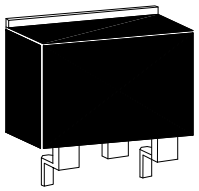
P-Channel Enhancement Mode Power MOSFET

Features:

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

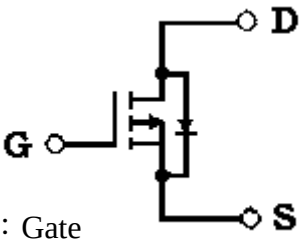
Outline

TO-263



G D S

Symbol



G：Gate
D：Drain
S：Source

BV_{DSS}	-100V
I_D @ V_{GS}=-10V, T_C=25°C	-44A
I_D @ V_{GS}=-10V, T_A=25°C	-4.6A
$R_{DSON(TYP)}$ @ V_{GS}=-10V, I_D=-20A	40mΩ

Ordering Information

Device	Package	Shipping
KWE050P10F3	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	-44	A
Continuous Drain Current @ T_C=100°C, V_{GS}=-10V			-31	
Pulsed Drain Current	(Note 3)	I_{DM}	-140	
Continuous Drain Current @ T_A=25°C , V_{GS}=10V	(Note 2)	I_{DSM}	-4.6	
Continuous Drain Current @ T_A=70°C , V_{GS}=10V	(Note 2)		-3.7	
Avalanche Current	(Note 4)	I_{AS}	-44	
Avalanche Energy @ L=1mH, I_D=-21A, V_{DD}=-25V	(Note 4)	E_{AS}	221	mJ
Repetitive Avalanche Energy@ L=0.1mH	(Note 3)	E_{AR}	20	
Power Dissipation	T_C=25°C (Note 1)	P_D	200	W
	T_C=100°C (Note 1)		100	
Power Dissipation	T_A=25°C (Note 2)	P_{DSM}	2	
	T_A=70°C (Note 2)		1.3	
Operating Junction and Storage Temperature		Tj, Tstg	-55~+175	°C

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max		$R_{th,j-c}$	0.75	°C/W
Thermal Resistance, Junction-to-ambient, max	(Note 2)	$R_{th,j-a}$	62	

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 $R_{\theta JA}$ 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 $R_{\theta JA}$ 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}=-18A, V_{GS}=-10V, V_{DD}=-25V.

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

6. The $R_{\theta JA}$ is the sum of thermal resistance from junction to case $R_{\theta JC}$ and case to ambient.

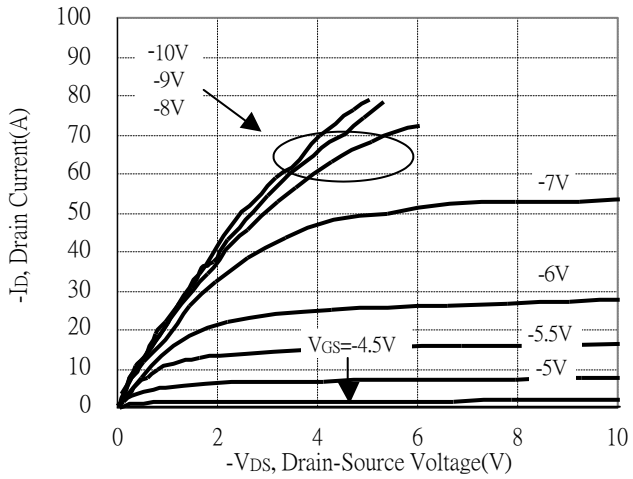
Characteristics (T_C=25°C, unless otherwise specified)

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}	-	23	-	S	V_{DS} =-10V, I_D=-20A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V
I_{DSS}	-	-	-1	μA	V_{DS} =-80V, V_{GS} =0V
	-	-	-25		V_{DS} =-80V, V_{GS} =0V, Tj=125°C
*$R_{DS(ON)}$	-	40	50	mΩ	V_{GS} =-10V, I_D=-20A
Dynamic					
*Qg	-	33.5	-	nC	I_D=-21A, V_{DS}=-50V, V_{GS}=-10V
*Qgs	-	7.6	-		
*Qgd	-	11.5	-		
*$t_{d(ON)}$	-	20.6	-	ns	V_{DS}=-20V, I_D=-1A, V_{GS}=-10V, R_G=6Ω
*tr	-	18	-		
*$t_{d(OFF)}$	-	73.2	-		
*t_f	-	64.2	-		
Ciss	-	1895	-	pF	V_{GS}=0V, V_{DS}=-25V, f=1MHz
Coss	-	207	-		
Crss	-	94	-		
Rg	-	4.7	-	Ω	f=1MHz
Source-Drain Diode					
*I_S	-	-	-44	A	
*I_{SM}	-	-	-140		
*V_{SD}	-	-0.85	-1.2	V	I_S=-20A, V_{GS}=0V
*trr	-	30	-	ns	I_F=-20A, V_{GS}=0V, dI_F/dt=100A/μs
*Qrr	-	43	-	nC	

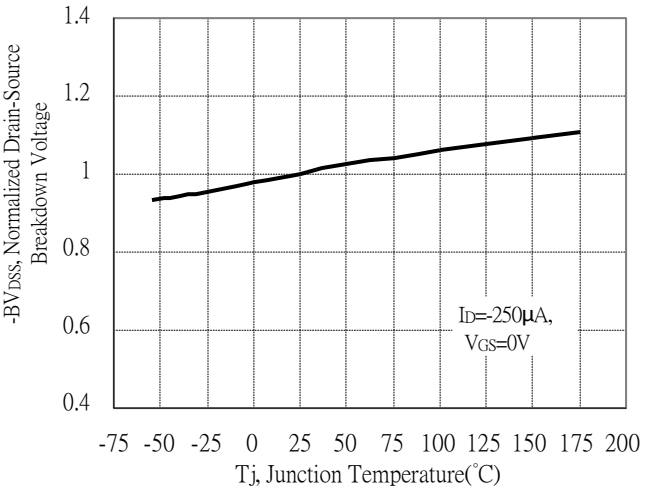
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

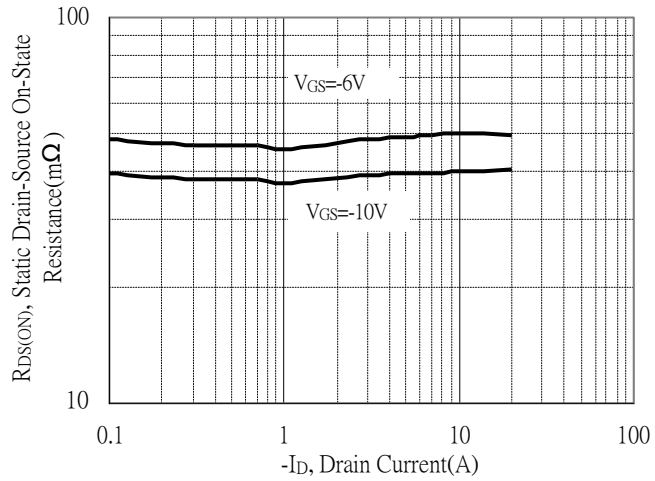
Typical Output Characteristics



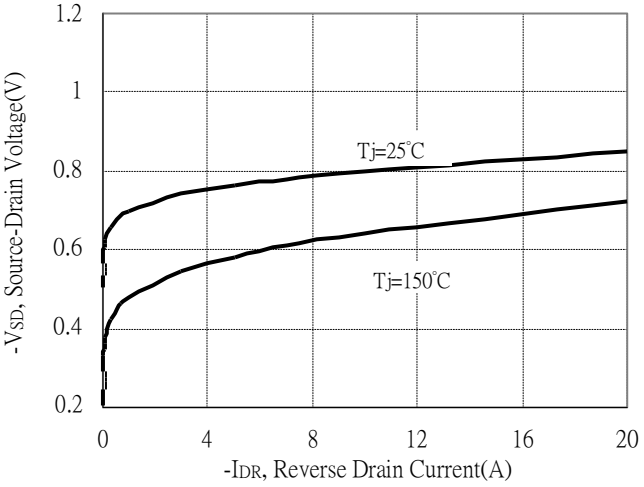
Brekdown Voltage vs Junction Temperature



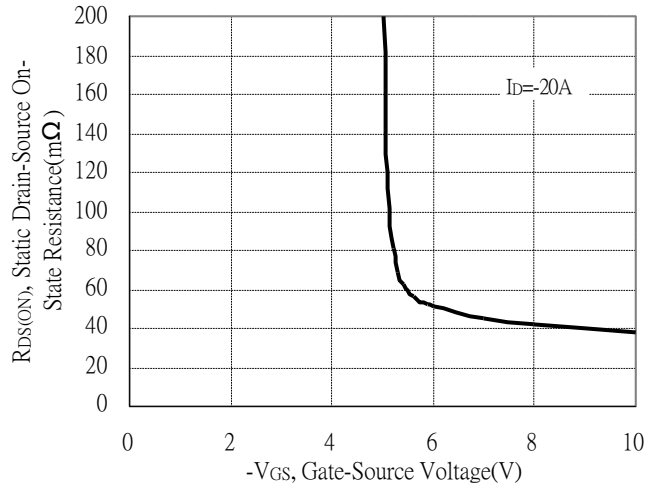
Static Drain-Source On-State resistance vs Drain Current



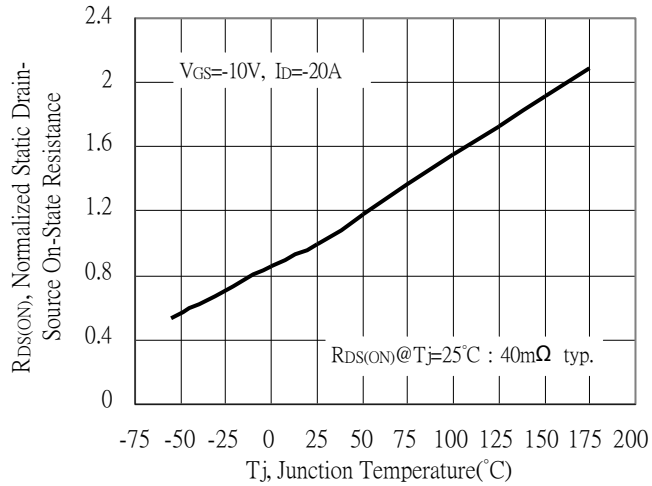
Reverse Drain Current vs Source-Drain Voltage



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

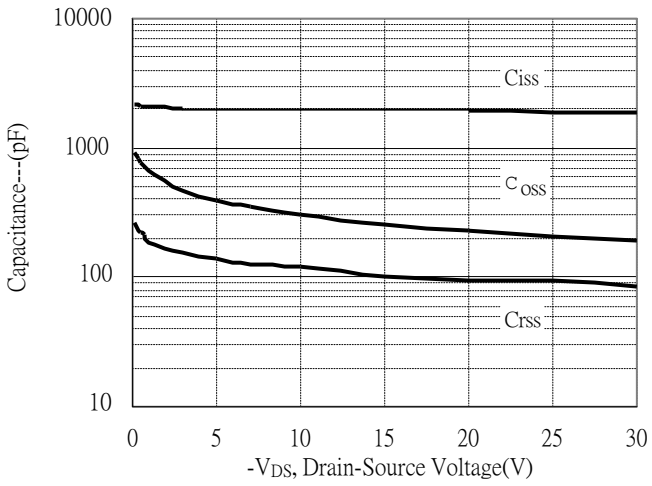


Drain-Source On-State Resistance vs Junction Tempearture

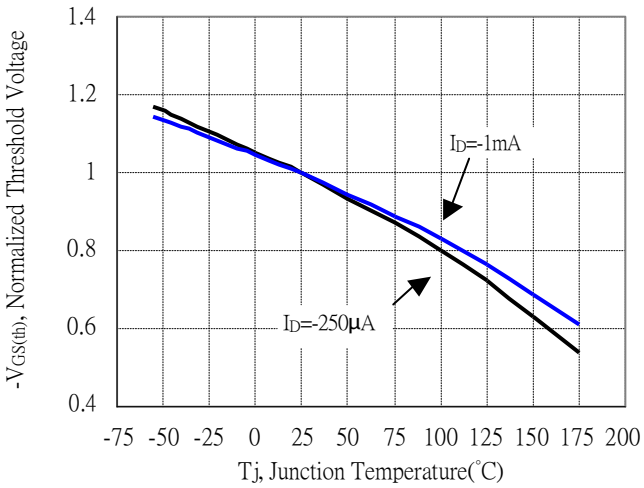


Typical Characteristics(Cont.)

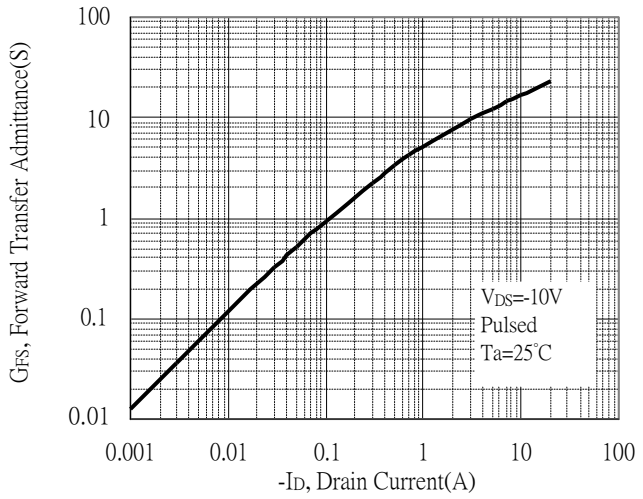
Capacitance vs Drain-to-Source Voltage



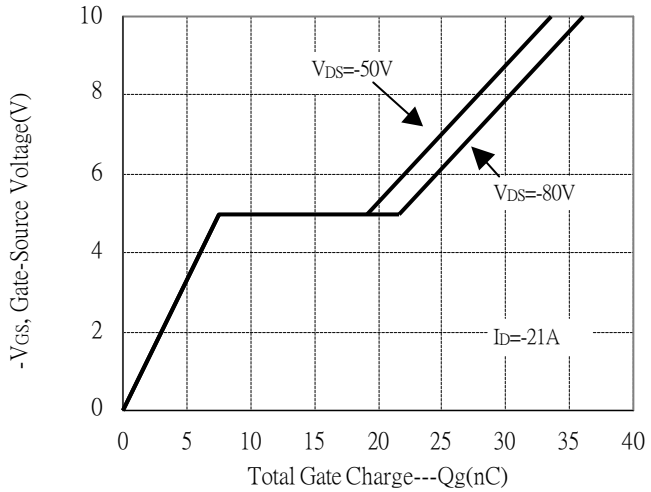
Threshold Voltage vs Junction Tempearture



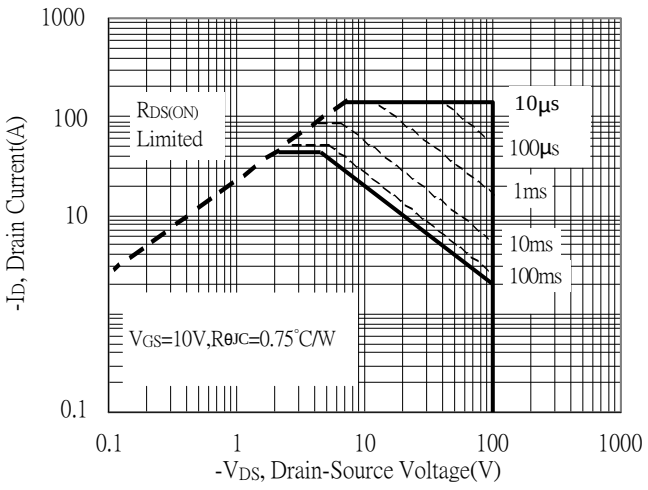
Forward Transfer Admittance vs Drain Current



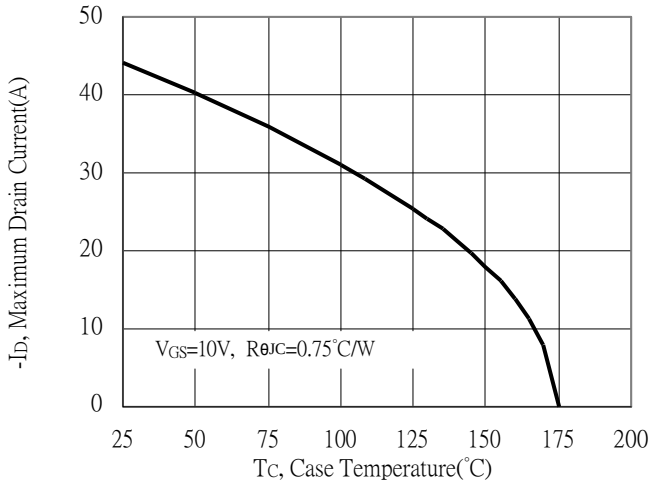
Gate Charge Characteristics



Maximum Safe Operating Area

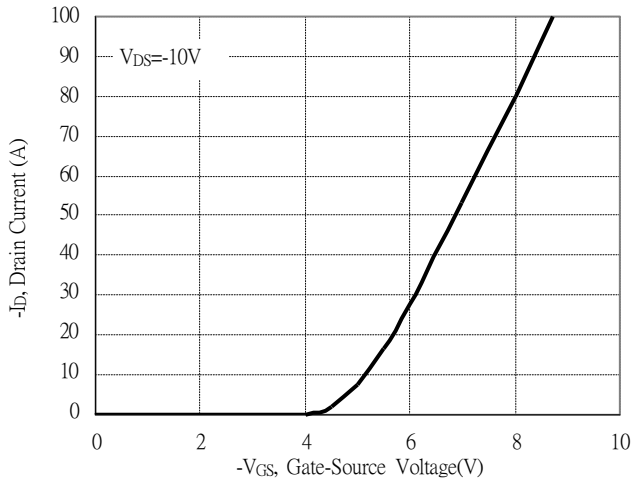


Maximum Drain Current vs Case Temperature

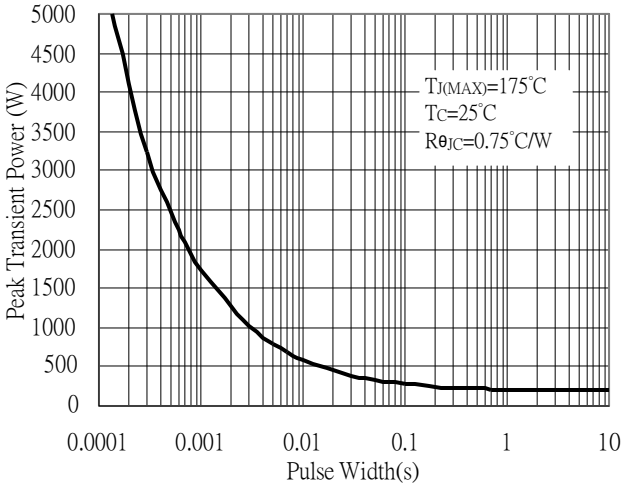


Typical Characteristics(Cont.)

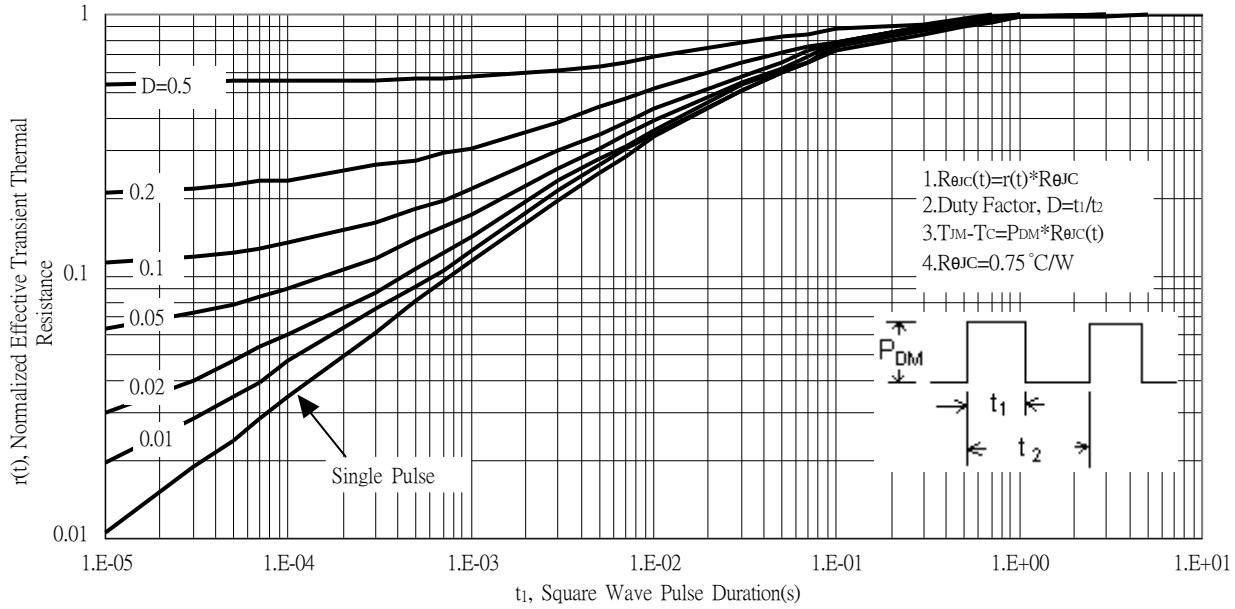
Typical Transfer Characteristics



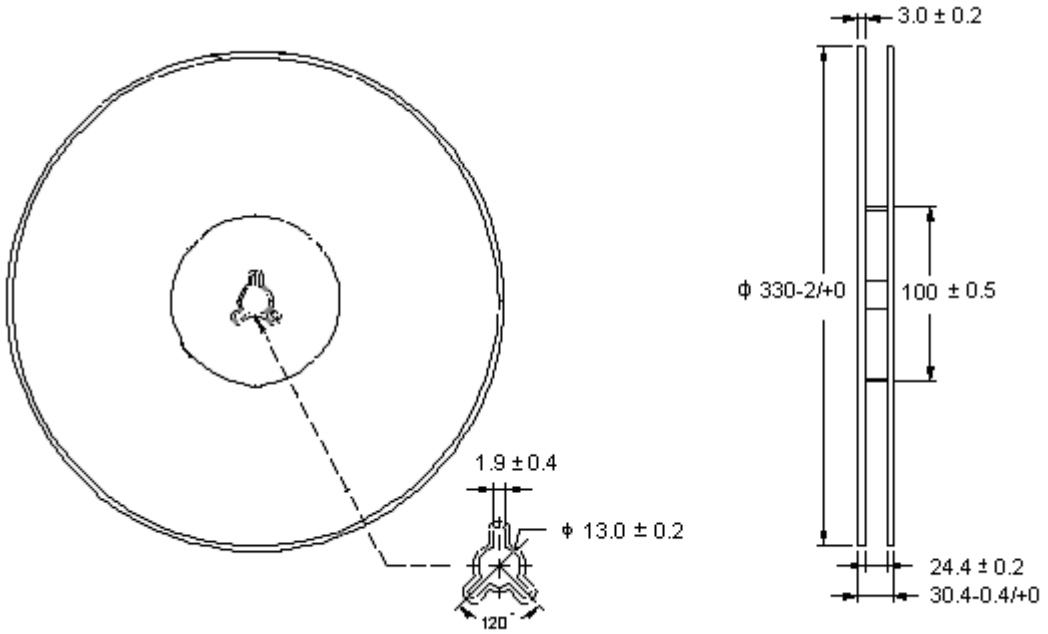
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves

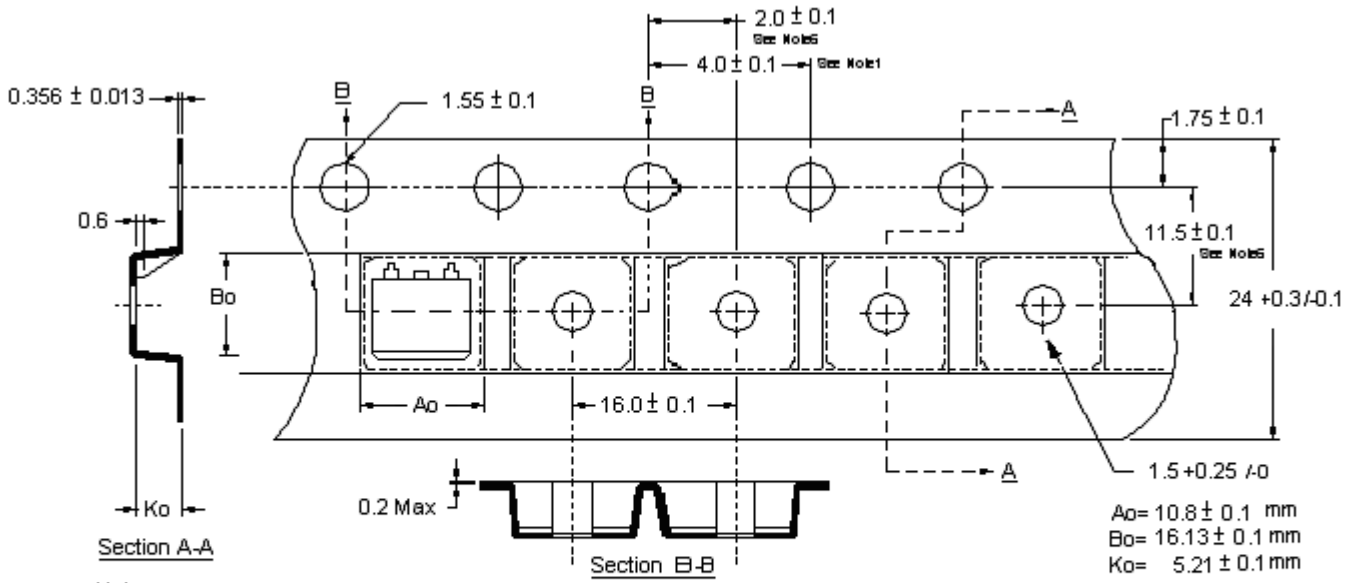


Reel Dimension



Unit: millimeter

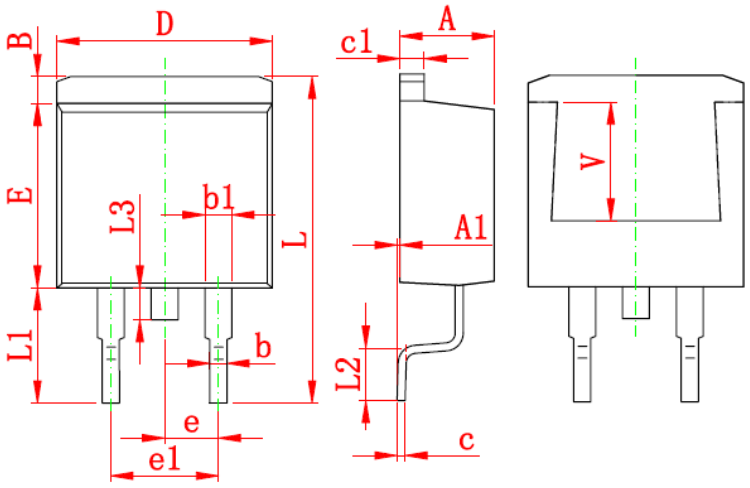
Carrier Tape Dimension



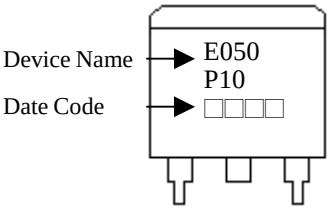
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of 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
Package Code : F3

*:Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184	E	8.500	8.900	0.335	0.350
A1	0.000	0.150	0.000	0.006	e	*2.540		*0.100	
B	1.170	1.370	0.046	0.054	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	L	15.050	15.450	0.593	0.608
b1	1.170	1.370	0.046	0.054	L1	5.080	5.480	0.200	0.216
c	0.310	0.530	0.012	0.021	L2	2.340	2.740	0.092	0.108
c1	1.170	1.370	0.046	0.054	L3	1.300	1.700	0.051	0.067
D	10.010	10.310	0.394	0.406	V	5.600 REF		0.220 REF	