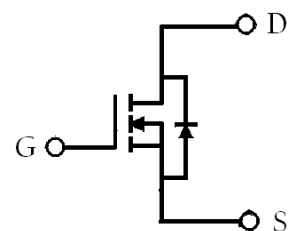
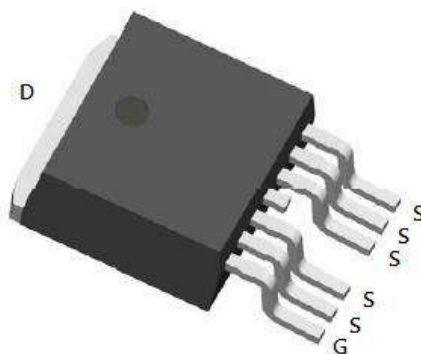


N-Channel Enhancement Mode Power MOSFET

Features:

- Simple Drive Requirement
- Fast Switching Characteristic
- RoHS compliant package

TO-263-7L-4C



G : Gate D : Drain S : Source

BV_{DSS}	40V
$I_D @ V_{GS}=10V, T_C=25^\circ C$	172A
$R_{DS(on)(TYP)} @ V_{GS}=10V, I_D=50A$	0.78m Ω

Ordering Information

Device	Package	Shipping
KWE1D0N04	TO-263-7L-4C (Pb-free lead plating and RoHS compliant package)	800 pcs / Tape & Reel

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

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±30	
Continuous Drain Current @ T _C =25°C(silicon limit)	I _D	294	A
Continuous Drain Current @ T _C =100°C(silicon limit)		208	
Continuous Drain Current @ T _C =25°C(package limit) (Note 1)		172	
Pulsed Drain Current (Note 3)	I _{DM}	999	
Continuous Drain Current @ T _A =25°C (Note 2)	I _{DSM}	29.2	
Continuous Drain Current @ T _A =70°C (Note 2)		23.4	
Avalanche Current @ L=0.1mH (Note 3)	I _{AS}	100	mJ
Avalanche Energy @ L=1mH, I _D =73A, V _{DD} =30V (Note 4)	E _{AS}	2664	
Power Dissipation	P _D	T _C =25°C (Note 1)	W
		T _C =100°C (Note 1)	
Power Dissipation	P _{DSM}	T _A =25°C (Note 2)	
		T _A =70°C (Note 2)	
Operating Junction and Storage Temperature	T _J , T _{stg}	-55~+175	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	0.6	°C/W
Thermal Resistance, Junction-to-ambient, max, (Note 2)	R _{θJA}	62.5	

Note : 1.The power dissipation P_D is based on T_{J(MAX)}=175 °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 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25 °C. 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, and the maximum temperature of 175°C may be used if the PCB allows it.

3. Pulse width limited by junction temperature T_{J(MAX)}=175 °C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

4. 100% tested by conditions of L=1mH, I_{AS}=50A, V_{GS}=10V, V_{DD}=30V.

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.

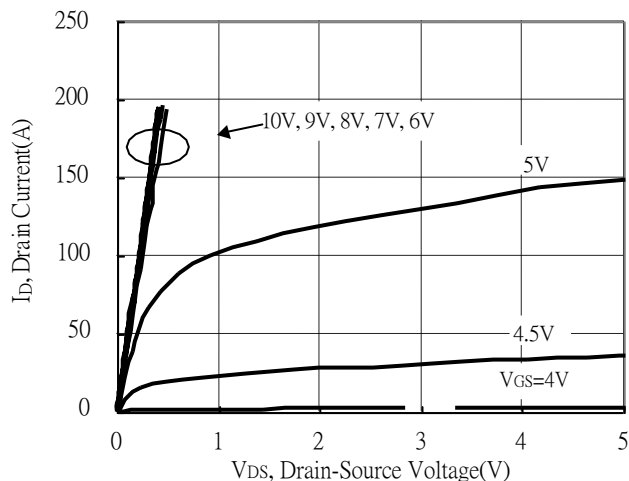
Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	40	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	2.0	-	4.0		V _{DS} = V _{GS} , I _D =250μA
G _{FS}	-	50.4	-	S	V _{DS} =10V, I _D =20A
I _{GSS}	-	-	±100	nA	V _{GS} =±30V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =32V, V _{GS} =0V
	-	-	25		V _{DS} =32V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	0.78	1.1	mΩ	V _{GS} =10V, I _D =50A
Dynamic					
*Q _g	-	246.6	-	nC	I _D =20A, V _{DS} =20V, V _{GS} =10V
*Q _{gs}	-	54	-		
*Q _{gd}	-	70.7	-		
*t _{d(ON)}	-	61.2	-	ns	V _{DS} =20V, I _D =20A, V _{GS} =10V, R _G =1Ω
*t _r	-	43.4	-		
*t _{d(OFF)}	-	132.8	-		
*t _f	-	36.2	-		
C _{iss}	-	12080	-	pF	V _{GS} =0V, V _{DS} =30V, f=1MHz
C _{oss}	-	1323	-		
C _{rss}	-	607	-		
R _g	-	1.4	-	Ω	f=1MHz
Source-Drain Diode					
*I _S	-	-	172	A	
*I _{SM}	-	-	999		
*V _{SD}	-	0.74	1.2	V	I _S =20A, V _{GS} =0V
*t _{rr}	-	45.9	-	ns	I _F =20A, V _{GS} =0V, dI _F /dt=100A/μs
*Q _{rr}	-	55.7	-	nC	

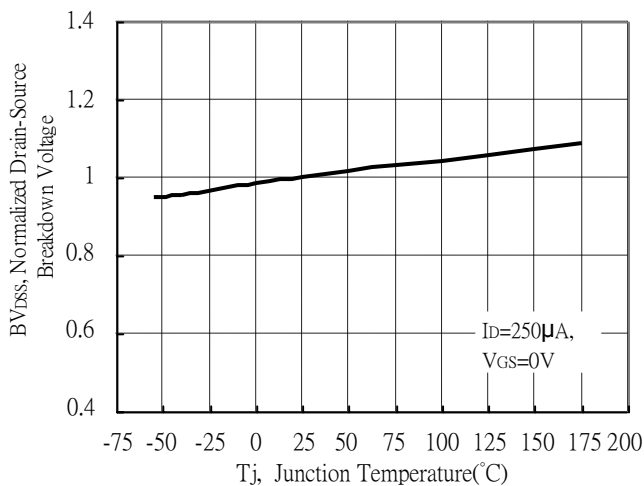
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

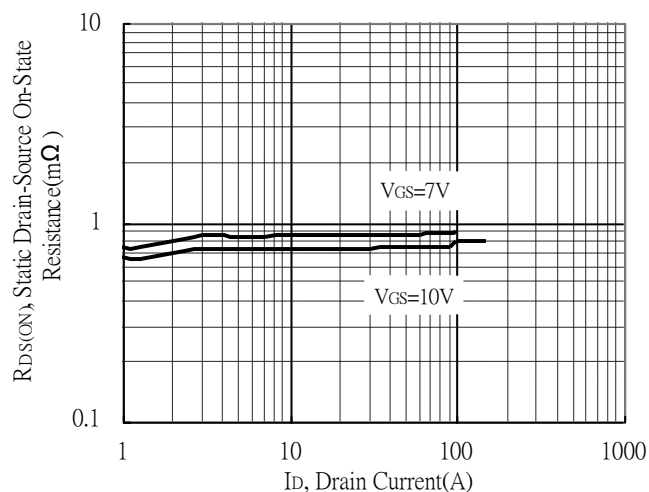
Typical Output Characteristics



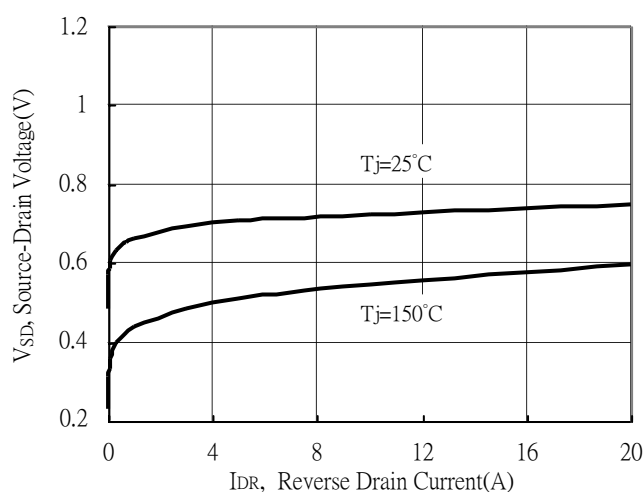
Breakdown Voltage vs Ambient Temperature



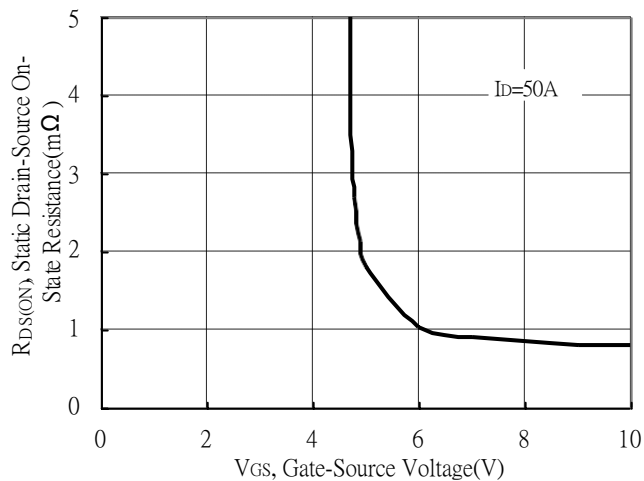
Static Drain-Source On-State resistance vs Drain Current



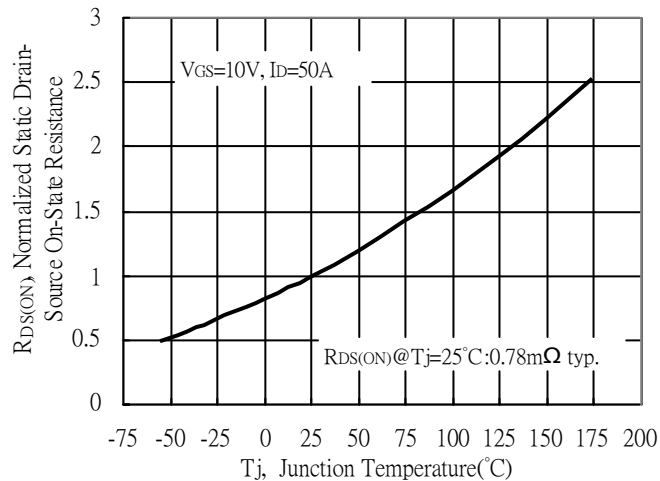
Reverse Drain Current vs Source-Drain Voltage



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

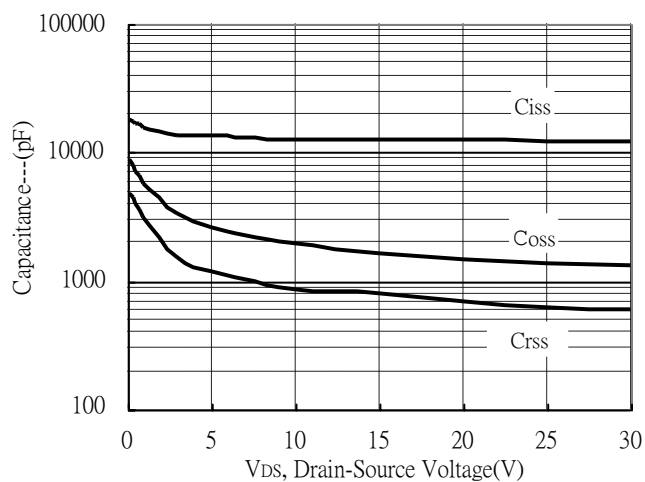


Drain-Source On-State Resistance vs Junction Temperature

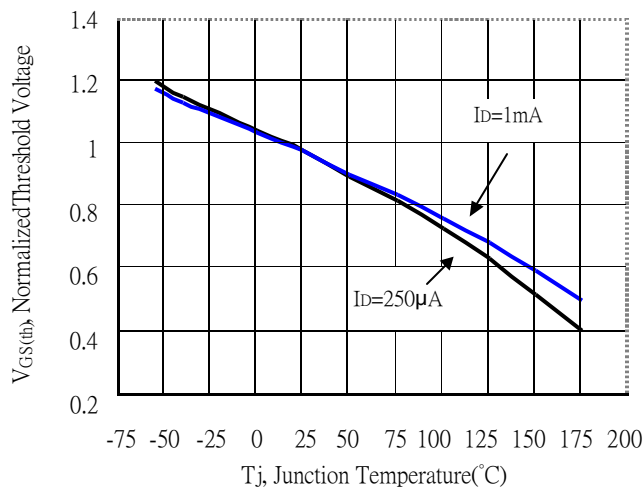


Typical Characteristics(Cont.)

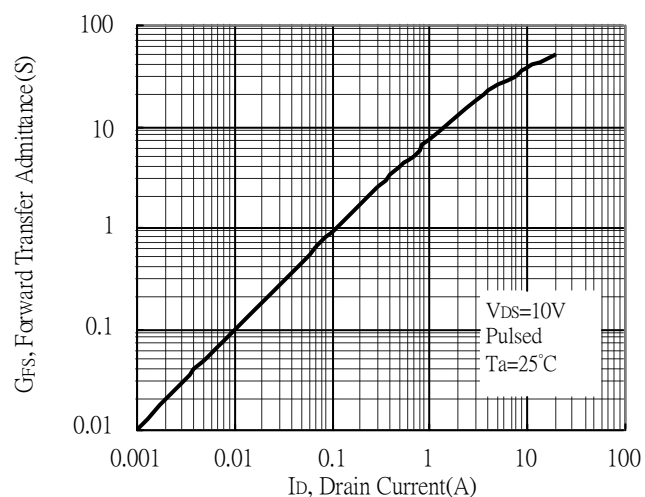
Capacitance vs Drain-to-Source Voltage



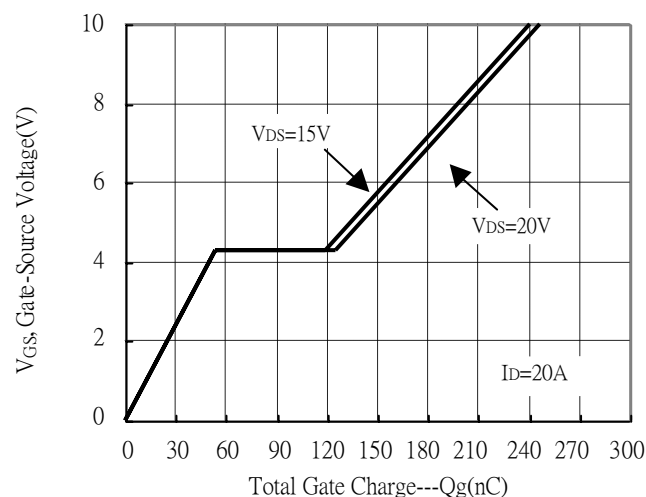
Threshold Voltage vs Junction Temperature



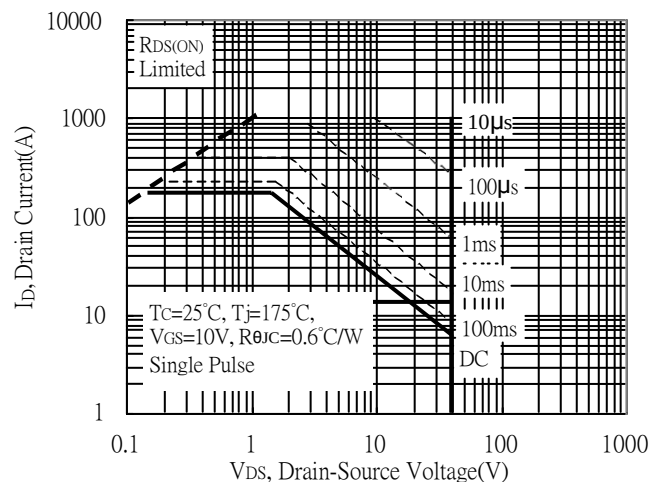
Forward Transfer Admittance vs Drain Current



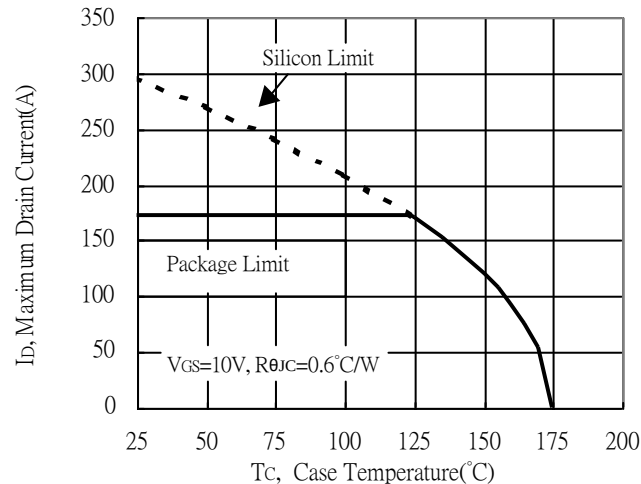
Gate Charge Characteristics



Maximum Safe Operating Area

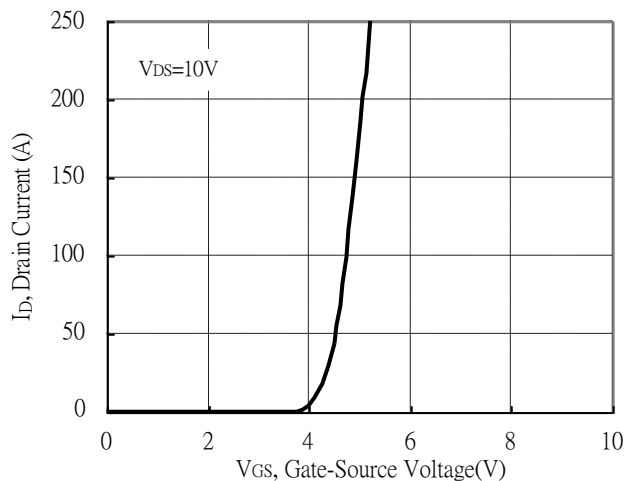


Maximum Drain Current vs Case Temperature

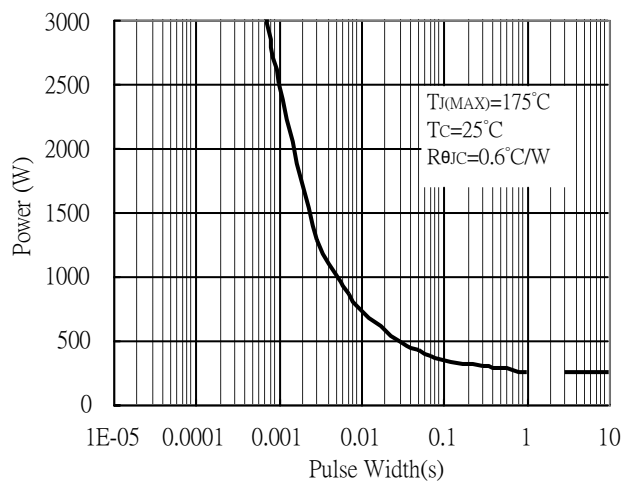


Typical Characteristics(Cont.)

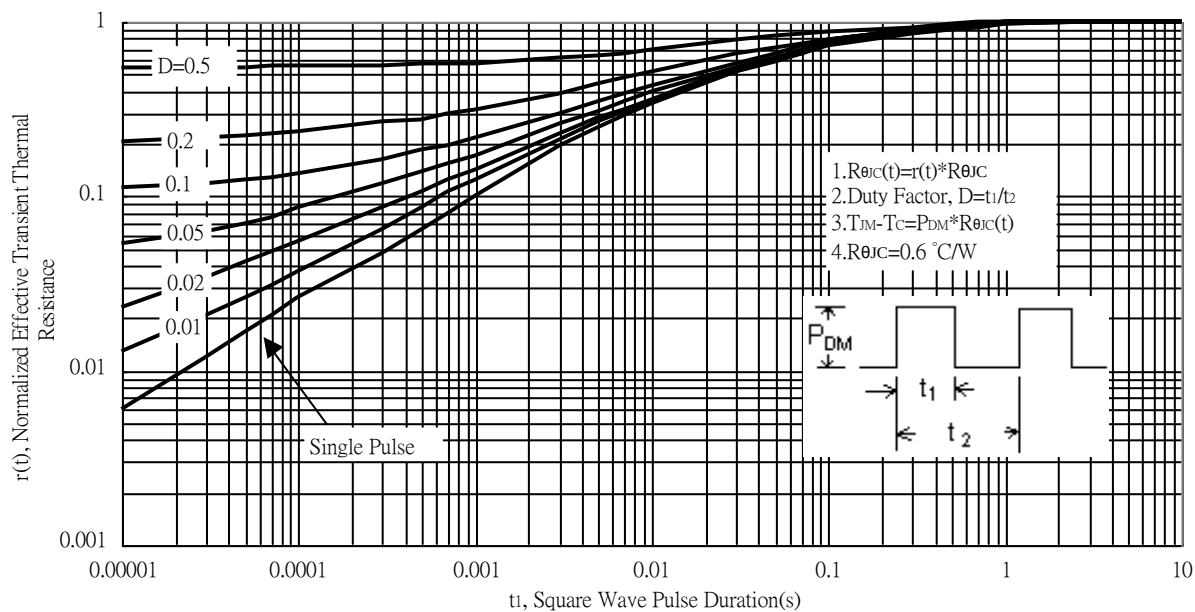
Typical Transfer Characteristics



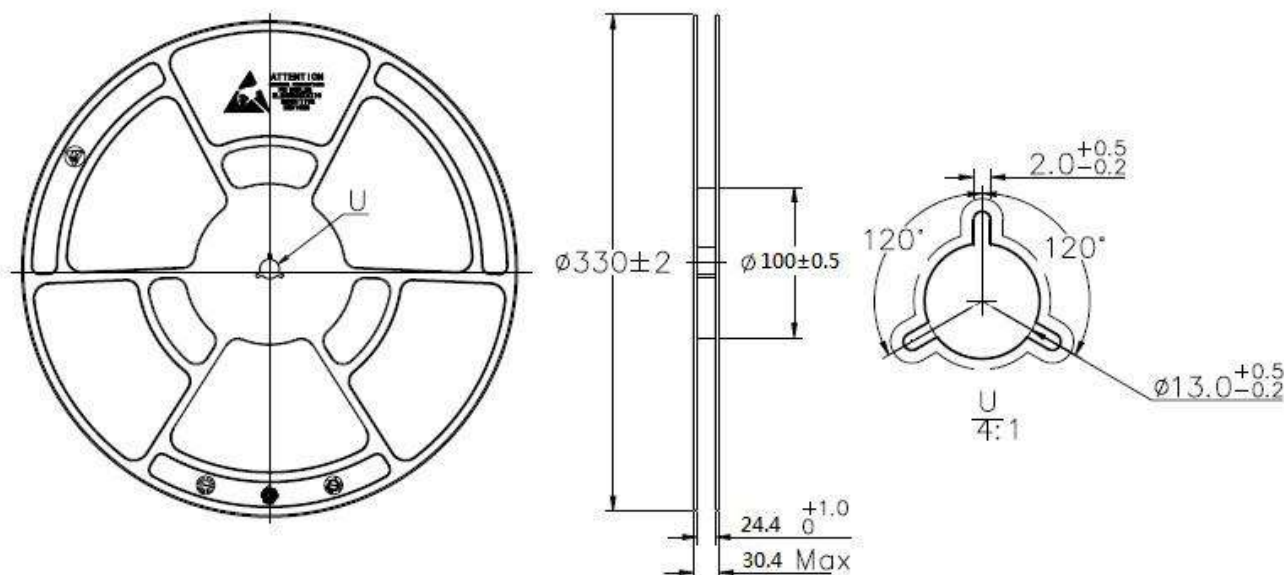
Single Pulse Maximum Power Dissipation



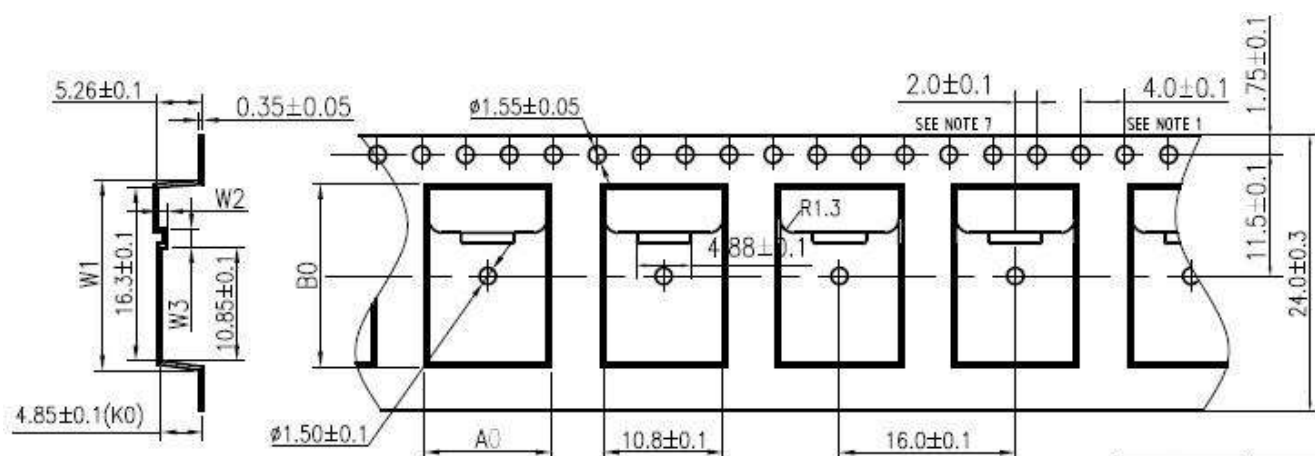
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension

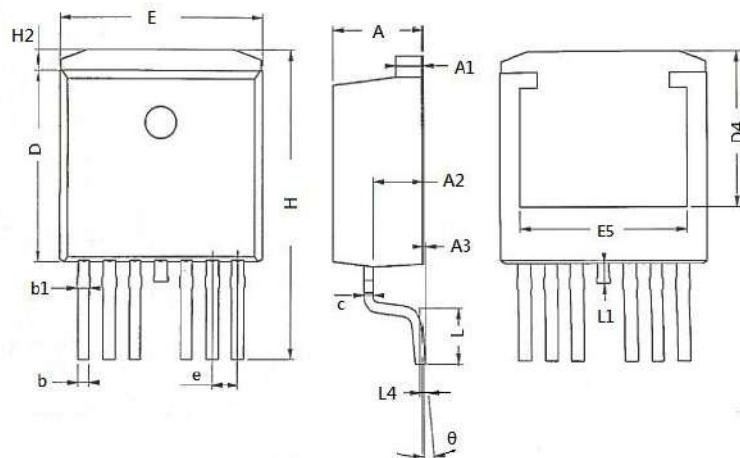


NOTES

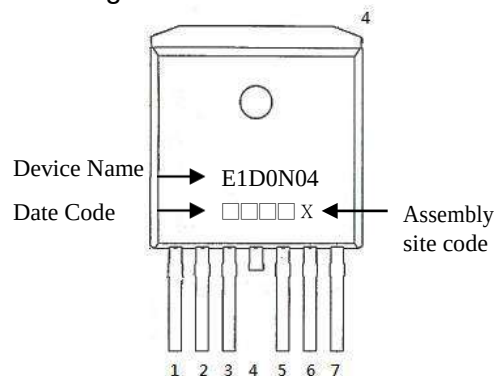
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ± 0.2 mm;
2. MATERIAL: BLACK CONDUCTIVE POLYSTYRENE;
3. DIMENSIONS ARE IN mm (UNLESS OTHERWISE SPECIFIED);
4. K0 MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE ON THE CARRIER;
5. A0 AND B0 MEASURED ON A PLANE 0.30 mm ABOVE THE BOTTOM OF THE POCKET;
6. SURFACE RESISTIVITY IS BETWEEN 1×10^6 TO 1×10^{10} OHMS/SQUARE;
7. Allowable Camber to be 1 mm/100 mm

Dim	Spec
opt 1	W1 16.9 ± 0.1
	W2 1.3 ± 0.1
	W3 1.0 ± 0.1
opt 2	W1 17.2 ± 0.1
	W2 1.8 ± 0.1
	W3 0.85 ± 0.1

TO-263-7L-4C Dimension



Marking :



7-Lead Plastic Surface Mounted TO-263-7L Package

Style : Pin 1. Gate
 Pin 2, 3, 5, 6, 7 : Source
 Pin 4. Drain

Date Code : (From left to right)

First Code : Year code, the last digit of Christnr year. For example, 2014→4, 2015→5, 2016→6, ..., etc.

Second 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

Third and fourth codes : production serial number, 01~99

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1673	0.1791	4.25	4.55	E	0.3858	0.4016	9.80	10.20
A1	0.0472	0.0551	1.20	1.40	e	0.0500	BSC	1.27	BSC
A2	0.0886	0.1004	2.25	2.55	E5	0.2854	-	7.25	-
A3	0.0004	0.0098	0.01	0.25	H	0.5768	0.6043	14.65	15.35
b	0.0197	0.0276	0.50	0.70	H2	0.0315	0.0472	0.80	1.20
b1	0.0228	0.0331	0.58	0.84	L	0.0945	0.1181	2.40	3.00
c	0.0157	0.0236	0.40	0.60	L1	0.0335	0.0453	0.85	1.15
D	0.3563	0.3720	9.05	9.45	L4	0.0098	BSC	0.25	BSC
D4	0.2717	-	6.90	-	θ	2°	8°	2°	8°