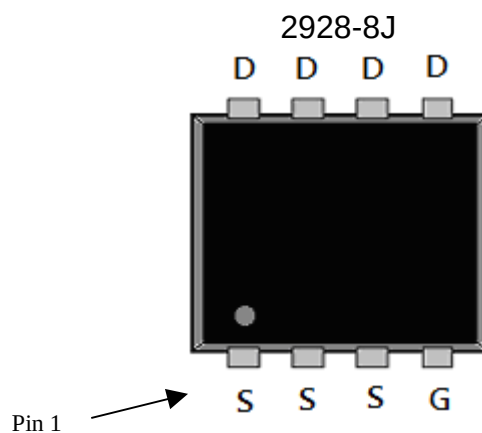


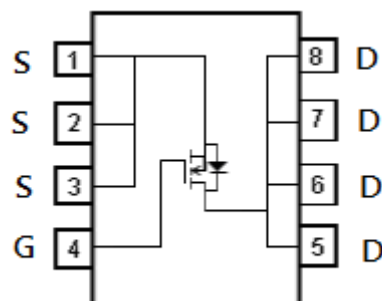
P-Channel Enhancement Mode MOSFET

Features:

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



BVDSS	-30V
ID@VGS=-10V, TC=25°C	-9A
ID@VGS=-10V, TA=25°C	-6.4A
RDSON@VGS=-10V, ID=-10A	19mΩ (typ.)
RDSON@VGS=-4.5V, ID=-7A	32mΩ (typ.)



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KWP4435	2928-8J (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter		Symbol	Limits	Unit
Drain-Source Breakdown Voltage		BV _{DSS}	-30	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current	T _C =25 °C, V _{GS} =-10V	I _D	-9	A
	T _C =70 °C, V _{GS} =-10V		-7.2	
Continuous Drain Current	T _A =25 °C, V _{GS} =-10V		-6.4	
	T _A =70 °C, V _{GS} =-10V		-5.1	
Pulsed Drain Current * 3		I _{DM}	-45	
Total Power Dissipation	T _A =25°C	P _{DSM}	1.6 *2	W
	T _A =70°C		1.0 *2	
	T _C =25°C	P _D * 1	3.1	
	T _C =70°C		2.0	
Operating Junction and Storage Temperature Range		T _j ; T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Max. Thermal Resistance, Junction-to-ambient, steady state	R _{θJA}	80 *2	°C/W
Max. Thermal Resistance, Junction-to-case	R _{θJC}	40	

Note : 1.The power dissipation P_D is based on T_{J(MAX)}=150 °C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

2. The value of R_{θJA} is measured with the device mounted on 1 in²FR-4 board with 2 oz. copper, in a still air environment with T_A=25 °C. 216 °C/W when mounted on a minimum pad of 2 oz. copper. The power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150 °C. The value in any given application depends on the user's specific board design.

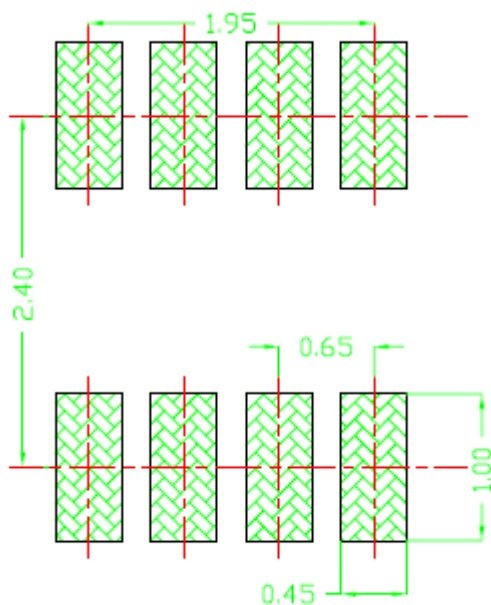
3. Pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low duty cycles to keep initial T_J=25 °C.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-30	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-1	-	-2.5		V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-30V, V _{GS} =0V
	-	-	-10		V _{DS} =-24V, V _{GS} =0V, T _j =70°C
*R _{DS(ON)}	-	19	25	mΩ	V _{GS} =-10V, I _D =-10A
	-	32	45		V _{GS} =-4.5V, I _D =-7A
*G _{FS}	-	11	-	S	V _{DS} =-10V, I _D =-5A
Dynamic					
C _{iss}	-	1478	-	pF	V _{DS} =-15V, V _{GS} =0V, f=1MHz
C _{oss}	-	176	-		
C _{rss}	-	152	-		
*t _{d(ON)}	-	10	-	ns	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V, R _G =3Ω
*t _r	-	17.2	-		
*t _{d(OFF)}	-	61	-		
*t _f	-	13	-		
*Q _g	-	33.3	50	nC	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V
*Q _{gs}	-	4.7	-		
*Q _{gd}	-	6.9	-		
R _g	-	6.6	-	Ω	f=1MHz
Body Diode					
*I _S	-	-	-4	A	
*I _{SM}	-	-	-16		
*V _{SD}	-	-0.75	-1	V	V _{GS} =0V, I _S =-1A
*t _{rr}	-	12	-	ns	I _F =-10A, V _{GS} =0V, dI _F /dt=100A/μs
*Q _{rr}	-	7	-	nC	

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

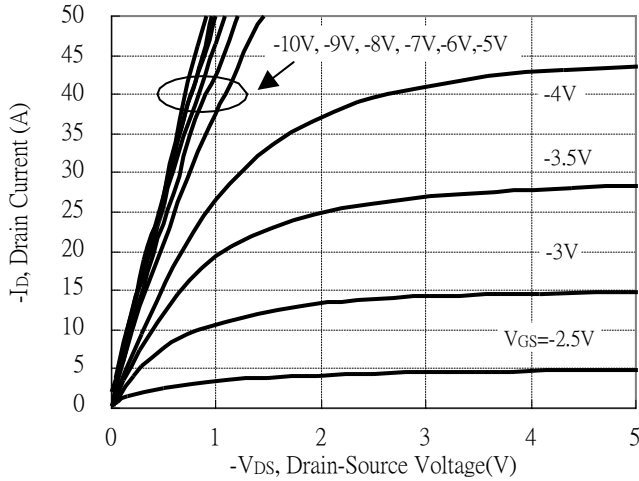
Recommended Soldering Footprint



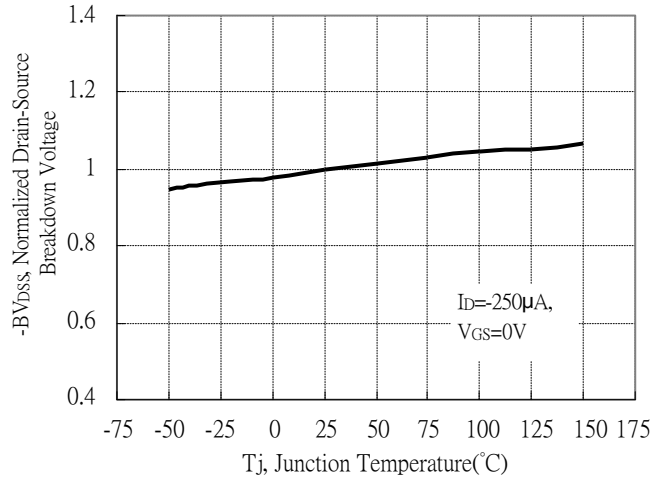
unit : mm

Typical Characteristics :

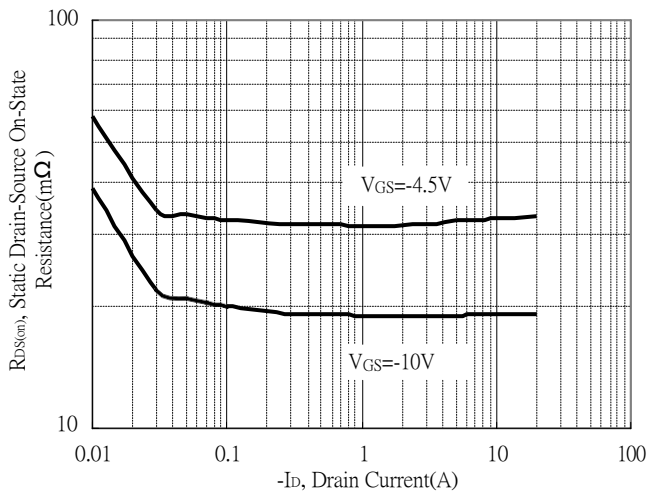
Typical Output Characteristics



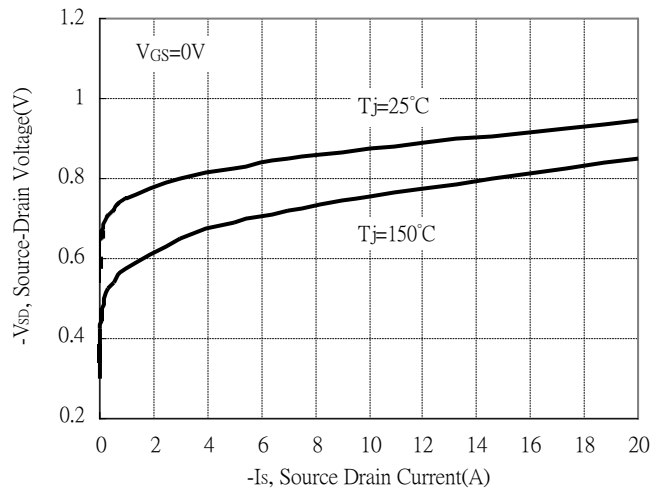
Breakdown Voltage vs Ambient Temperature



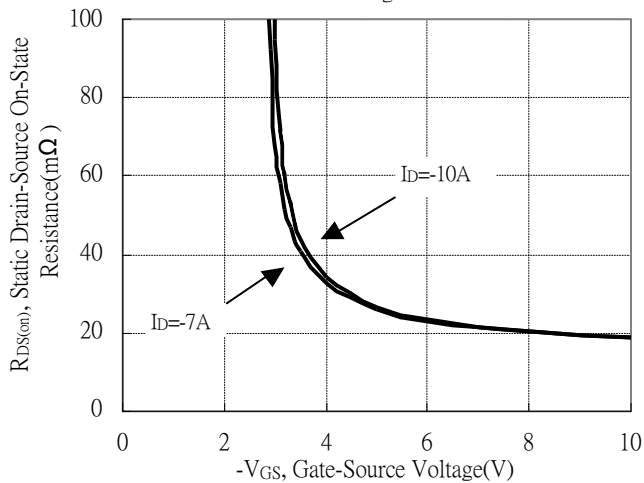
Static Drain-Source On-State resistance vs Drain Current



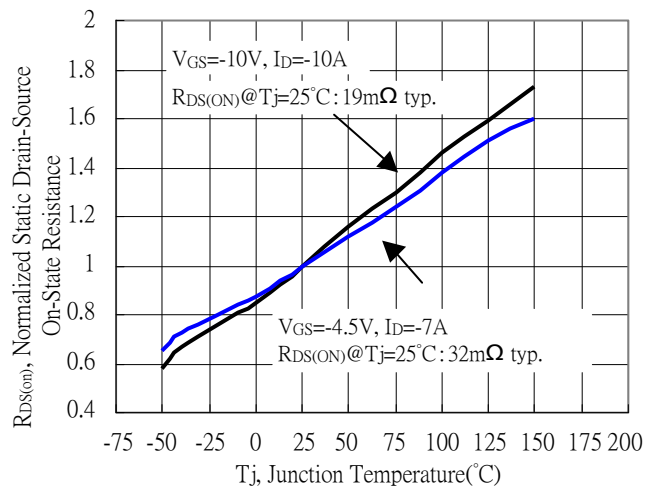
Source Drain Current vs Source-Drain Voltage



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

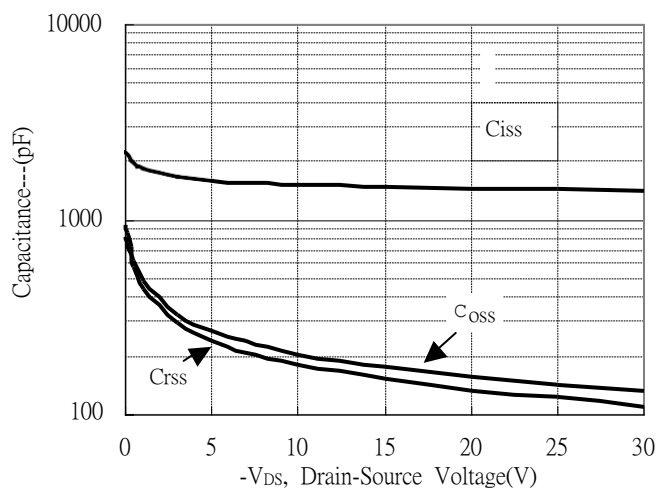


Drain-Source On-State Resistance vs Junction Temperature

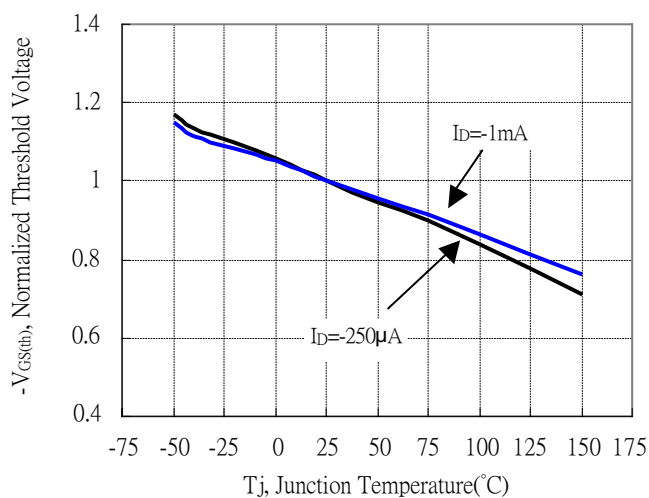


Typical Characteristics(Cont.) :

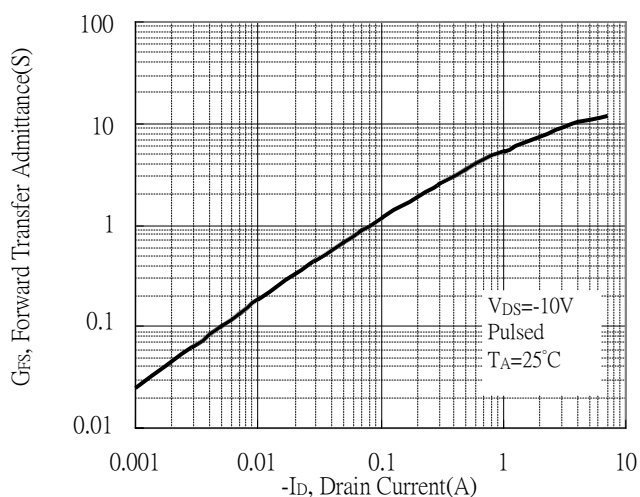
Capacitance vs Drain-to-Source Voltage



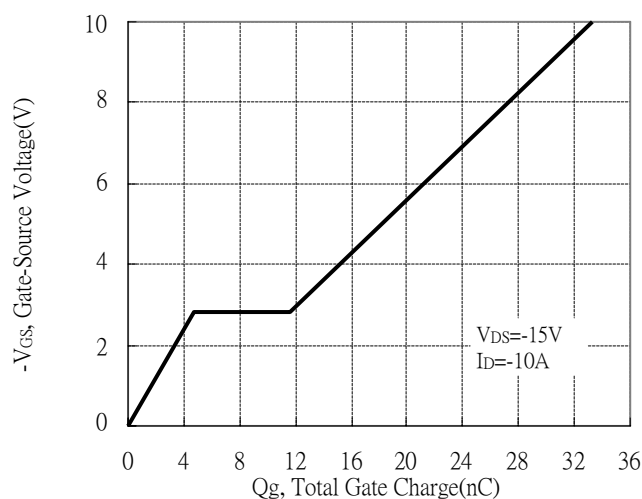
Threshold Voltage vs Junction Temperature



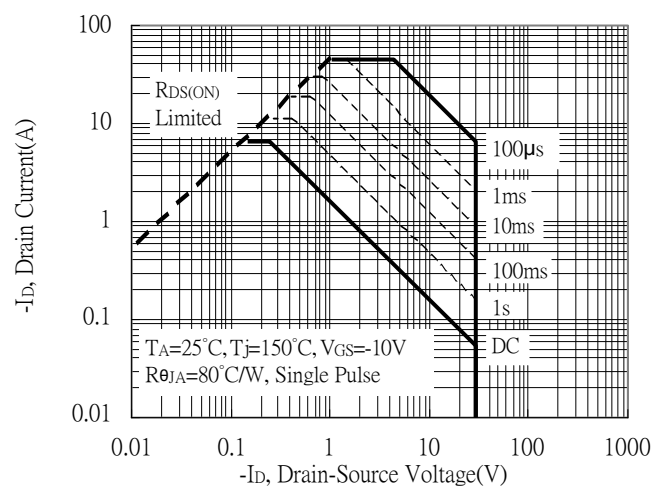
Forward Transfer Admittance vs Drain Current



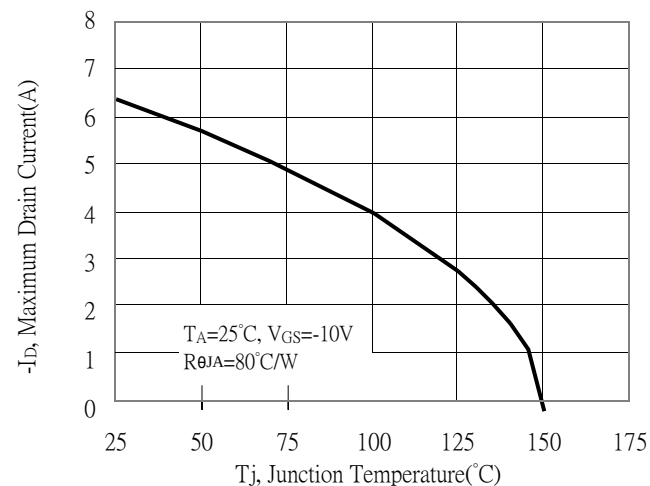
Gate Charge Characteristics



Maximum Safe Operating Area

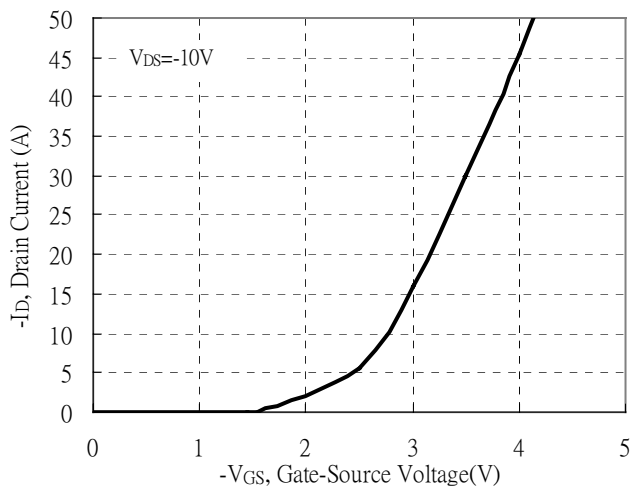


Maximum Drain Current vs Junction Temperature

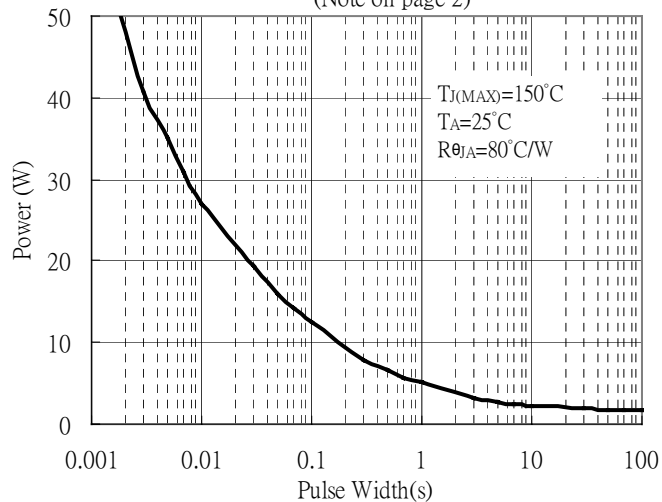


Typical Characteristics(Cont.) : Q1(N-channel)

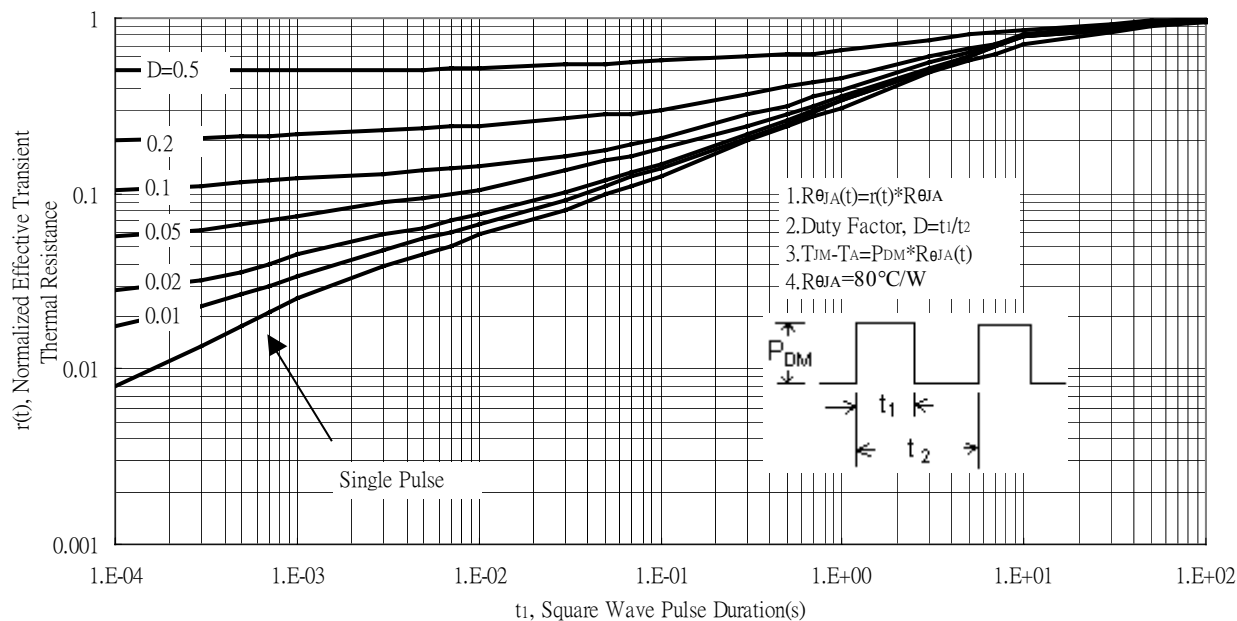
Typical Transfer Characteristics



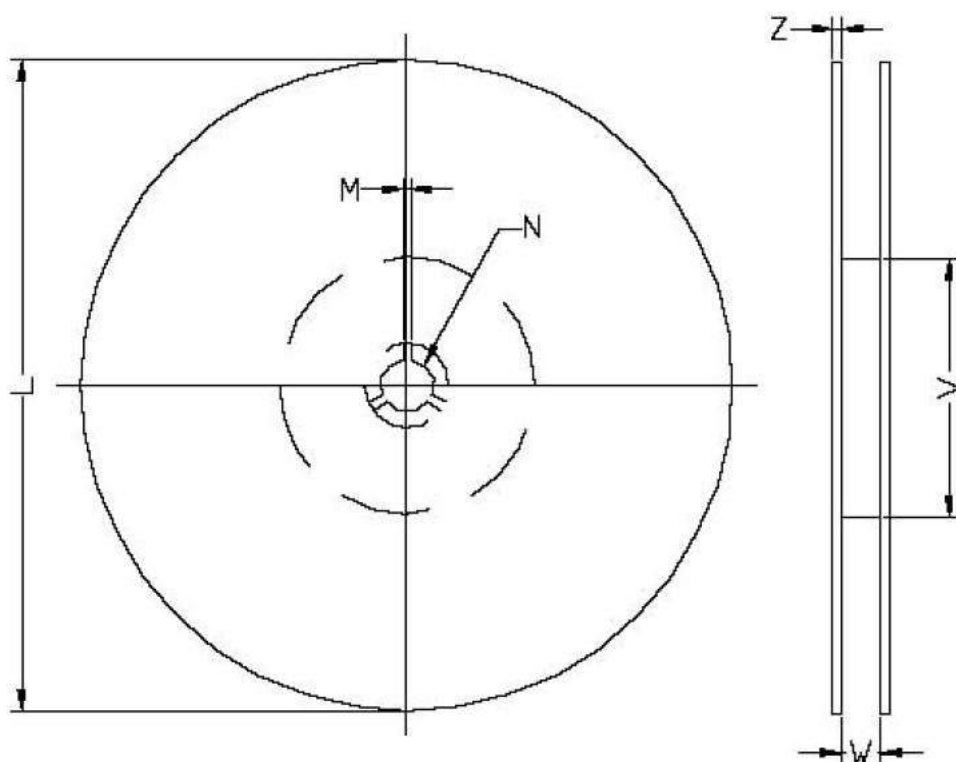
Single Pulse Power Rating, Junction to Ambient
 (Note on page 2)



Transient Thermal Response Curves



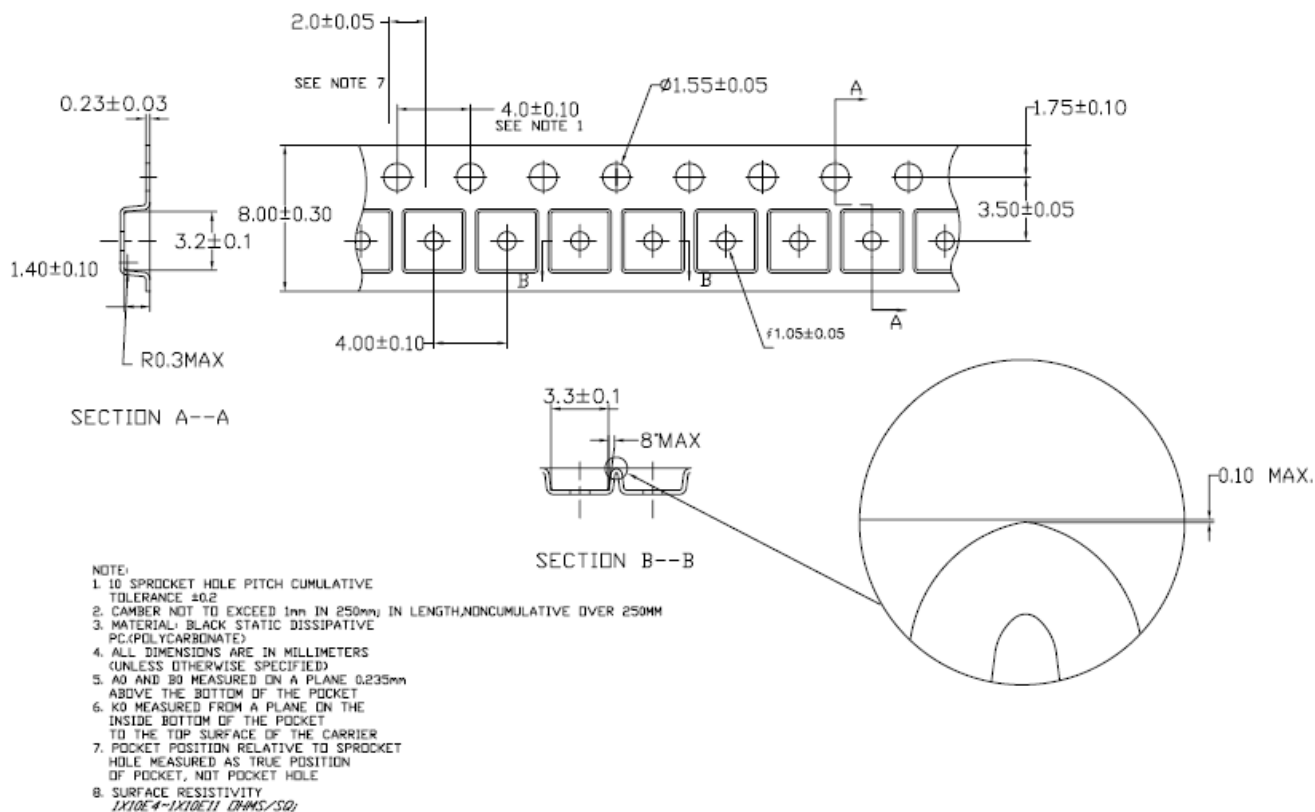
Reel Dimension



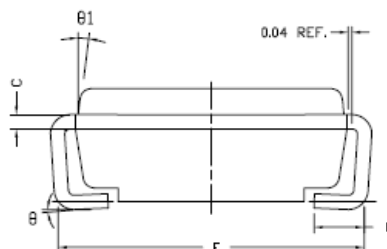
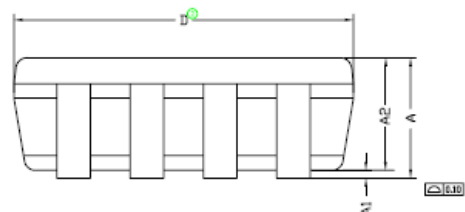
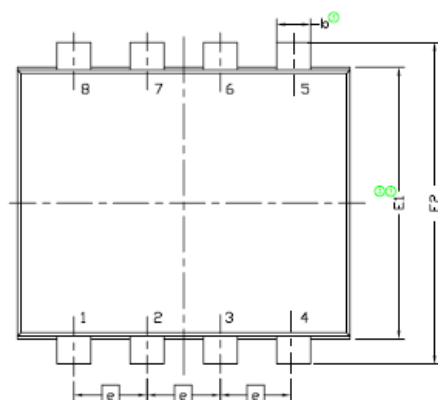
Unit: mm

MAIN DIM	Min	Max
L	177	179
M	1.5	2.5
N	12.8	14.0
V	<u>76</u>	<u>78</u>
W	8.4	9.9
Z	0.9	1.5

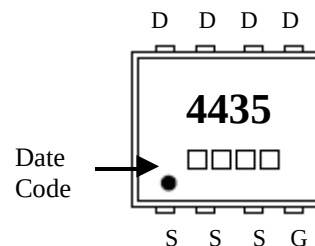
Carrier Tape Dimension



2928-8J Dimension



Marking:



8-Lead 2928-8J Plastic Package

Note:

1. All Dimension Are In mm.
2. Package Body Sizes Exclude Mold Flash, Protrusion Or Gate Burrs.
Mold Flash, Protrusion Or Gate Burrs Shall Not Exceed 0.10 mm Per Side.
3. Package Body Sizes Determined At The Outermost Extremes Of The Plastic Body Exclusive Of Mold Flash, Tie Bar Burrs, Gate Burrs And Interlead Flash, But Including Any Mismatch Between The Top And Bottom Of The Plastic Body.
4. The Package Top May Be Smaller Than The Package Bottom.
5. Dimension "b" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.08 mm Total In Excess Of "b" Dimension At Maximum Material Condition. The Dambar Cannot Be Located On The Lower Radius Of The Foot.

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.935	1.100	0.0368	0.0433	E1	2.300	2.500	0.0906	0.0984
A1	0.010	0.100	0.0004	0.0039	E2	2.650	3.050	0.1043	0.1201
A2	0.925	1.000	0.0364	0.0394	e	0.65	BSC	0.0256	BSC
b	0.250	0.400	0.0098	0.0157	L	0.300	0.600	0.0118	0.0236
c	0.100	0.200	0.0039	0.0079	θ	0°	8°	0°	8°
D	2.950	3.100	0.1161	0.1220	θ1	7°	TYP	7°	TYP
E	2.500	3.000	0.0984	0.1181					