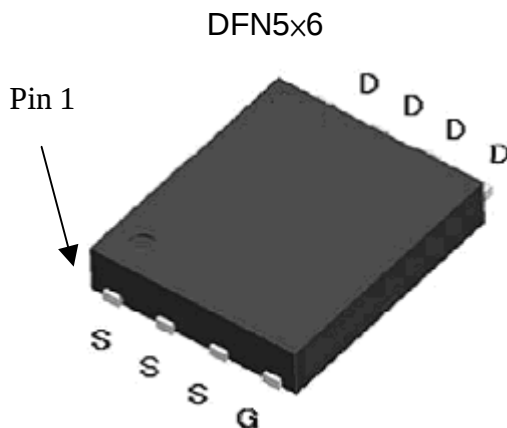


N-Channel Enhancement Mode Power MOSFET

Features:

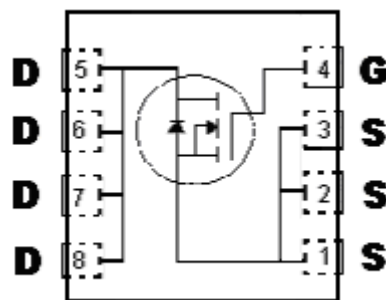
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free package

Outline



BV_{DSS}	80V
I_D@V_{GS}=10V, T_C=25°C	40A
I_D@V_{GS}=10V, T_A=25°C	10.5A
R_{DS(ON)}@V_{GS}=10V, I_D=10A	9.1 mΩ (typ)

Symbol



G : Gate D : Drain S : Source

Ordering Information

Device	Package	Shipping
KPRE013N08	DFN5x6 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (T_C=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage (Note 1)		V _{DS}	80	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current @T _C =25°C, V _{GS} =10V(silicon limit) (Note 4)		I _D	57	A
Continuous Drain Current @T _C =25°C, V _{GS} =10V(package limit) (Note 4)			40	
Continuous Drain Current @T _C =100°C, V _{GS} =10V			36	
Continuous Drain Current @T _A =25°C, V _{GS} =10V (Note 2)		I _{DSM}	10.5	
Continuous Drain Current @T _A =70°C, V _{GS} =10V (Note 2)			8.4	
Pulsed Drain Current (Note 1)		I _{DM}	160	
Single Pulse Avalanche Current @ L=0.1mH		I _{AS}	40	
Single Pulse Avalanche Energy @ L=5mH, I _D =20 Amps, V _{DD} =30V (Note 3)		E _{AS}	1000	mJ
Repetitive Avalanche Energy		E _{AR}	6.9	
Power Dissipation	T _C =25°C	P _D	69	W
	T _C =100°C		27	
	T _A =25°C (Note 2)	P _{DSM}	2.5	
	T _A =70°C (Note 2)		1.6	
Operating Junction and Storage Temperature		T _j , T _{stg}	-55~+150	

*Drain current limited by maximum junction temperature

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	1.8	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 2)	R _{θJA}	50	

Note : 1. Pulse width limited by junction temperature.

2. Surface mounted on 1 in² copper pad of FR-4 board, 125°C/W when mounted on minimum copper pad

3. Ratings are based on low frequency and low duty cycles to keep initial T_J=25 °C. 100% tested by conditions of V_{DD}=30V, I_D=20A, L=0.1mH, V_{GS}=10V.

4. Calculated continuous drain current based on maximum allowable junction temperature.

5. The static characteristics are obtained using <300μs pulses, duty cycle 0.5% maximum.

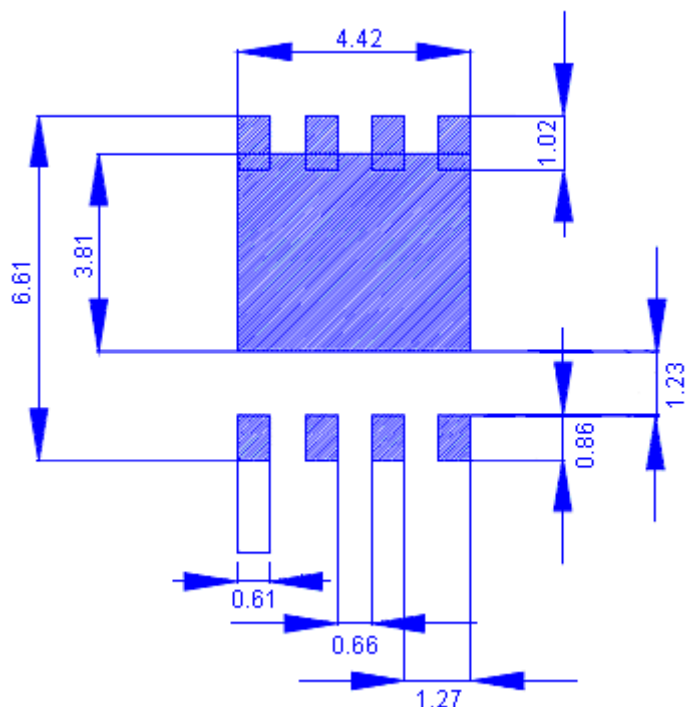
6. The R_{θJA} is the sum of thermal resistance from junction to case R_{θJC} and case to ambient.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	80	-	-	V	V _{GS} =0V, I _D =250μA
ΔBV _{DSS} /ΔTj	-	68	-	mV/°C	Reference to 25°C, I _D =250μA
V _{GS(th)}	2	-	4	V	V _{DS} = V _{GS} , I _D =250μA
*G _{FS}	-	19	-	S	V _{DS} =10V, I _D =20A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V
I _{DSS}	-	-	1	μA	V _{DS} =64V, V _{GS} =0V
	-	-	5		V _{DS} =64V, V _{GS} =0V, Tj=55°C
*R _{DS(ON)}	-	9.1	11.5	mΩ	V _{GS} =10V, I _D =10A
Dynamic					
*Q _g (V _{GS} =10V)	-	31.4	-	nC	V _{DS} =40V, V _{GS} =10V, I _D =10.5A
*Q _g (V _{GS} =8V)	-	26	-		
*Q _{gs}	-	7.3	-		
*Q _{gd}	-	10.1	-		
*t _{d(ON)}	-	18.6	-	ns	V _{DS} =40V, I _D =10.5A, V _{GS} =10V, R _{GS} =6Ω
*t _r	-	26.2	-		
*t _{d(OFF)}	-	46	-		
*t _f	-	15.8	-		
C _{iss}	-	1472	-	pF	V _{GS} =0V, V _{DS} =30V, f=1MHz
C _{oss}	-	200	-		
C _{rss}	-	105	-		
R _g	-	3.8	-	Ω	f=1MHz
Source-Drain Diode					
*I _S	-	-	40	A	
*I _{SM}	-	-	160		
*V _{SD}	-	0.74	1.1	V	I _S =2.8A, V _{GS} =0V
*t _{rr}	-	24.4	-	ns	V _{GS} =0V, I _F =10.5A, dI _F /dt=100A/μs
*Q _{rr}	-	26.9	-	nC	

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

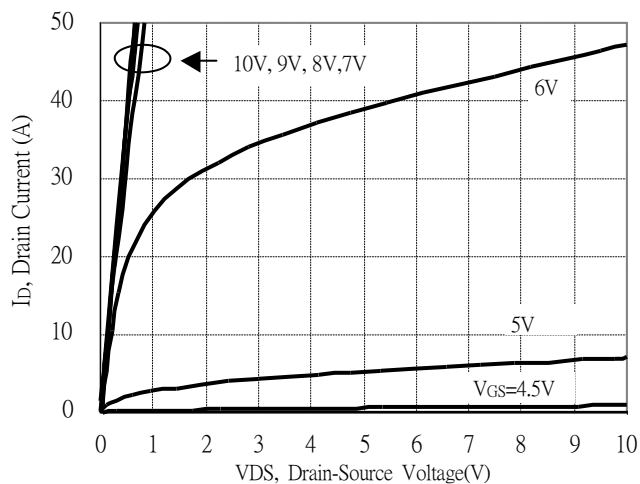
Recommended Soldering Footprint



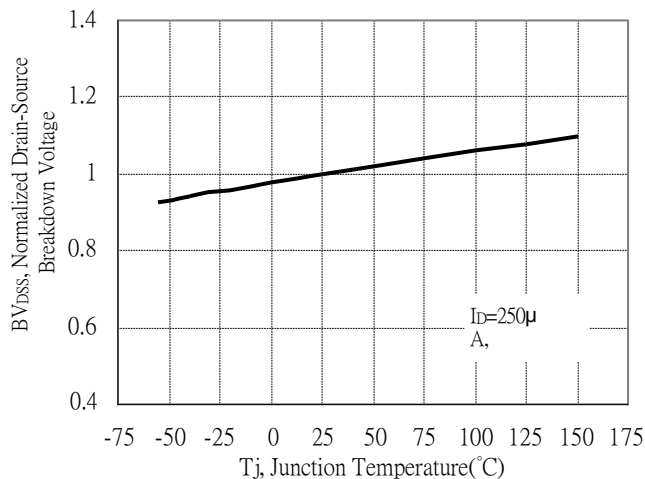
unit : mm

Typical Characteristics

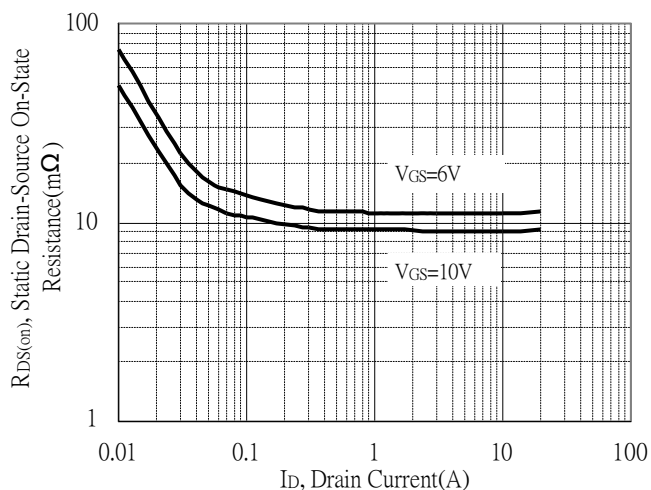
Typical Output Characteristics



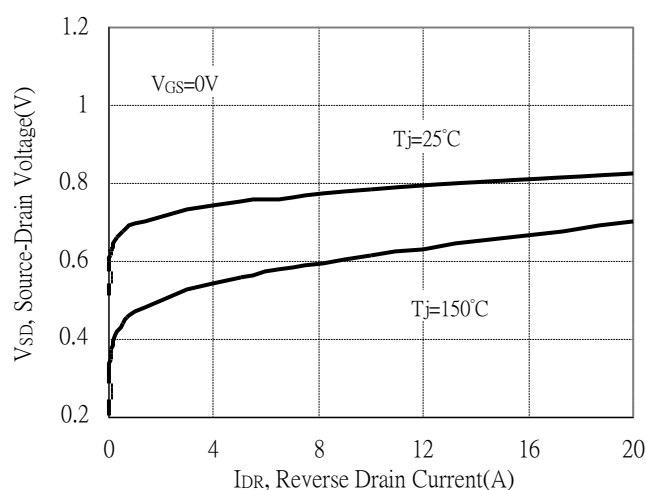
Breakdown Voltage vs Junction Temperature



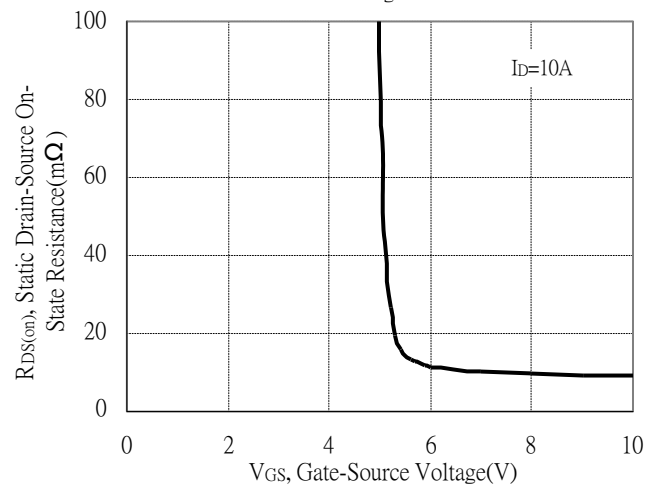
Static Drain-Source On-State resistance vs Drain Current



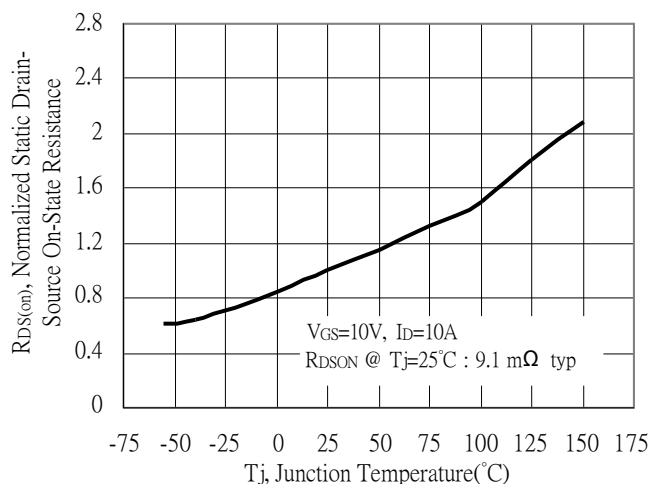
Reverse Drain Current vs Source-Drain Voltage



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

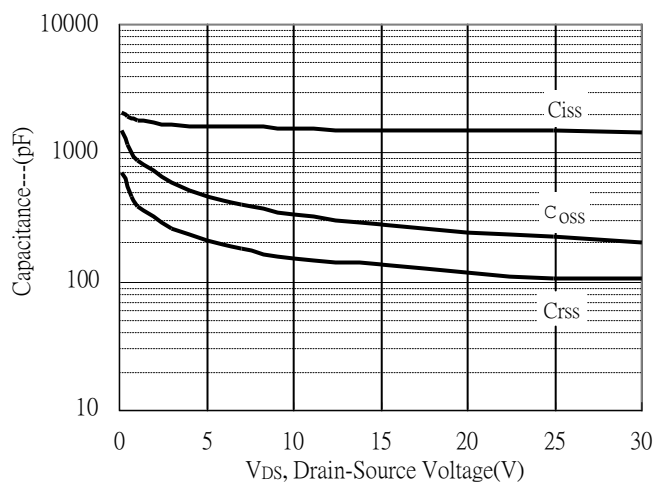


Drain-Source On-State Resistance vs Junction Temperature

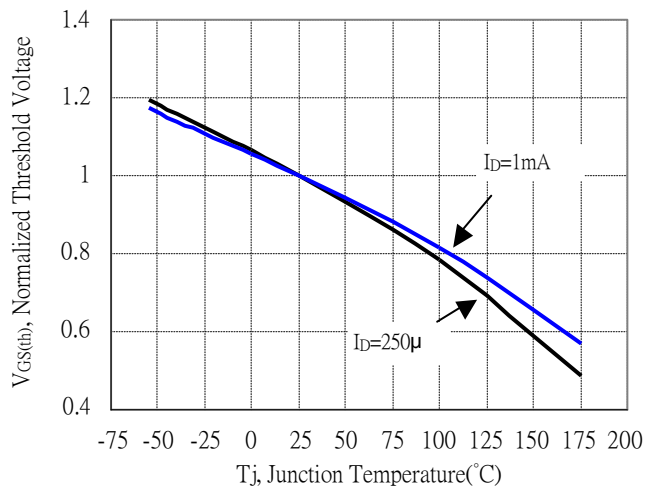


Typical Characteristics(Cont.)

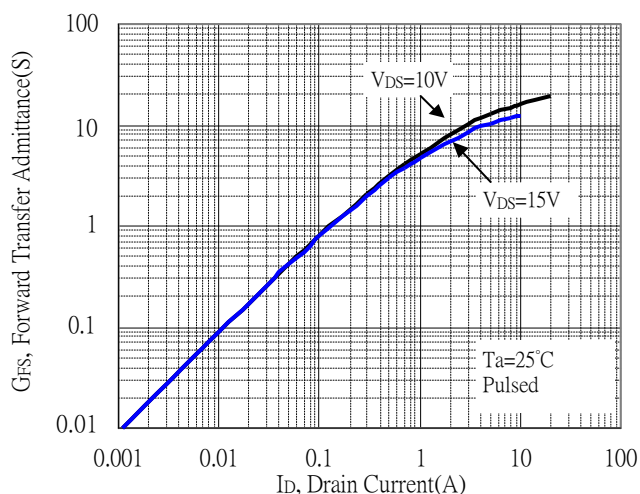
Capacitance vs Drain-to-Source Voltage



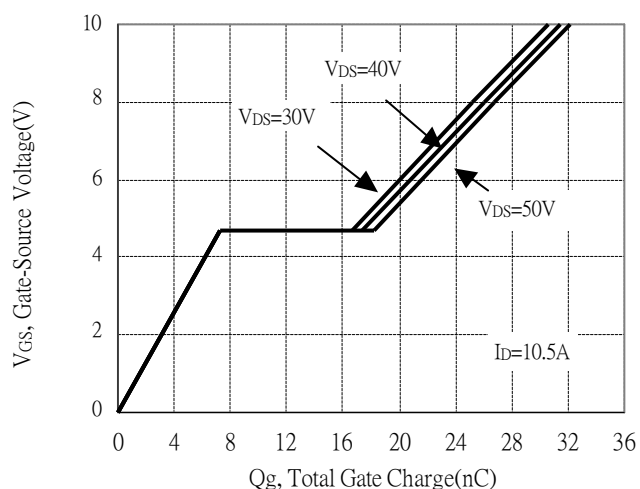
Threshold Voltage vs Junction Temperature



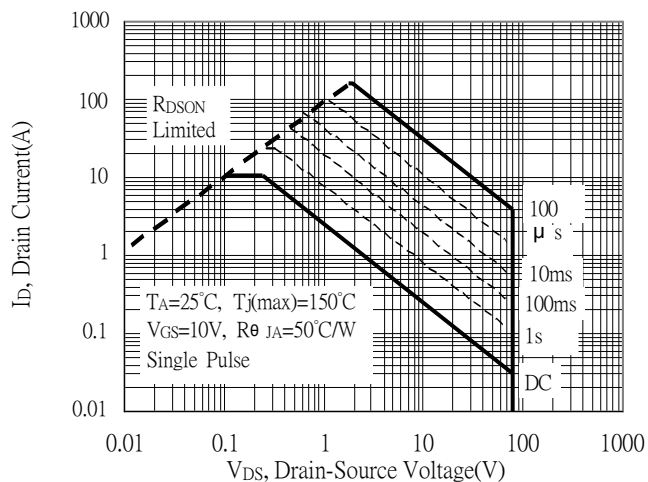
Forward Transfer Admittance vs Drain Current



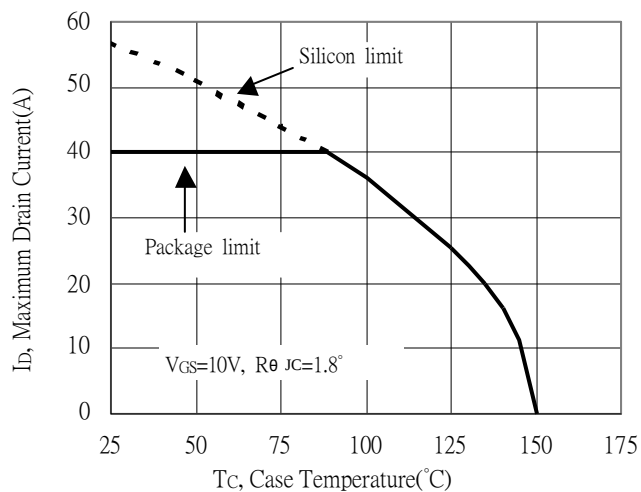
Gate Charge Characteristics



Maximum Safe Operating Area

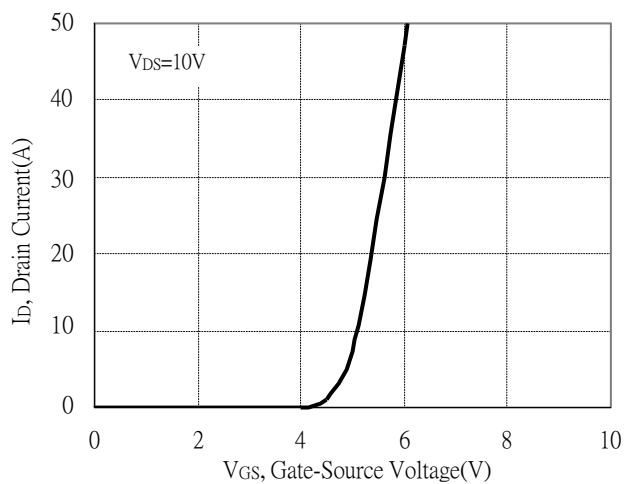


Maximum Drain Current vs Case Temperature

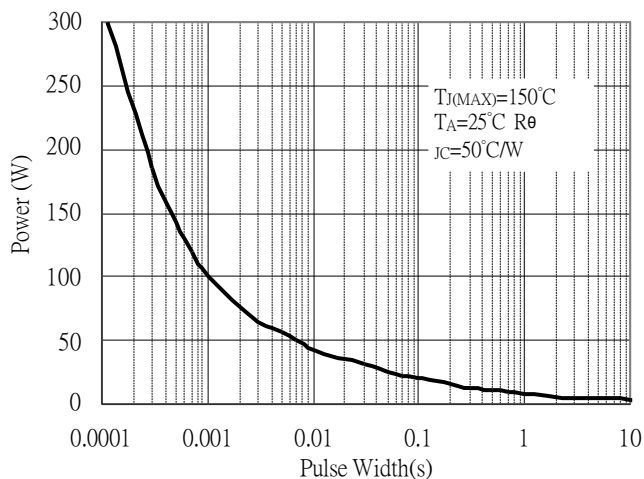


Typical Characteristics(Cont.)

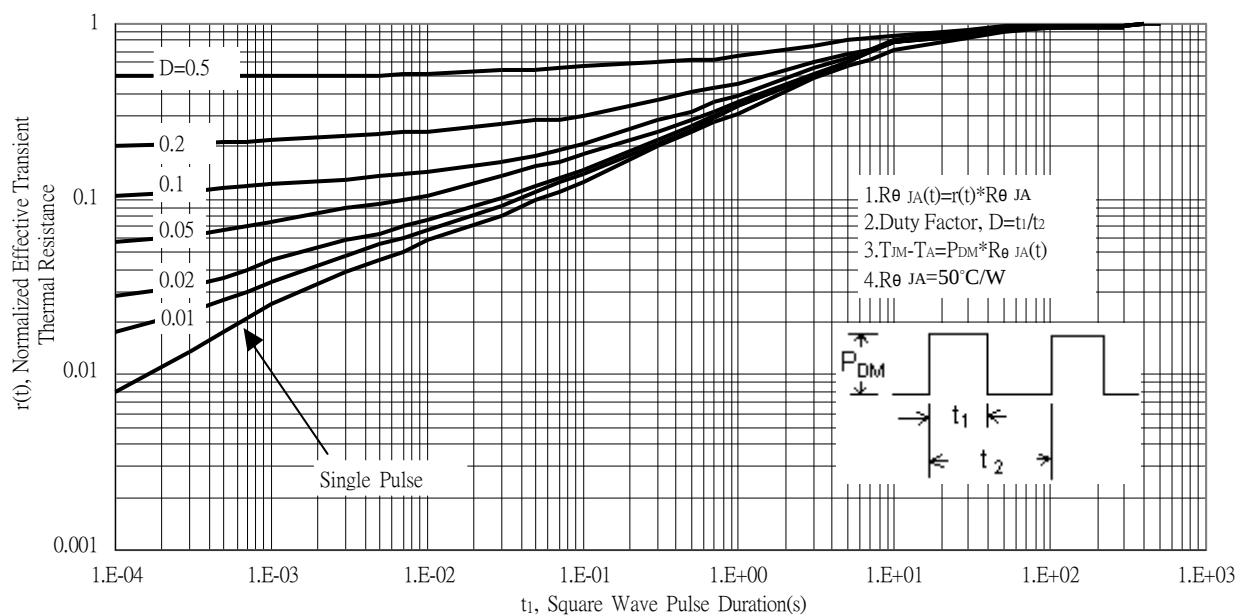
Typical Transfer Characteristics



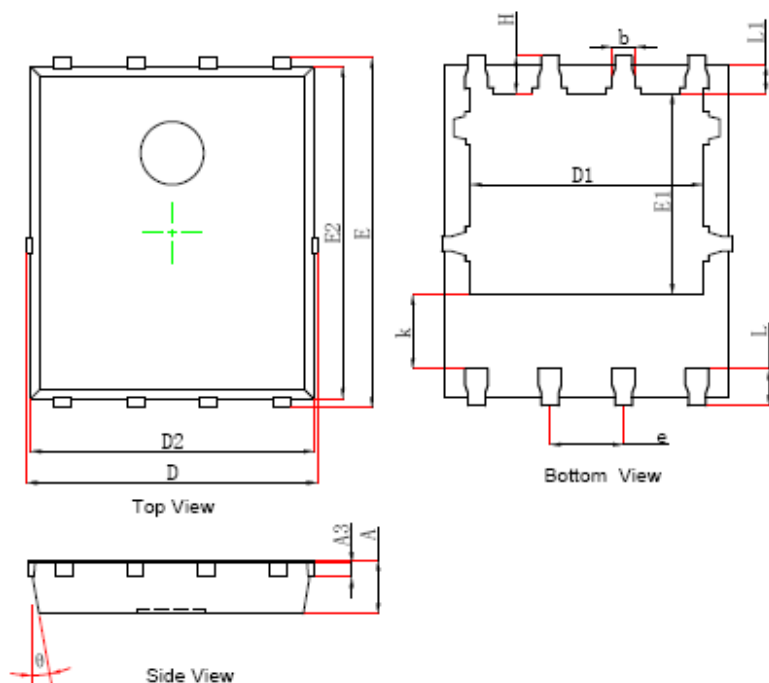
Single Pulse Power Rating, Junction to Case



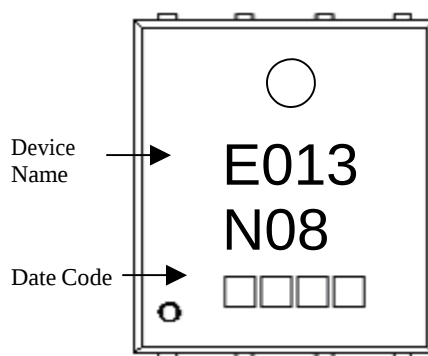
Transient Thermal Response Curves



DFN5x6 Dimension



Marking :



8-Lead DFN5x6 Plastic

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039	k	1.190	1.390	0.047	0.055
A3	0.254	REF	0.010	REF	b	0.350	0.450	0.014	0.018
D	4.944	5.096	0.195	0.201	e	1.270	TYP.	0.050	TYP.
E	5.974	6.126	0.235	0.241	L	0.559	0.711	0.022	0.028
D1	3.910	4.110	0.154	0.162	L1	0.424	0.576	0.017	0.023
E1	3.375	3.575	0.133	0.141	H	0.574	0.726	0.023	0.029
D2	4.824	4.976	0.190	0.196	θ	10°	12°	10°	12°
E2	5.674	5.826	0.223	0.229					