

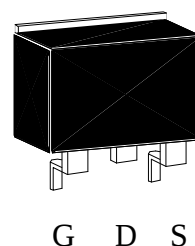
P-Channel Enhancement Mode Power MOSFET

Features:

- Low Gate Charge
- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching Characteristic
- RoHS compliant package

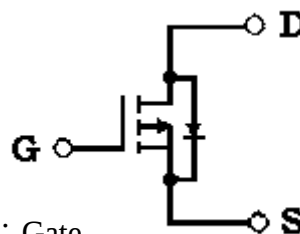
Outline

TO-263



Symbol

KWB110P10



G : Gate
D : Drain
S : Source

BV_{DSS}	-100V
$I_D @ V_{GS}=-10V$	-23A
$R_{DS(on)(TYP)} @ V_{GS}=-10V, I_D=-11A$	80m Ω
$R_{DS(on)(TYP)} @ V_{GS}=-4.5V, I_D=-8A$	93m Ω

Ordering Information

Device	Package	Shipping
KWB110P10	TO-263 (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}	-100	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ T _C =25°C, V _{GS} =-10V	I _D	-23	A
Continuous Drain Current @ T _C =100°C, V _{GS} =-10V		-16	
Pulsed Drain Current (Note 3)	I _{DM}	-76	
Continuous Drain Current @ T _A =25°C, V _{GS} =10V (Note 2)	I _{DSM}	-3.0	
Continuous Drain Current @ T _A =70°C, V _{GS} =10V (Note 2)		-2.4	
Avalanche Current (Note 3)	I _{AS}	-11	
Avalanche Energy @ L=7.1mH, I _D =-11A, R _G =25Ω (Note 2)	E _{AS}	430	mJ
Repetitive Avalanche Energy @ L=0.1mH (Note 3)	E _{AR}	14	
Power Dissipation	T _C =25°C (Note 1)	140	W
	T _C =100°C (Note 1)	70	
Power Dissipation	T _A =25°C (Note 2)	2	W
	T _A =70°C (Note 2)	1.3	
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 _{th,j-c}	1.1	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 1)		62	°C/W

- 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. Repetitive rating, 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. The static characteristics are obtained using <300μs pulses, duty cycle 0.5% maximum.
5. The R_{θJA} is the sum of thermal resistance from junction to case R_{θJC} and case to ambient.

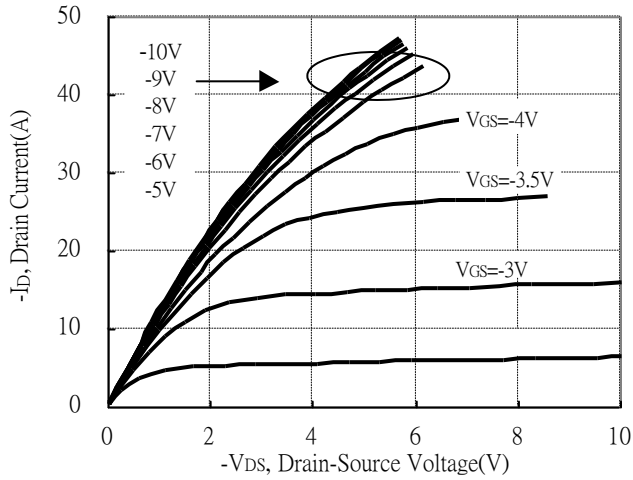
Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-100	-	-	V	V _{GS} =0V, I _D =-250μA
ΔBV _{DSS} /ΔT _j	-	-0.09	-	V/°C	Reference to 25°C, I _D =-250μA
V _{GS(th)}	-1.0	-	-2.5	V	V _{DS} = V _{GS} , I _D =-250μA
G _{FS}	-	19	-	S	V _{DS} =-10V, I _D =-11A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V
I _{DSS}	-	-	-1	μA	V _{DS} =-100V, V _{GS} =0V
	-	-	-25		V _{DS} =-80V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	80	110	mΩ	V _{GS} =-10V, I _D =-11A
	-	93	125		V _{GS} =-4.5V, I _D =-8A
Dynamic					
*Q _g	-	30.6	-	nC	I _D =-11A, V _{DS} =-80V, V _{GS} =-10V
*Q _{gs}	-	3.8	-		
*Q _{gd}	-	9.3	-		
*t _{d(ON)}	-	9.0	-	ns	V _{DS} =-50V, I _D =-11A, V _{GS} =-10V, R _G =5.1Ω
*t _r	-	18.2	-		
*t _{d(OFF)}	-	69.8	-		
*t _f	-	73.2	-		
C _{iss}	-	1726	-	pF	V _{GS} =0V, V _{DS} =-25V, f=1MHz
C _{oss}	-	104	-		
C _{rss}	-	71	-		
R _g	-	11	-	Ω	f=1MHz
Source-Drain Diode					
*I _S	-	-	-23	A	
*I _{SM}	-	-	-76		
*V _{SD}	-	-0.84	-1.3	V	I _S =-11A, V _{GS} =0V
*t _{rr}	-	25.3	-	ns	I _F =-11A, V _{GS} =0V, dI/dt=100A/μs
*Q _{rr}	-	33.4	-	nC	

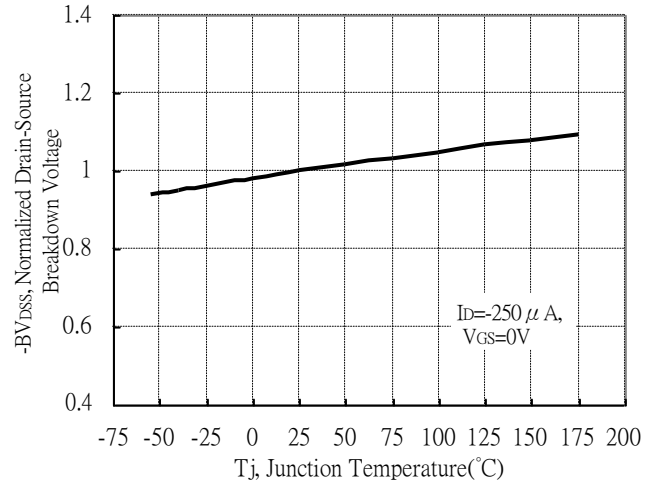
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

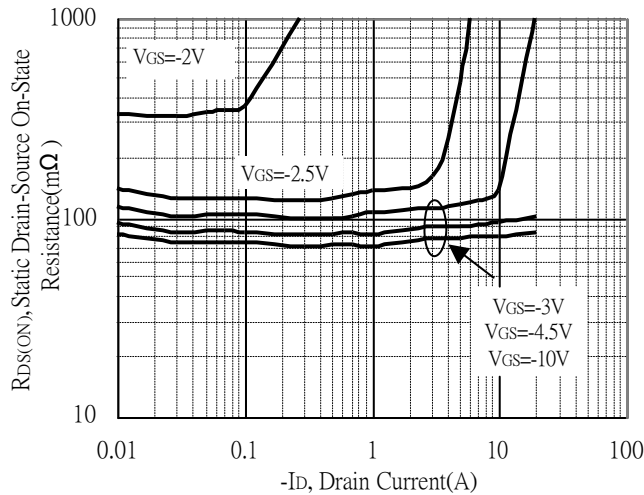
Typical Output Characteristics



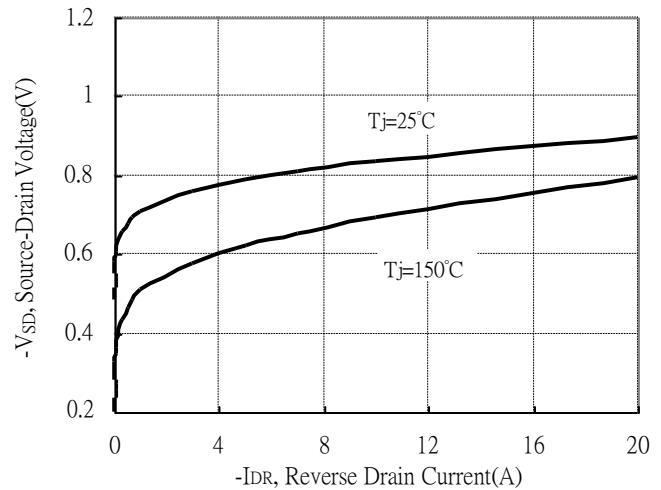
Breakdown Voltage vs Junction Temperature



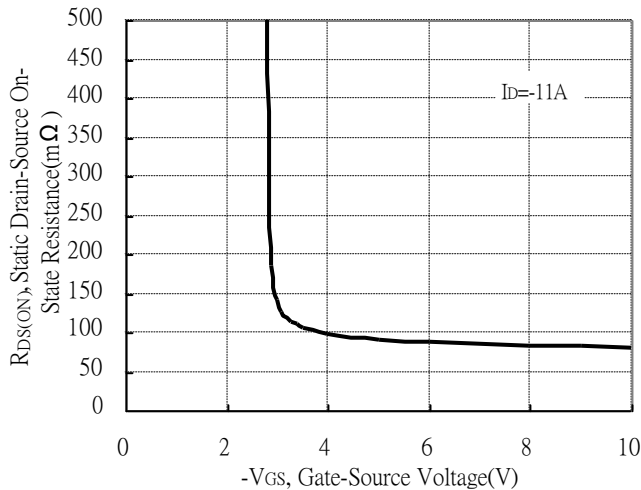
Static Drain-Source On-State resistance vs Drain Current



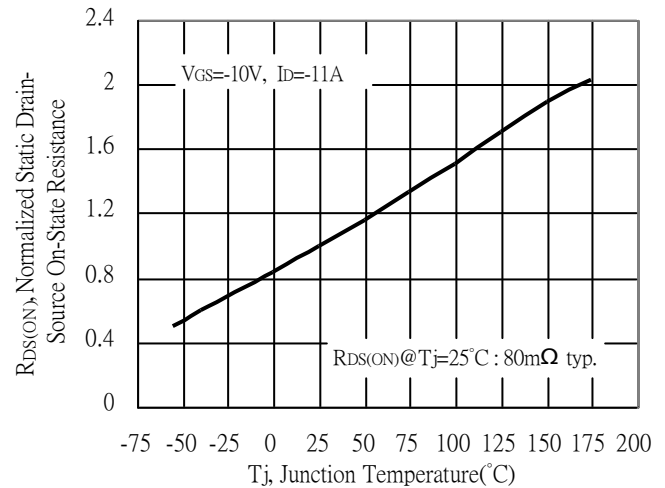
Reverse Drain Current vs Source-Drain Voltage



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

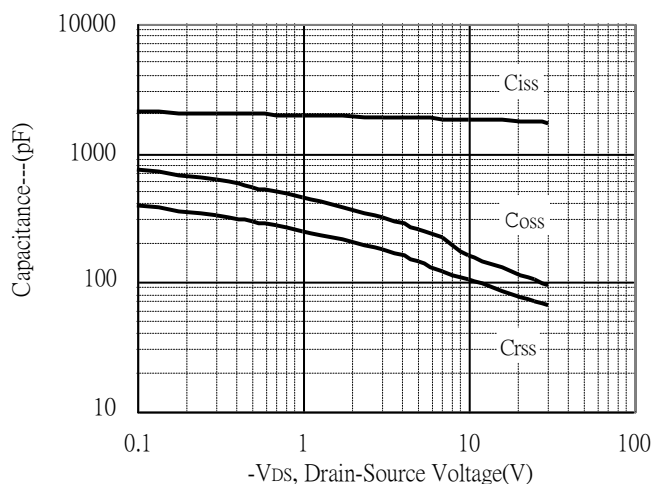


Drain-Source On-State Resistance vs Junction Temperature

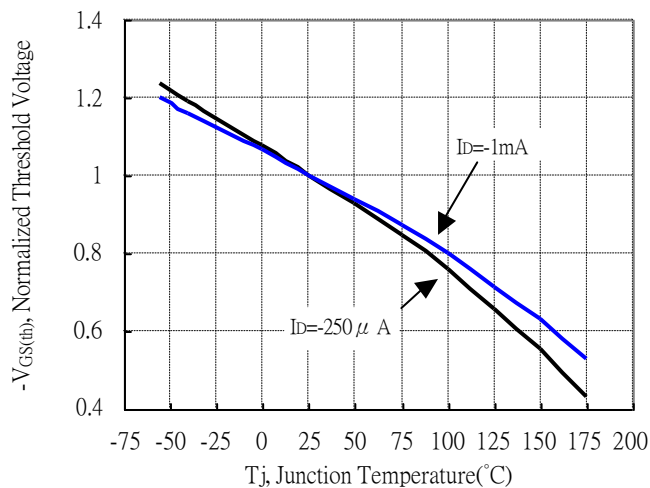


Typical Characteristics(Cont.)

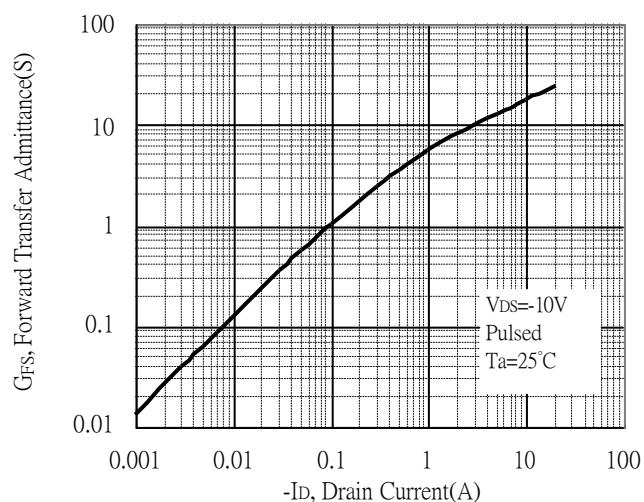
Capacitance vs Drain-to-Source Voltage



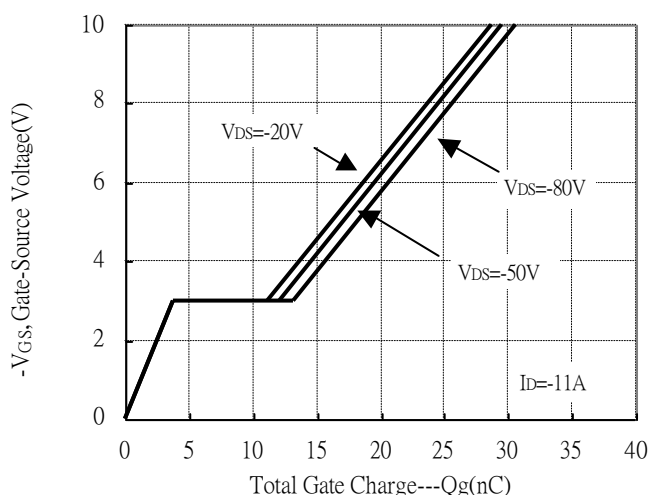
Threshold Voltage vs Junction Temperature



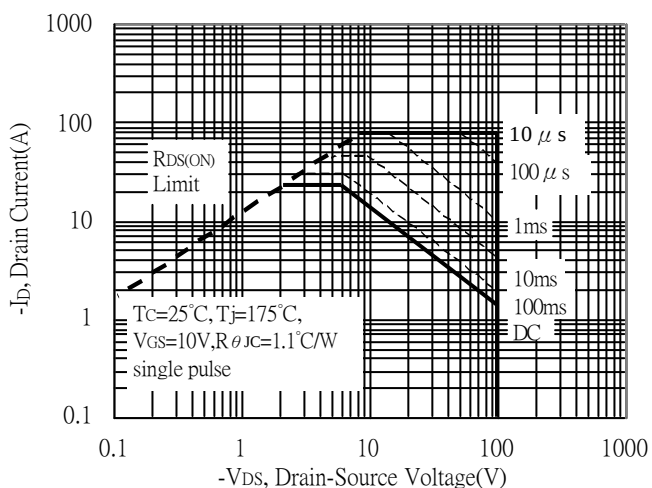
Forward Transfer Admittance vs Drain Current



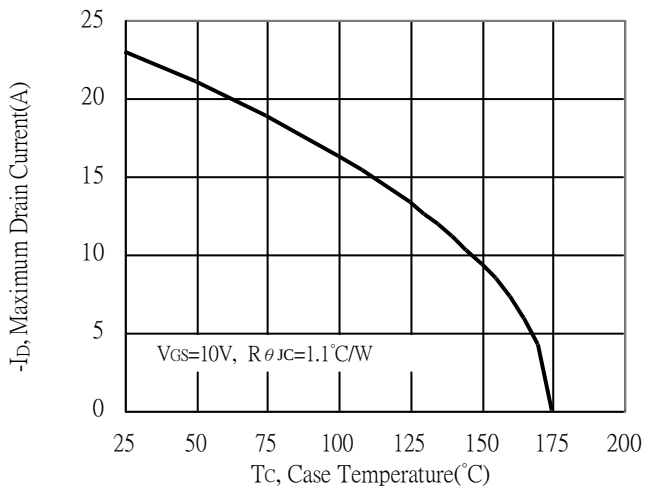
Gate Charge Characteristics



Maximum Safe Operating Area

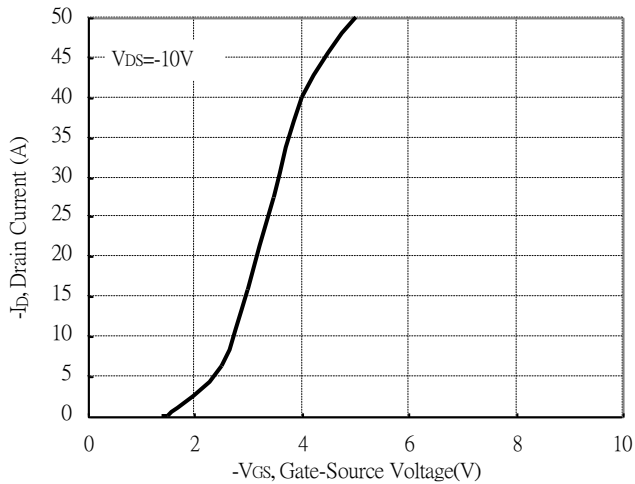


Maximum Drain Current vs Case Temperature

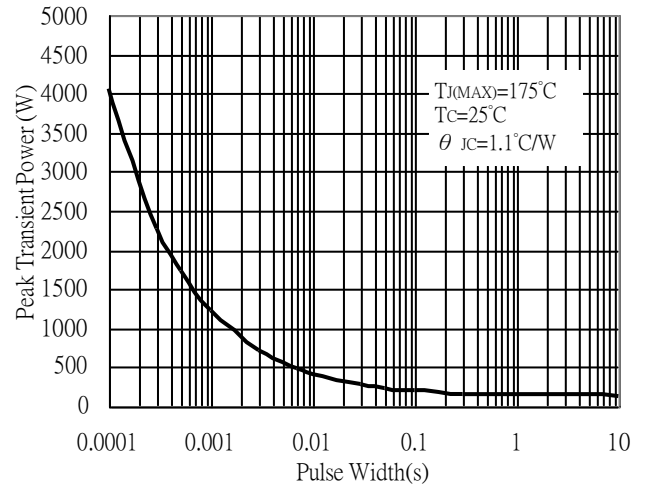


Typical Characteristics(Cont.)

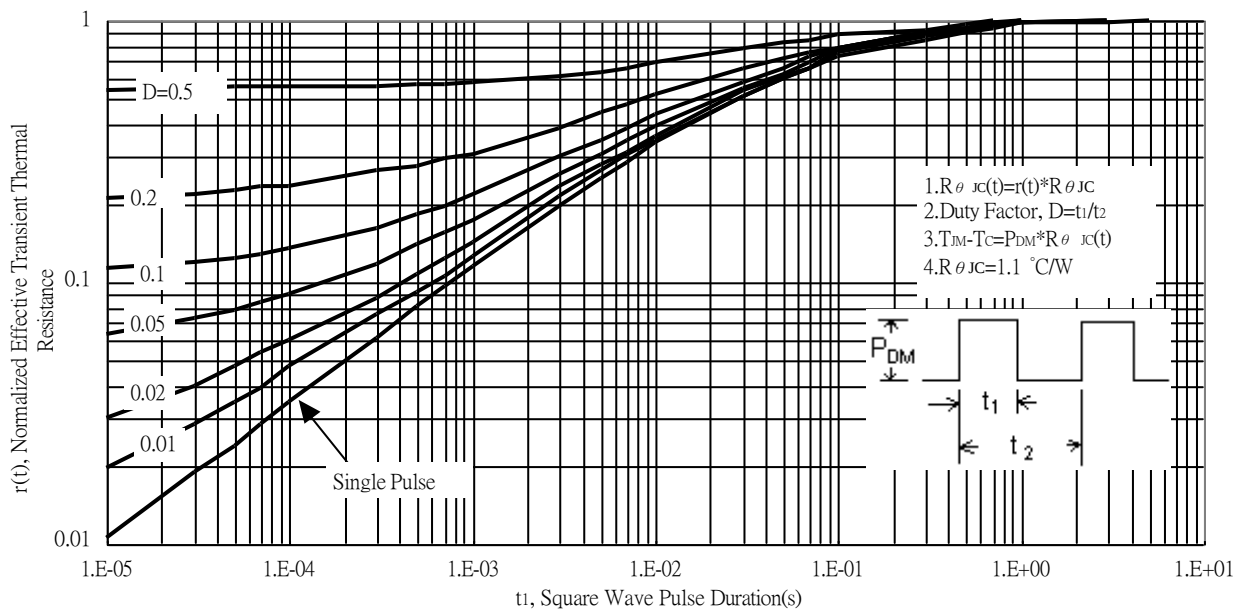
Typical Transfer Characteristics



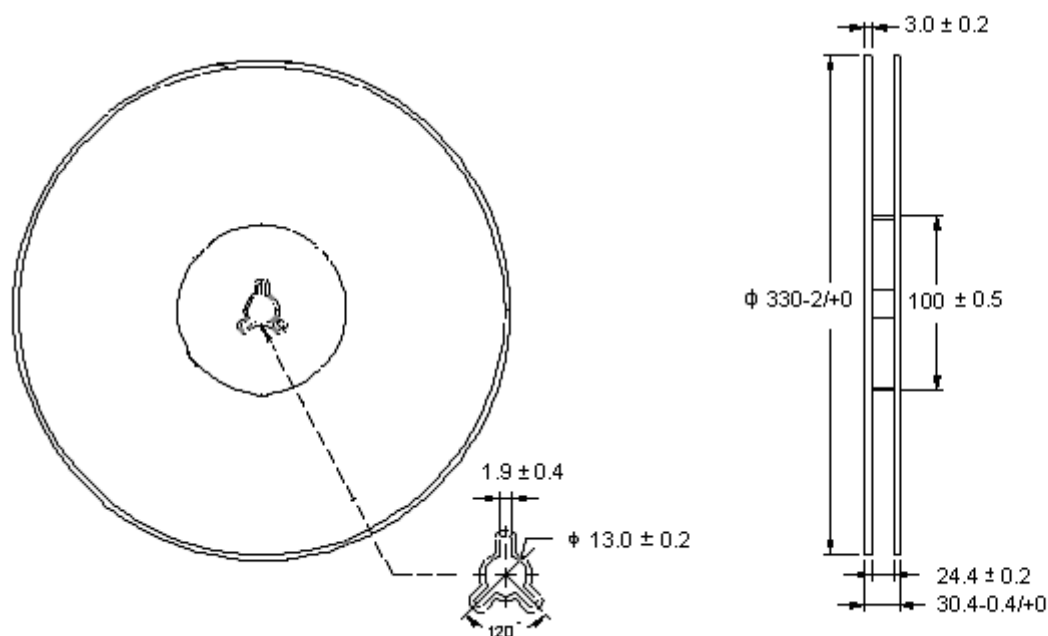
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves

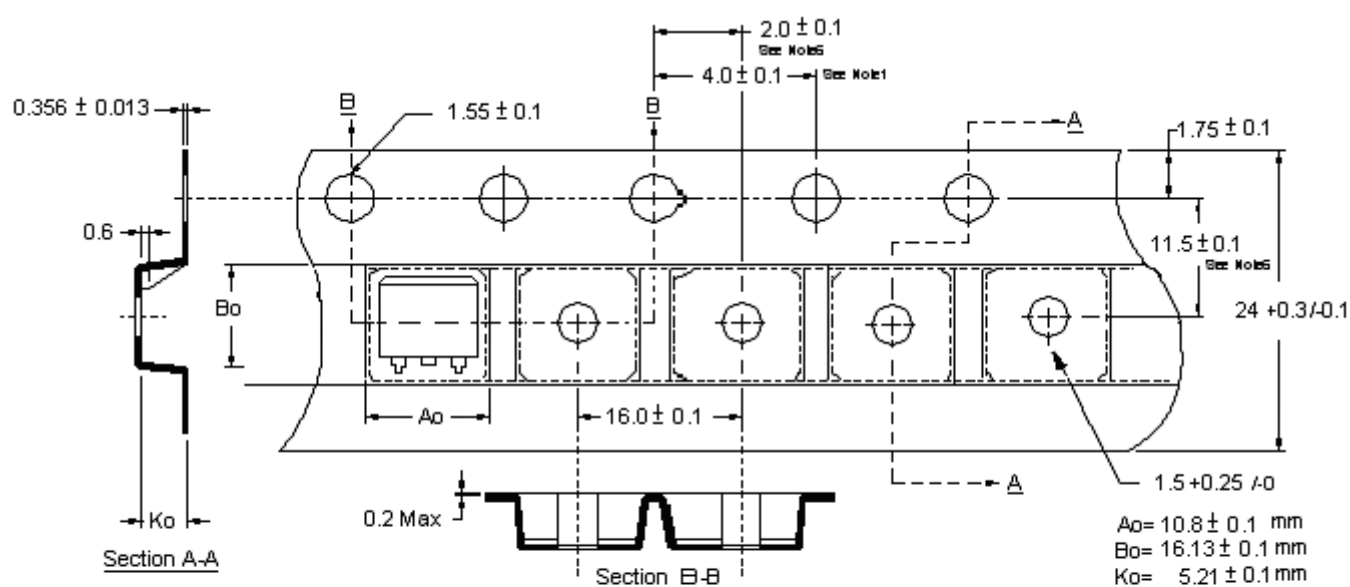


Reel Dimension



Unit: millimeter

Carrier Tape Dimension

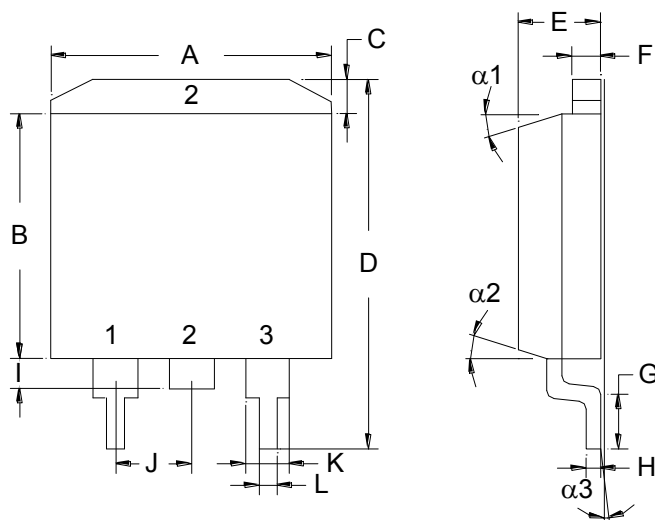


Notes

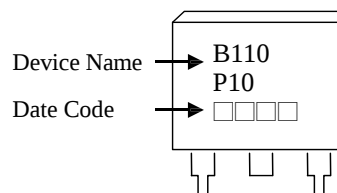
- Notes
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
 2. Camber not to exceed 1mm in 100mm.
 3. Material: Conductive Black Advantek Polystyrene.
 4. A_o & B_o measured on a plane 0.3mm above the bottom of the pocket.
 5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

TO-263 Dimension



Marking :



Style : Pin 1.Gate 2.Drain 3.Source

3-Lead Plastic Surface Mounted Package

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.3800	0.4050	9.65	10.29	I	0.0500	0.0700	1.27	1.78
B	0.3300	0.3700	8.38	9.40	J	-	*0.1000	-	*2.54
C	-	0.0550	-	1.40	K	0.0450	0.0550	1.14	1.40
D	0.5750	0.6250	14.61	15.88	L	0.0200	0.0390	0.51	0.99
E	0.1600	0.1900	4.06	4.83	α1	-	-	6°	8°
F	0.0450	0.0550	1.14	1.40	α2	-	-	6°	8°
G	0.0900	0.1100	2.29	2.79	α3	-	-	0°	5°
H	0.0180	0.0290	0.46	0.74					