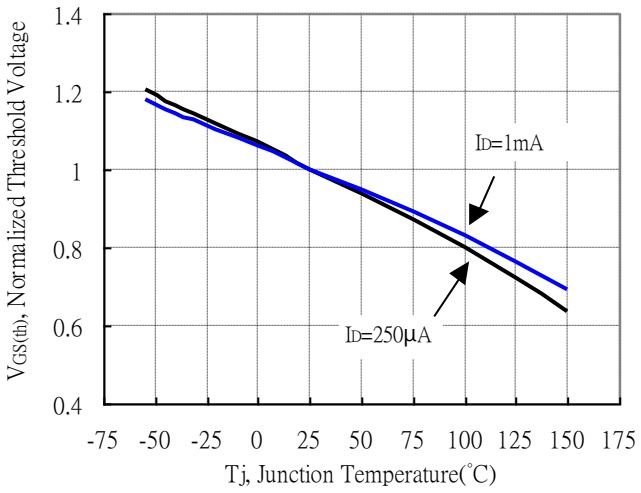


Typical Characteristics(Cont.)

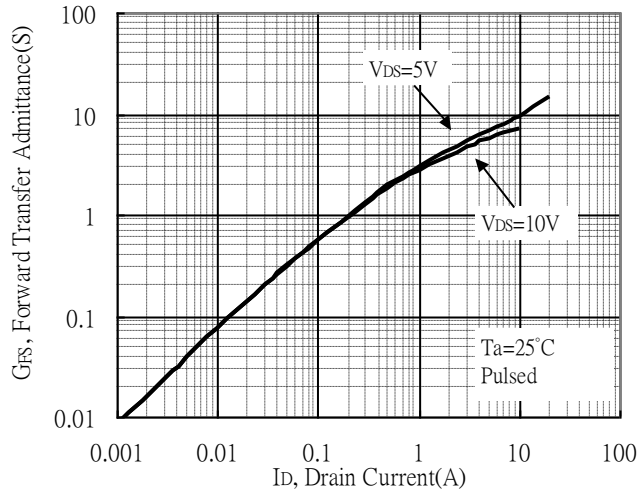
Capacitance vs Drain-to-Source Voltage



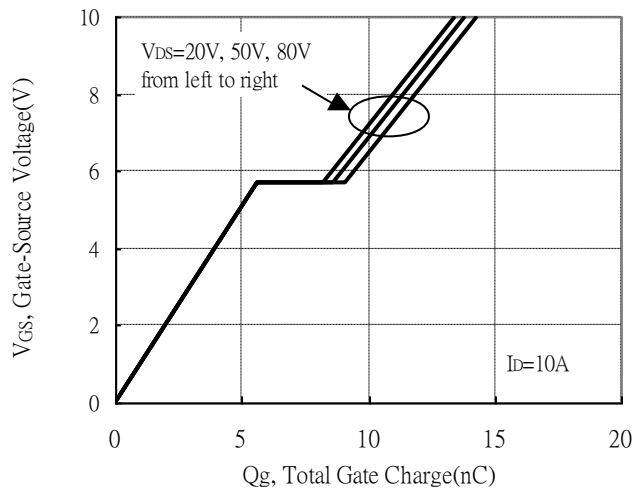
Threshold Voltage vs Junction Tempearture



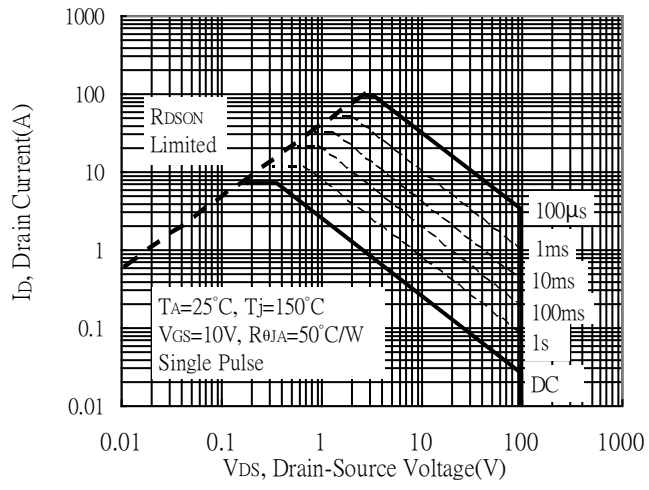
Forward Transfer Admittance vs Drain Current



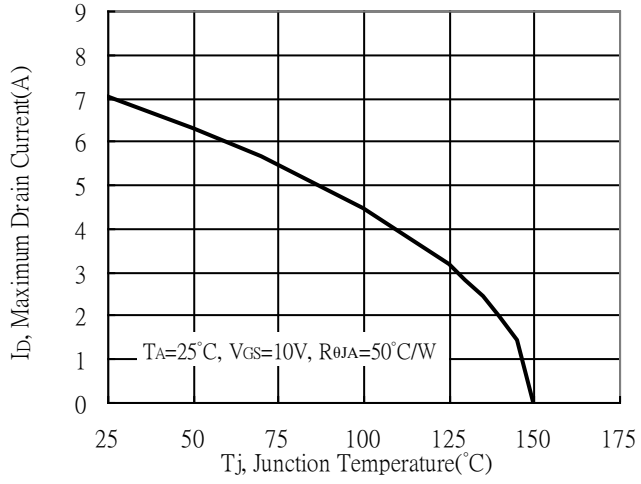
Gate Charge Characteristics



Maximum Safe Operating Area

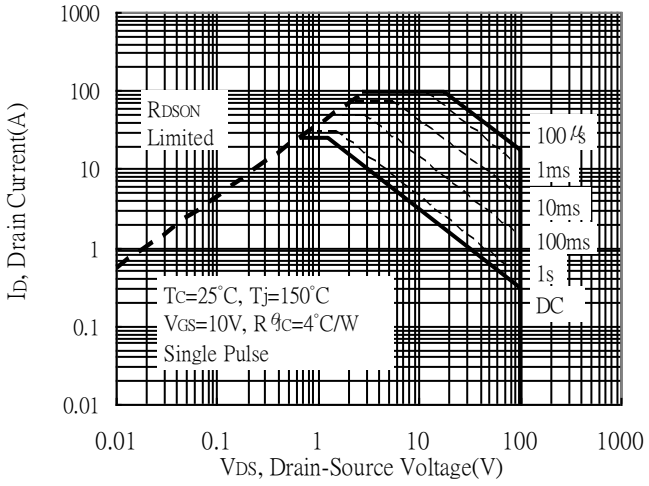


Maximum Drain Current vs Junction Temperature

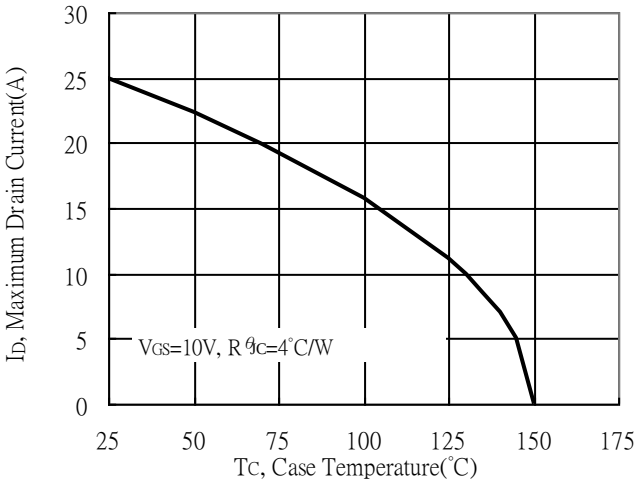


Typical Characteristics(Cont.)

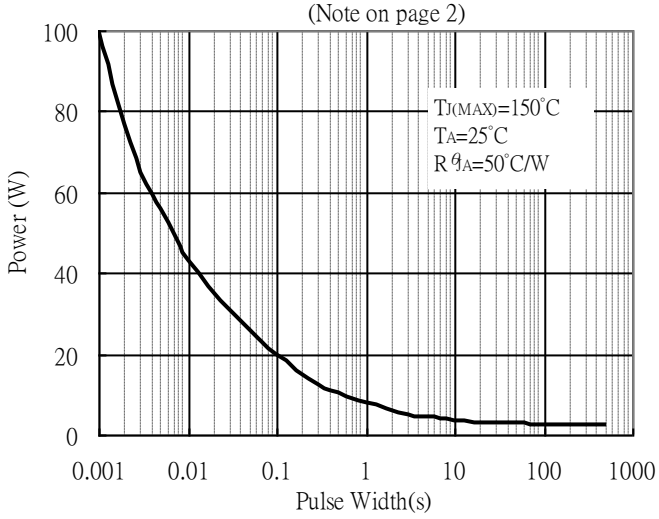
Maximum Safe Operating Area



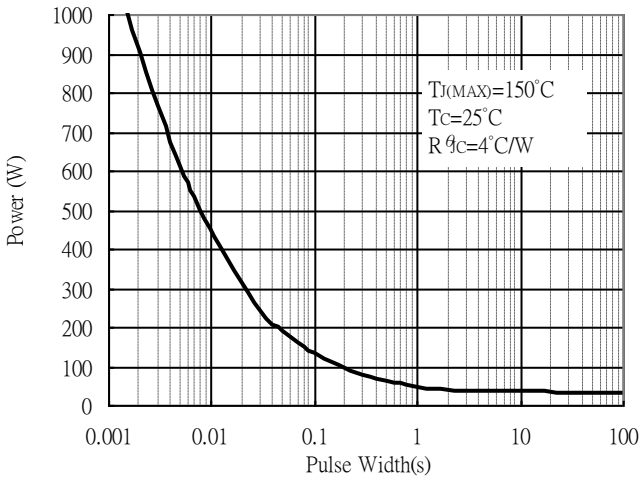
Maximum Drain Current vs Case Temperature



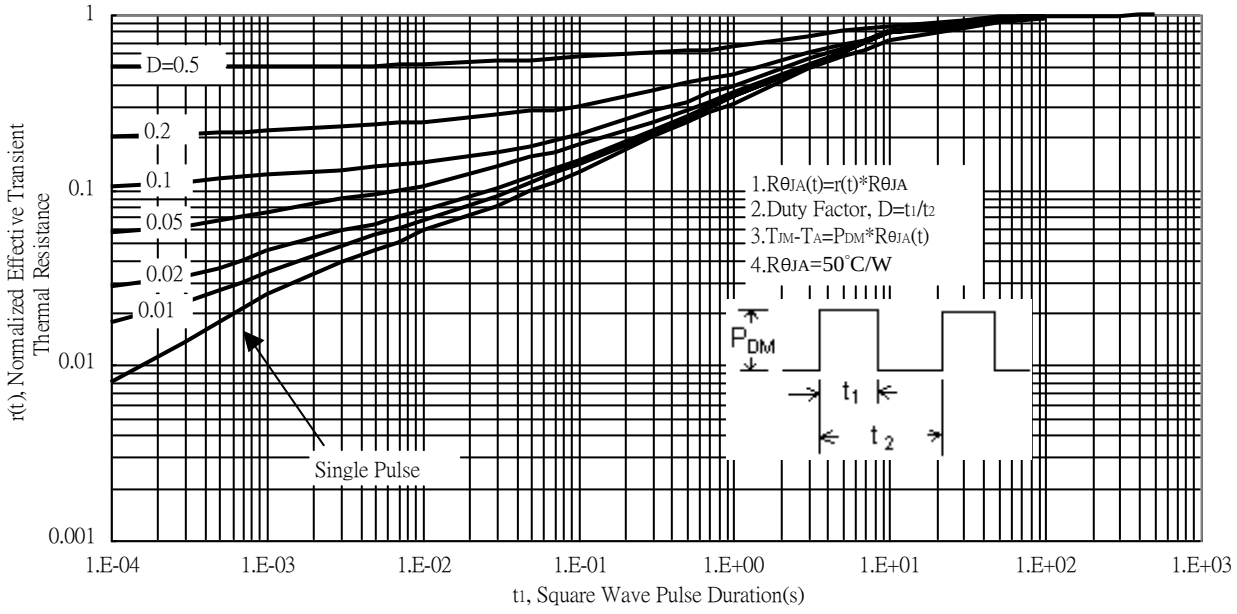
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



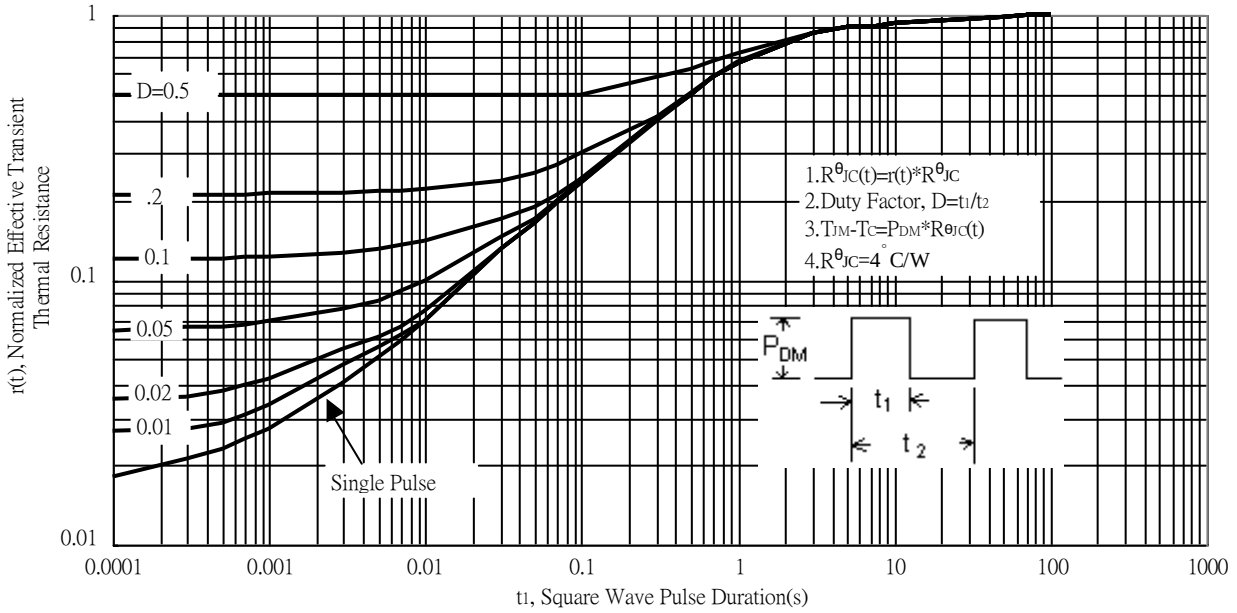
Single Pulse Power Rating, Junction to Case

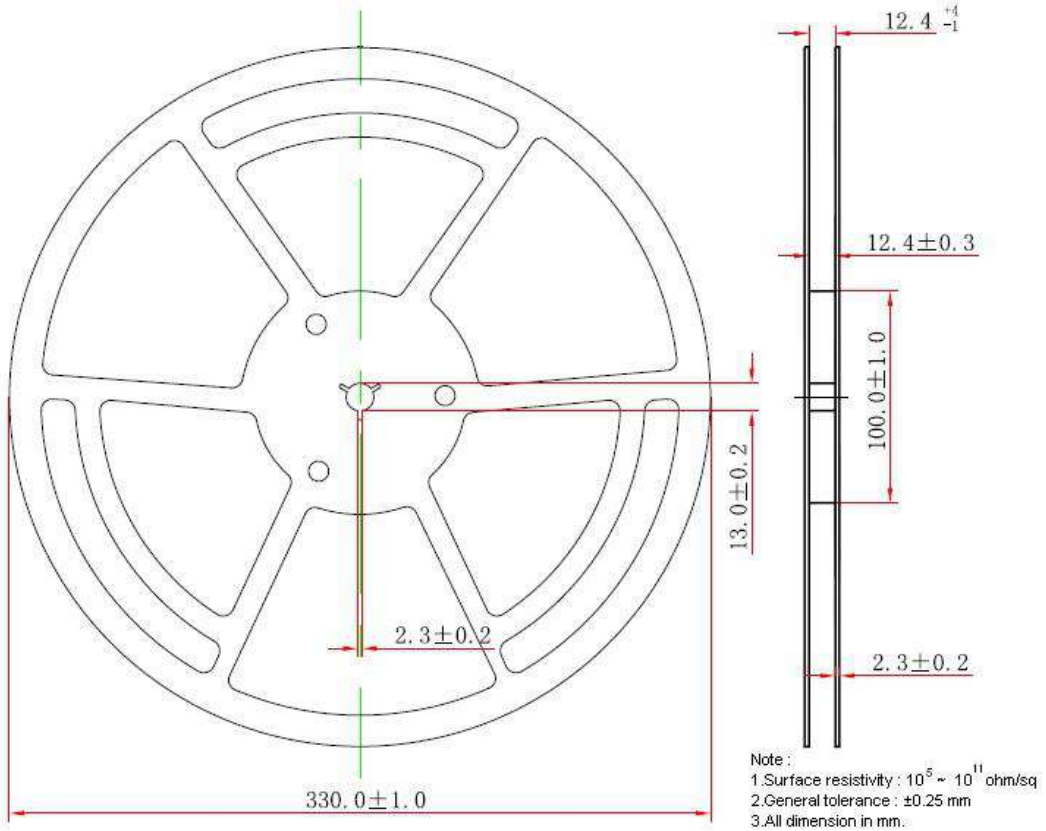


Transient Thermal Response Curves

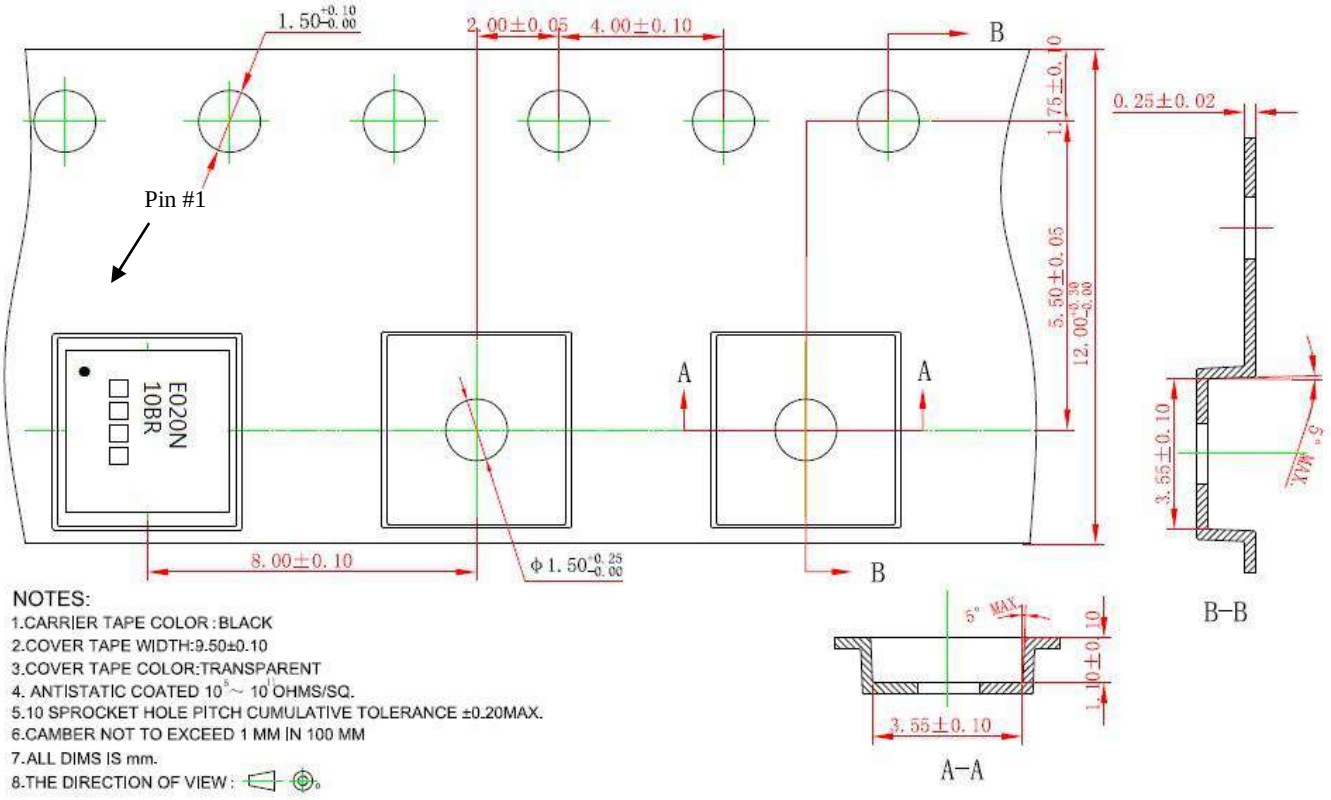


Transient Thermal Response Curves

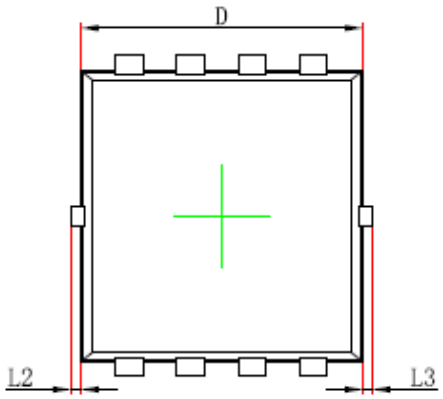




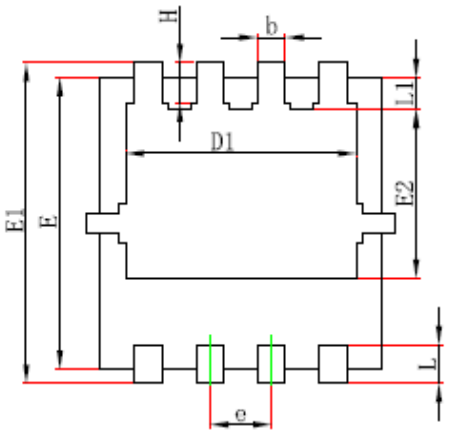
Carrier Tape Dimension



DFN3x3 Dimension

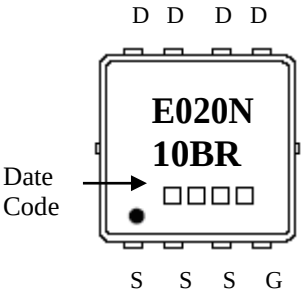


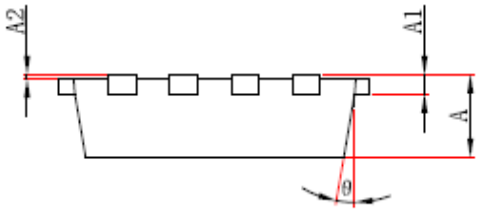
Top View



Bottom View

Marking:





Side View

8-Lead DFN3x3 Plastic Package

*: 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°