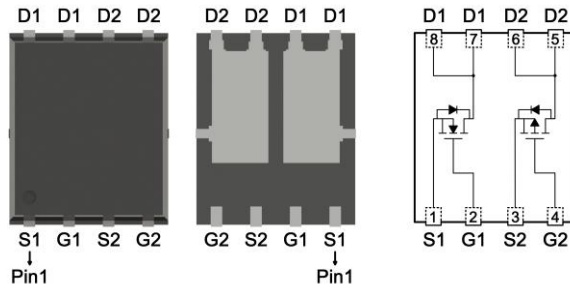


Product Summary

	N-CH	P-CH	
BV_{DSS}	30	-30	V
$R_{DS(ON)}$ typ. @ $V_{GS}=(-)10V$	14	24	mΩ
$R_{DS(ON)}$ typ. @ $V_{GS}=(-)4.5V$	19	35	
I_D @ $V_{GS}=(-)10V, T_C=25^\circ C$	9.5	-11	A
I_D @ $V_{GS}=(-)10V, T_A=25^\circ C$	8.5	-6.5	

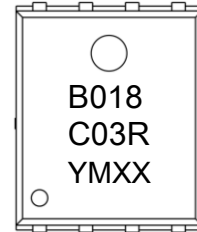
DFN5×6



Features

- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

Marking



← Device Code
← Date Code

YM: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99

Ordering Information

Device	Package	Shipping
MTB018C03RH8-0-T6-G	DFN5×6	3000pcs / Tape & Reel

0: Product rank, zero for no rank products.

T6: Packing spec, T6 : 3000pcs / tape & reel, 13" reel

G: Environment friendly grade: S for RoHS compliant products, G for RoHS compliant and green compound products.

Absolute Maximum Ratings ($T_A=25^\circ C$)

Parameter	Symbol	Value		Unit	
		N-CH	P-CH		
Drain-Source Voltage	V_{DS}	30	-30	V	
Gate-Source Voltage	V_{GS}	± 20	± 20		
Continuous Drain Current @ $V_{GS}=(-)10V, T_C=25^\circ C$ (silicon limit) *a	I_D	25	-23	A	
Continuous Drain Current @ $V_{GS}=(-)10V, T_C=25^\circ C$ (package limit) *a		9.5	-11		
Continuous Drain Current @ $V_{GS}=(-)10V, T_C=100^\circ C$ *a		9.5	-11		
Continuous Drain Current @ $V_{GS}=(-)10V, T_A=25^\circ C$ *b		8.5	-6.5		
Continuous Drain Current @ $V_{GS}=(-)10V, T_A=70^\circ C$ *b		6.8	-5.2		
Pulsed Drain Current *c	I_{DM}	38	-44		
Continuous Body Diode Forward Current @ $T_C=25^\circ C$	I_S	9.5	-11		
Pulsed Body Diode Forward Current @ $T_C=25^\circ C$	I_{SM}	38	-44		
Avalanche Current @ $L=0.1mH$	I_{AS}	5	-10		
Avalanche Energy @ $L=0.5mH$	E_{AS}	4	9	mJ	
Total Power Dissipation	P_D	$T_C=25^\circ C$ *a	21	29	W
		$T_C=100^\circ C$ *a	8.4	12	
		$T_A=25^\circ C$ *b	2.3	2.3	
		$T_A=70^\circ C$ *b	1.5	1.5	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150		$^\circ C$	
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JC}$	6	4.3	$^\circ C/W$	
Steady State Thermal Resistance, Junction-to-Ambient *b	$R_{\theta JA}$	55	55		

N-Channel Electrical Characteristics (T_A=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	-	2.5		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	4.2	-	S	V _{DS} =10V, I _D =5A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =24V, V _{GS} =0V
R _{DS(ON)}	-	14	18	mΩ	V _{GS} =10V, I _D =6A
	-	19	27		V _{GS} =4.5V, I _D =4A
Dynamic					
C _{iss}	-	270	-	pF	V _{DS} =15V, V _{GS} =0V, f=1MHz
C _{oss}	-	200	-		
C _{riss}	-	34	-		
R _g	-	0.4	-	Ω	f=1MHz
Q _g *d,e	-	3	-	nC	V _{DS} =15V, I _D =6A, V _{GS} =4.5V
Q _g *d,e	-	6	-		
Q _{gs} *d,e	-	1.2	-		
Q _{gd} *d,e	-	1.2	-		
t _{d(ON)} *d,e	-	4.6	-	ns	V _{DS} =15V, I _D =1A, V _{GS} =10V, R _{GS} =6Ω
t _r *d,e	-	17	-		
t _{d(OFF)} *d,e	-	14	-		
t _f *d,e	-	7.5	-		
Source-Drain Diode					
V _{SD} *d	-	0.85	1.2	V	I _S =6A, V _{GS} =0V
t _{rr}	-	11	-	ns	I _F =4A, di/dt=100A/μs
Q _{rr}	-	3	-	nC	

Note:

- *a. 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.
- *b. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on R_{θJA} and the maximum allowed junction temperature of 150°C. The value in any given application depends
- *c. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and low duty cycles to
- *d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- *e. Independent of operating temperature.

P-Channel Electrical Characteristics (T_A=25°C, unless otherwise specified)

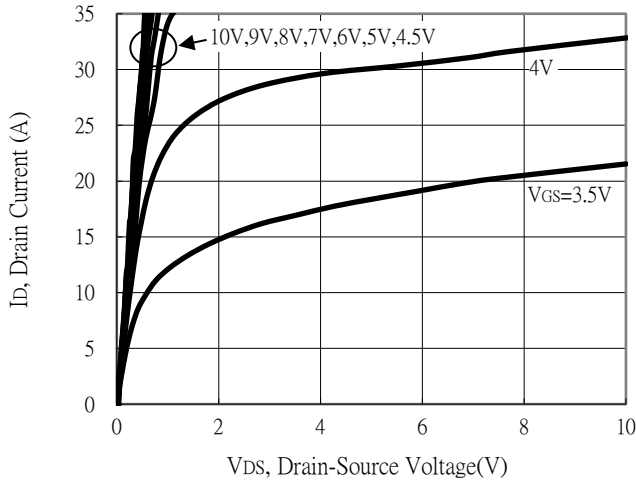
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-30	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-1.2	-	-2.5		V _{DS} =V _{GS} , I _D =-250μA
G _{FS}	-	19	-	S	V _{DS} =-10V, I _D =-10A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-24V, V _{GS} =0V
R _{DS(ON)}	-	24	31	mΩ	V _{GS} =-10V, I _D =-6A
	-	35	50		V _{GS} =-4.5V, I _D =-4A
Dynamic					
C _{iSS}	-	1000	-	pF	V _{DS} =-15V, V _{GS} =0V, f=1MHz
C _{oss}	-	120	-		
C _{rSS}	-	100	-		
R _g	-	14	-	Ω	f=1MHz
Q _g *d,e	-	10	-	nC	V _{DS} =-15V, I _D =-3A, V _{GS} =-4.5V
Q _g *d,e	-	21	-		
Q _{gs} *d,e	-	3.3	-		
Q _{gd} *d,e	-	4.1	-		
t _{d(ON)} *d,e	-	7.5	-	ns	V _{DS} =-15V, I _D =-3A, V _{GS} =-10V, R _{GS} =1Ω
t _r *d,e	-	18	-		
t _{d(OFF)} *d,e	-	55	-		
t _f *d,e	-	13	-		
Source-Drain Diode					
V _{SD} *d	-	-0.85	-1.2	V	I _S =-6A, V _{GS} =0V
t _{rr}	-	9.7	-	ns	I _F =-3A, di/dt=100A/μs
Q _{rr}	-	4.2	-	nC	

Note:

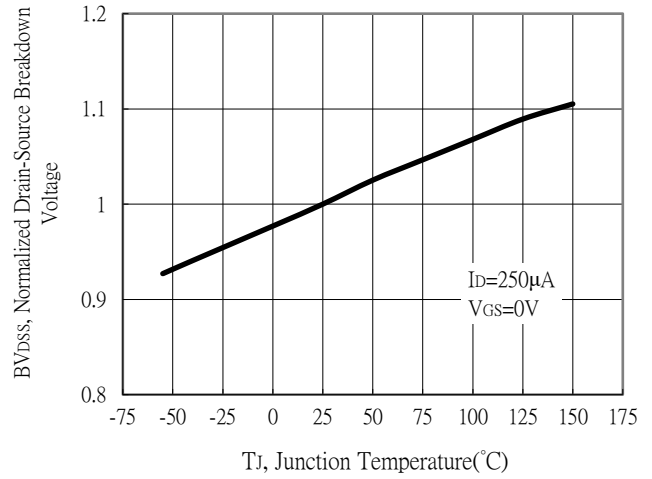
- *a. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.
- *b. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on R_{θJA} and the maximum allowed junction temperature of 150°C. The value in any given application depends
- *c. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and low duty cycles to
- *d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- *e. Independent of operating temperature.

N-Channel Typical Characteristics

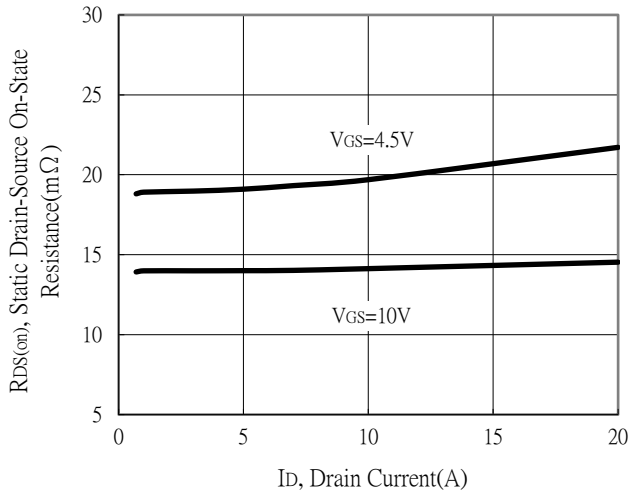
Typical Output Characteristics



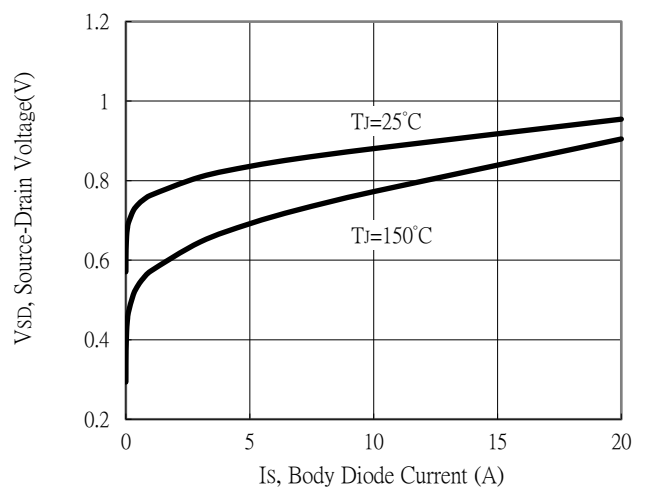
Breakdown Voltage vs Ambient Temperature



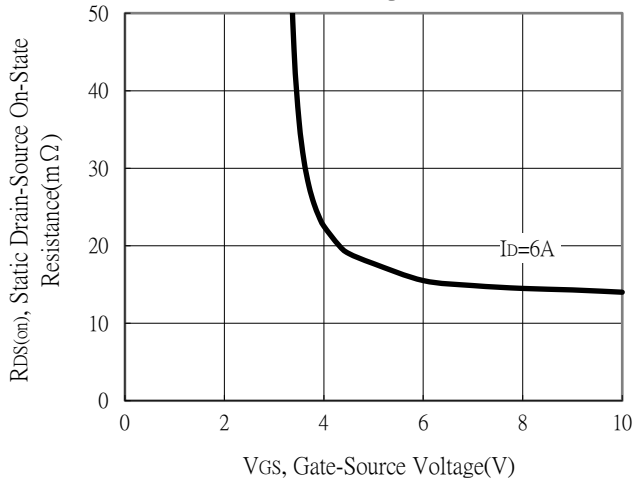
Static Drain-Source On-State resistance vs Drain Current



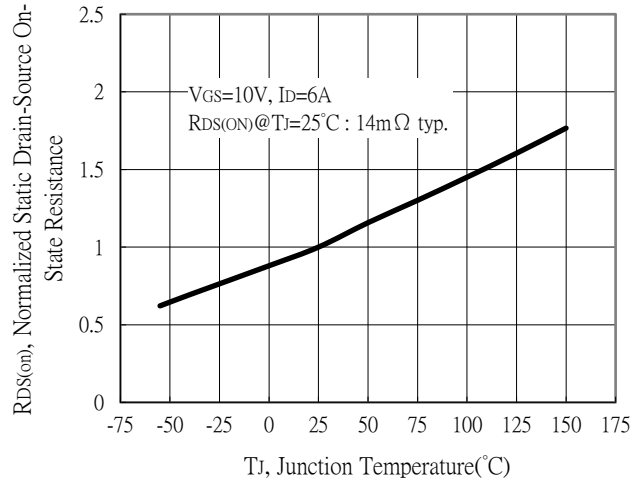
Body Diode Current vs Source-Drain Voltage



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

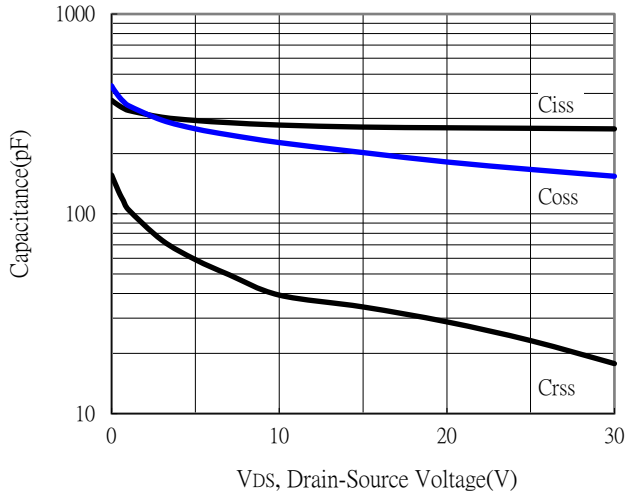


Drain-Source On-State Resistance vs Junction Temperature

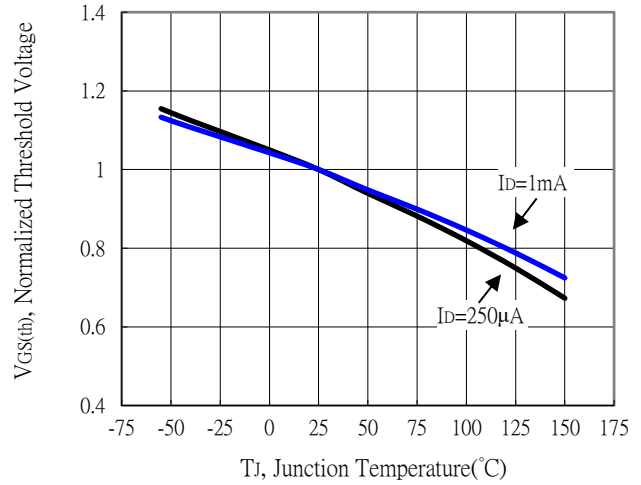


N-Channel Typical Characteristics

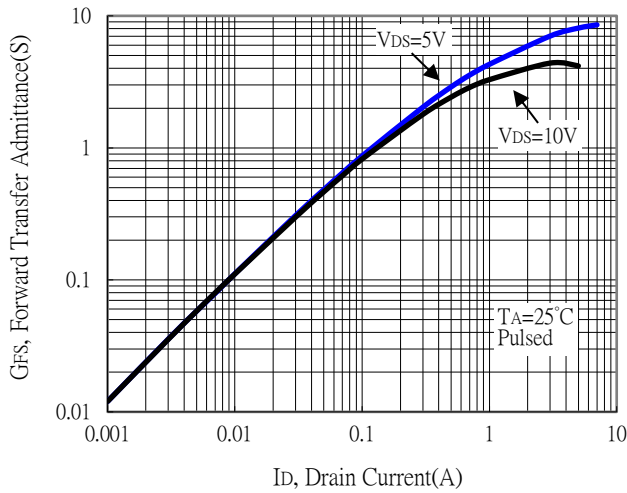
Capacitance vs Drain-to-Source Voltage



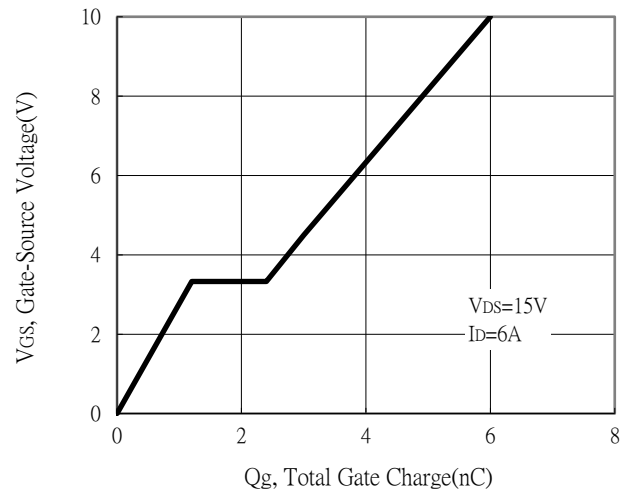
Threshold Voltage vs Junction Temperature



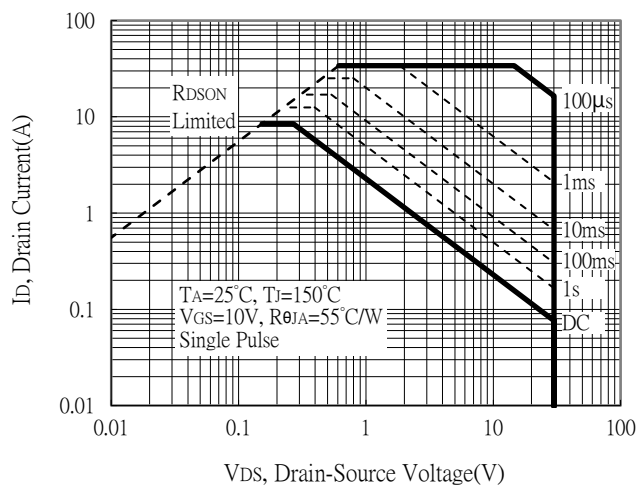
Forward Transfer Admittance vs Drain Current



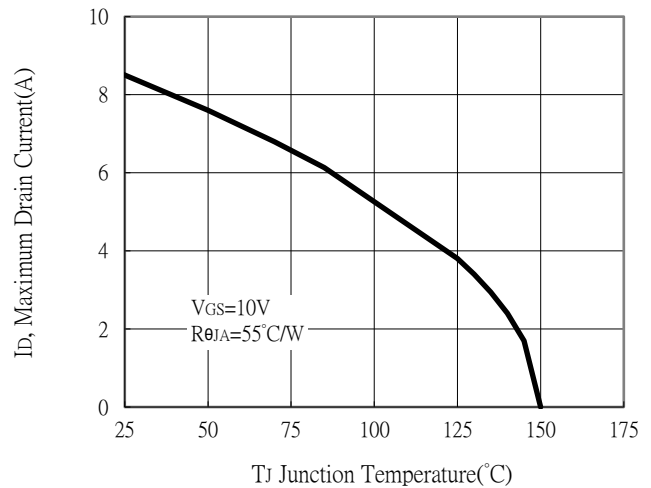
Gate Charge Characteristics



Maximum Safe Operating Area

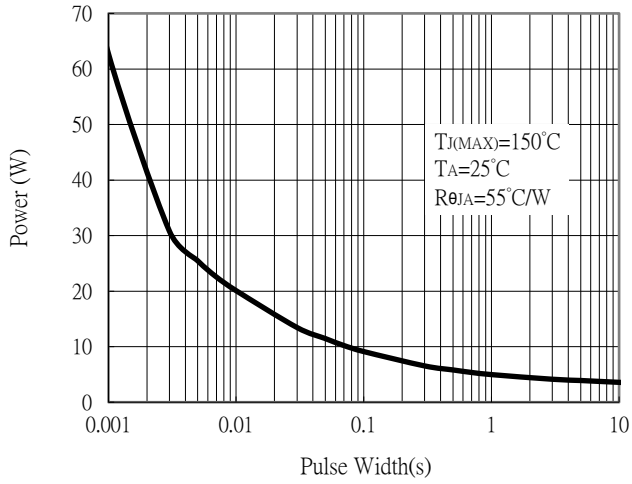


Maximum Drain Current vs Junction Temperature

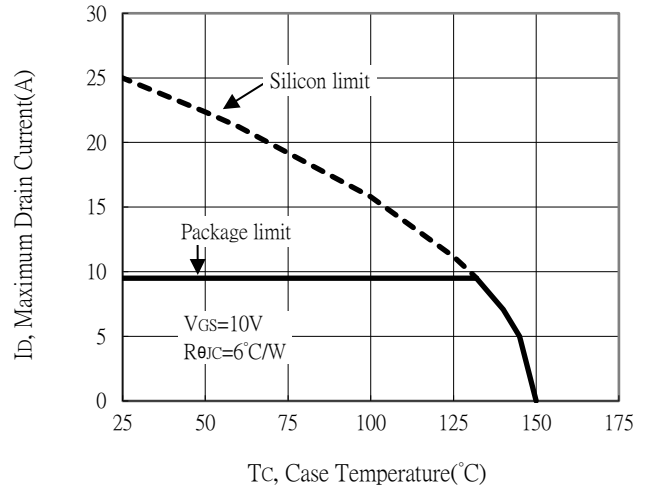


N-Channel Typical Characteristics

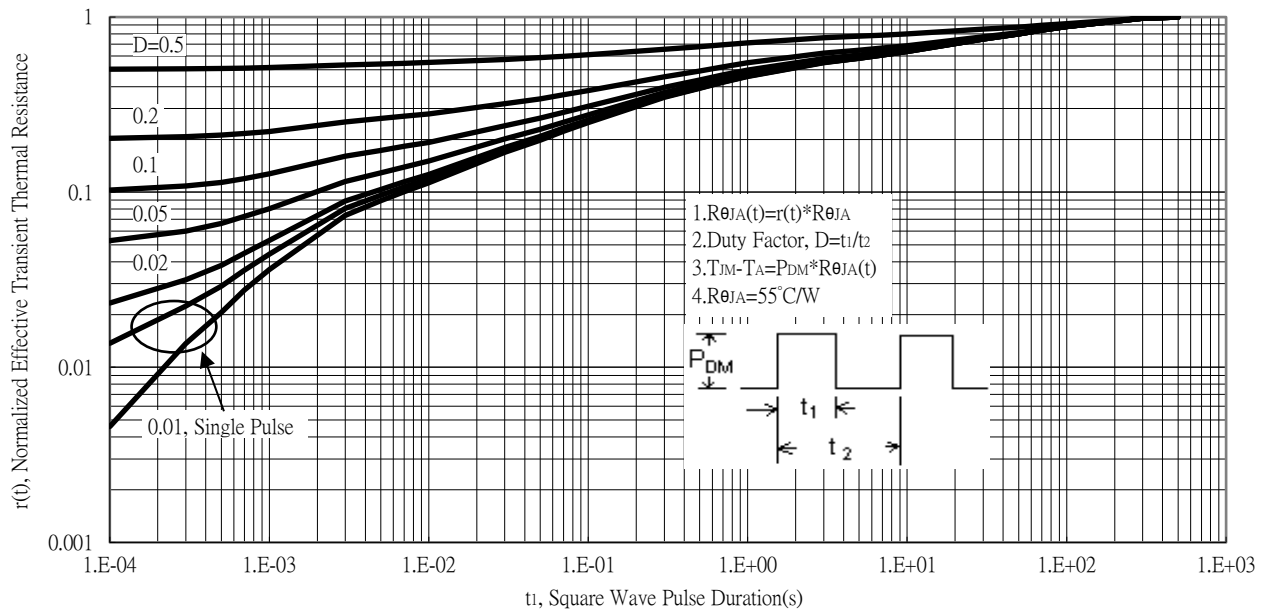
Single Pulse Power Rating, Junction to Ambient



Maximum Drain Current vs Case Temperature

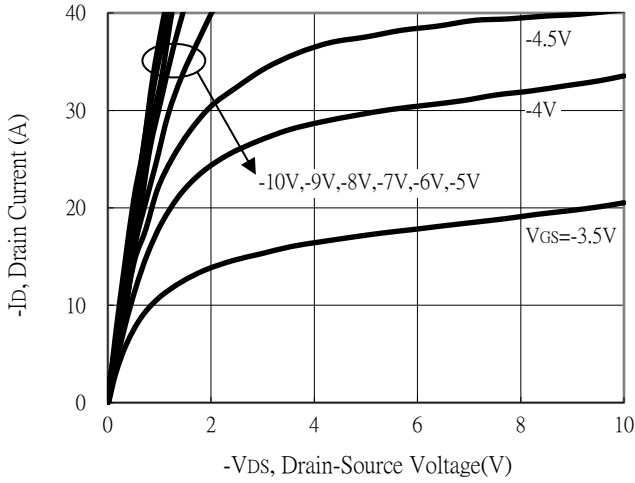


Transient Thermal Response Curves

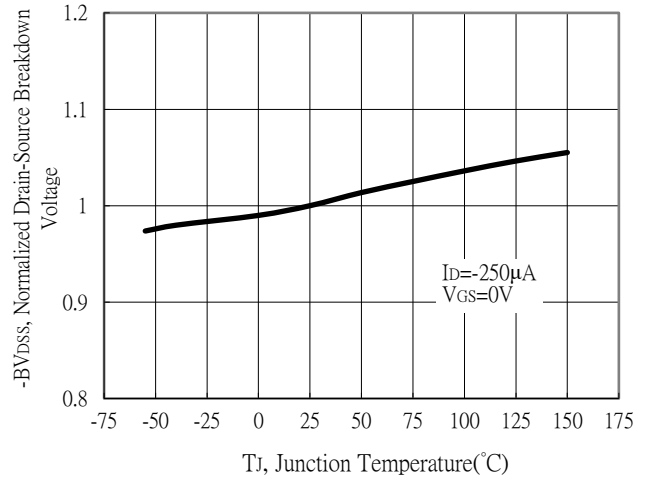


P-Channel Typical Characteristics

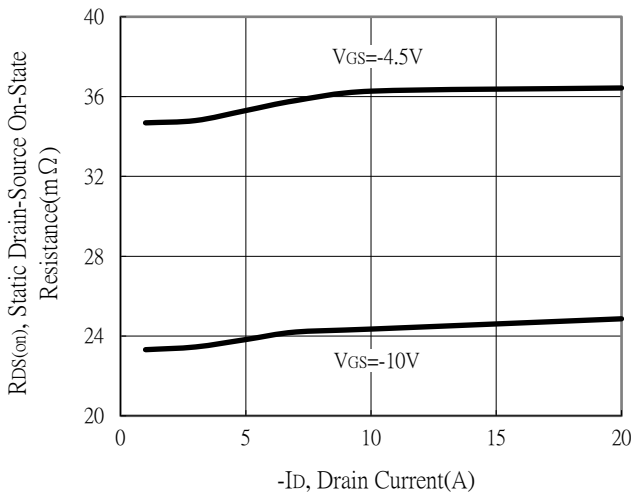
Typical Output Characteristics



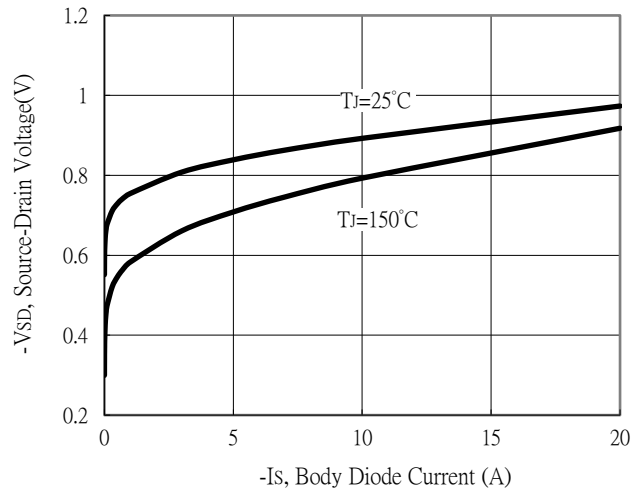
Breakdown Voltage vs Ambient Temperature



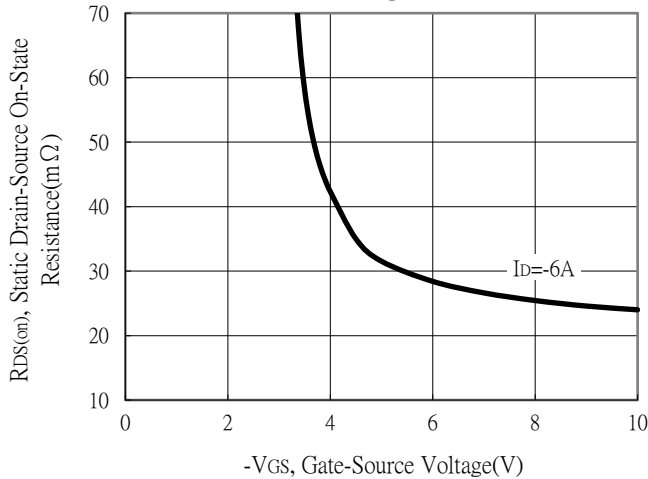
Static Drain-Source On-State resistance vs Drain Current



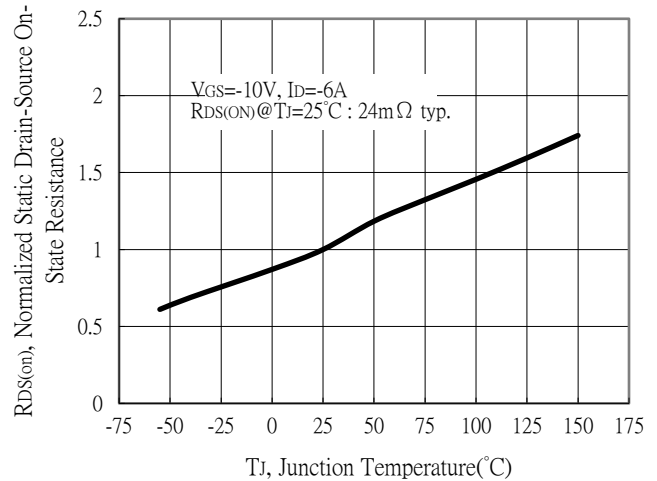
Body Diode Current vs Source-Drain Voltage



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

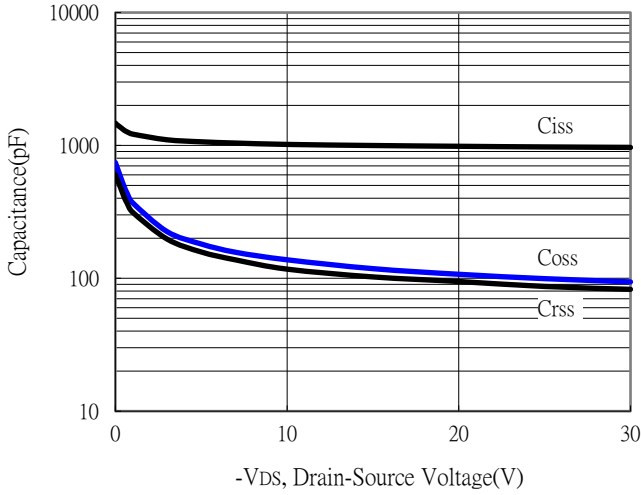


Drain-Source On-State Resistance vs Junction Temperature

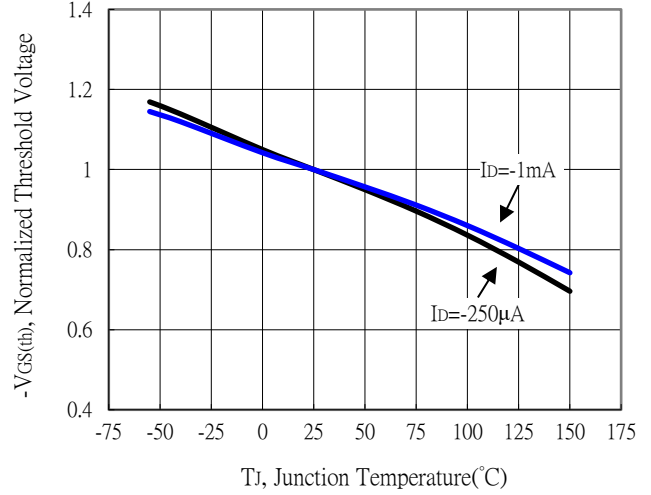


P-Channel Typical Characteristics

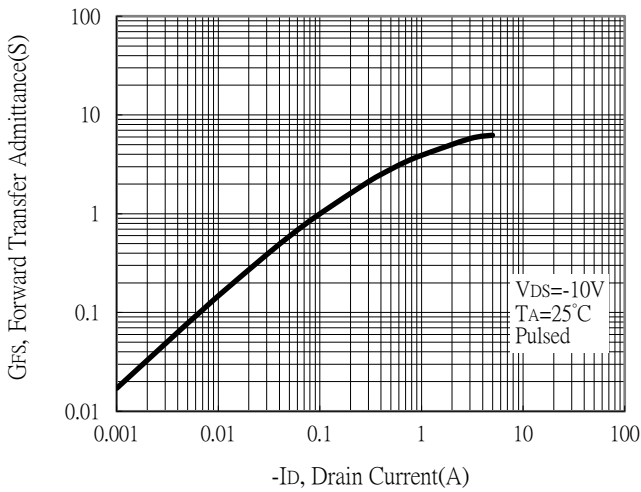
Capacitance vs Drain-to-Source Voltage



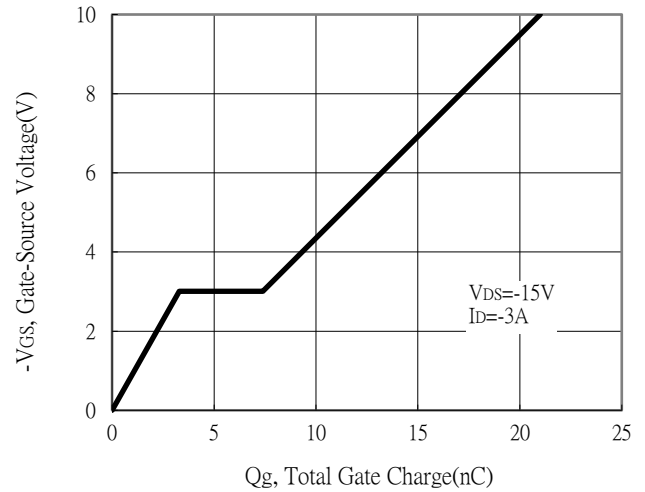
Threshold Voltage vs Junction Temperature



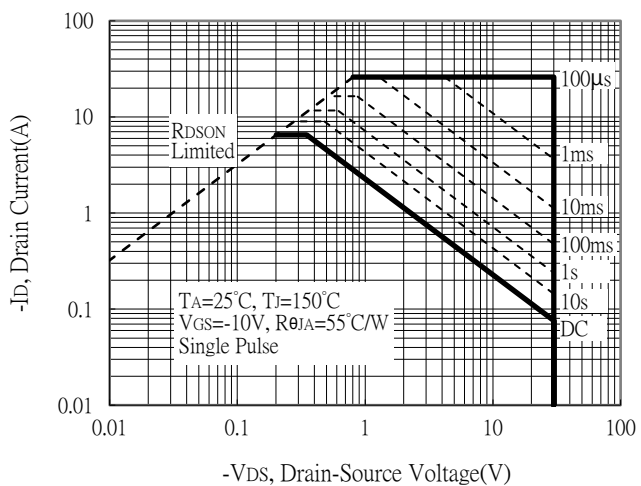
Forward Transfer Admittance vs Drain Current



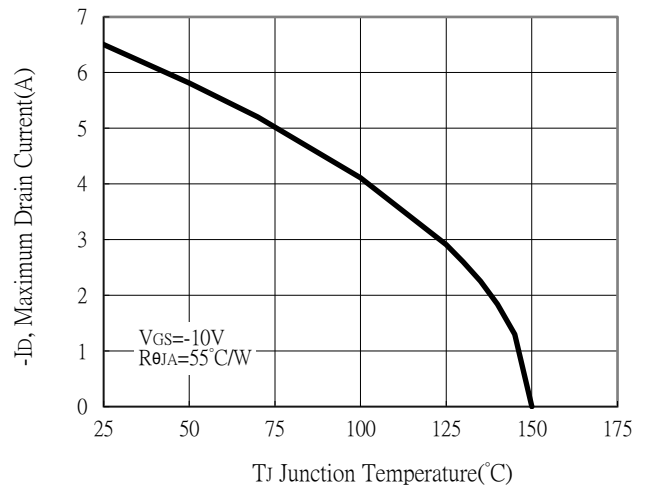
Gate Charge Characteristics



Maximum Safe Operating Area

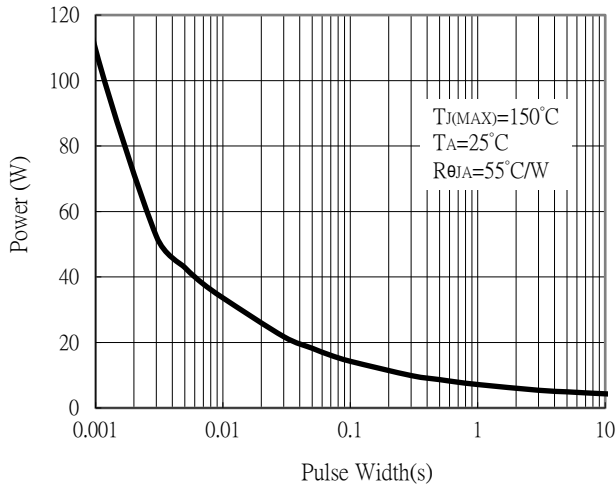


Maximum Drain Current vs Junction Temperature

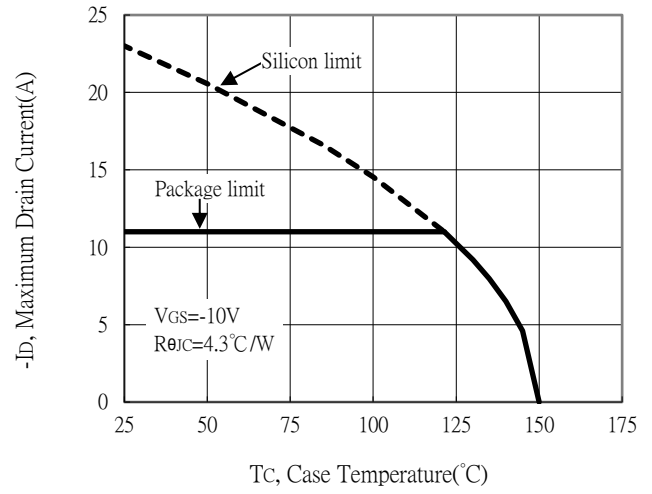


P-Channel Typical Characteristics

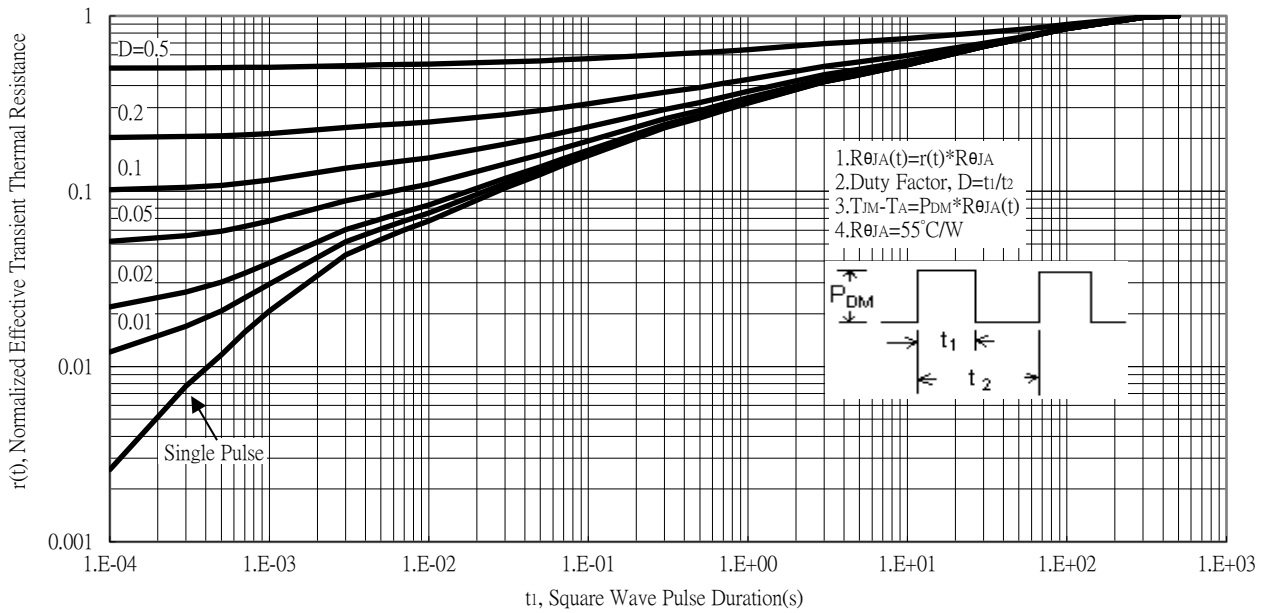
Single Pulse Power Rating, Junction to Ambient



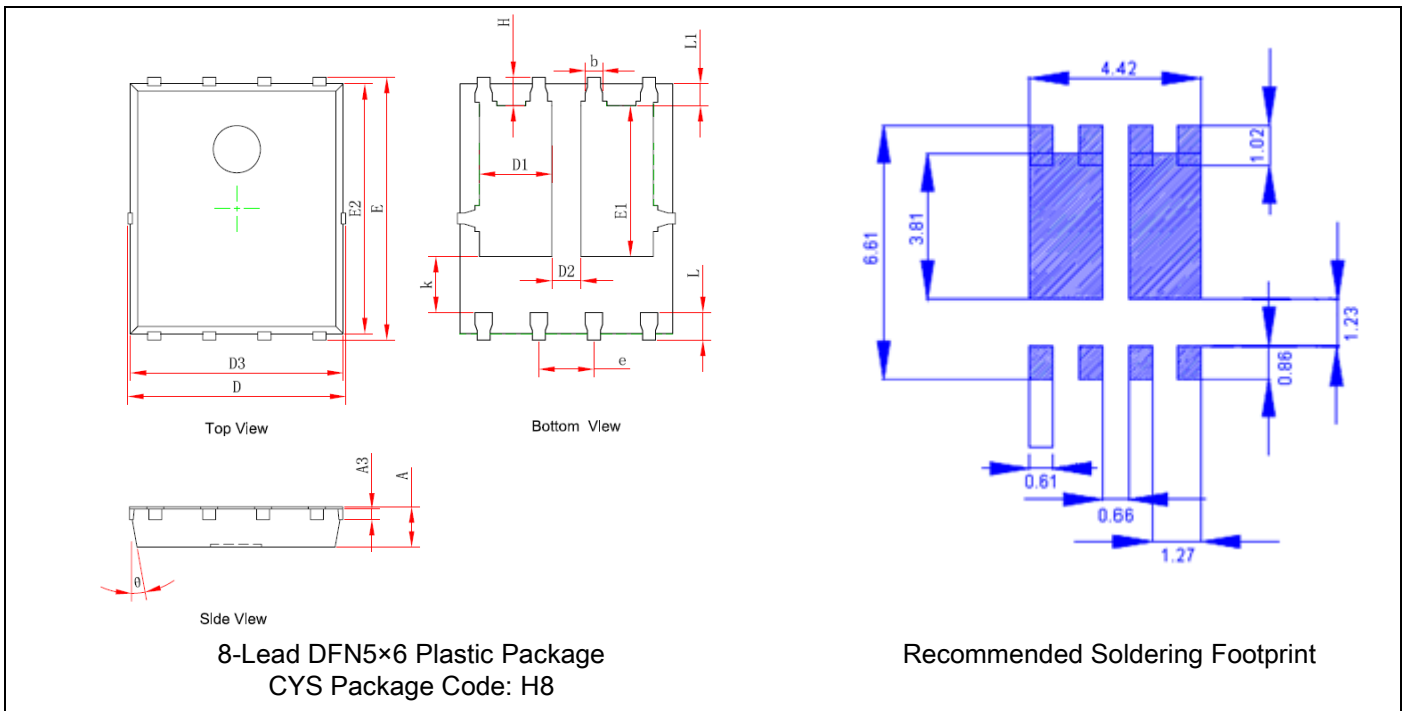
Maximum Drain Current vs Case Temperature



Transient Thermal Response Curves



DFN5×6 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.039	0.900	1.000	E2	0.223	0.229	5.674	5.826
A3	0.010	REF	0.254	REF	k	0.047	0.055	1.190	1.390
D	0.195	0.201	4.944	5.096	b	0.014	0.018	0.350	0.450
E	0.235	0.241	5.974	6.126	e	0.050	TYP	1.270	TYP
D1	0.058	0.074	1.470	1.870	L	0.022	0.028	0.559	0.711
D2	0.019	0.034	0.470	0.870	L1	0.017	0.023	0.424	0.576
E1	0.133	0.141	3.375	3.575	H	0.023	0.029	0.574	0.726
D3	0.190	0.196	4.824	4.976	theta	10°	12°	10°	12°

Note:

- Controlling dimension: millimeters.
- Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
- If there is any question with packing specification or packing method, please contact your local CYStek sales office.

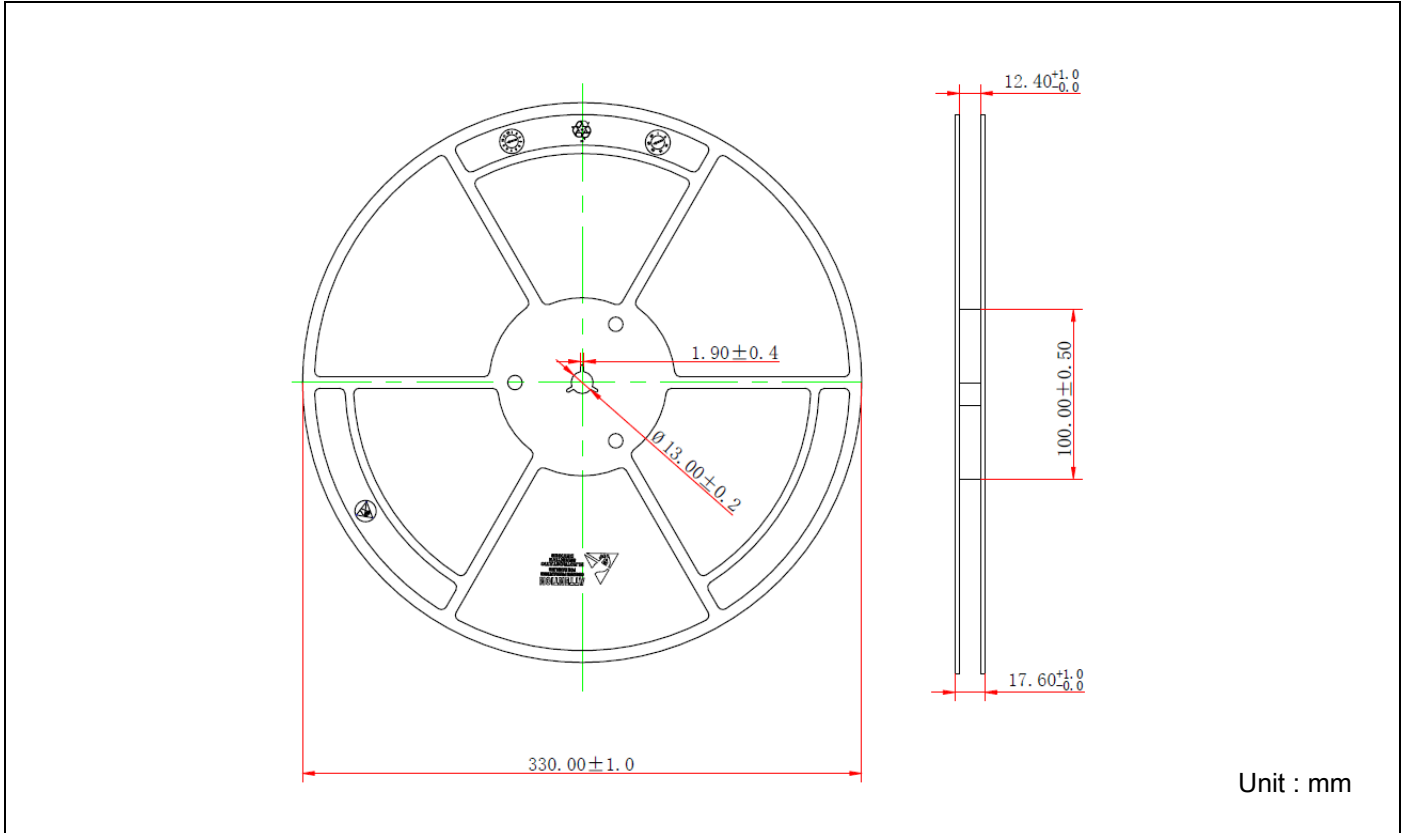
Material:

- Lead: pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

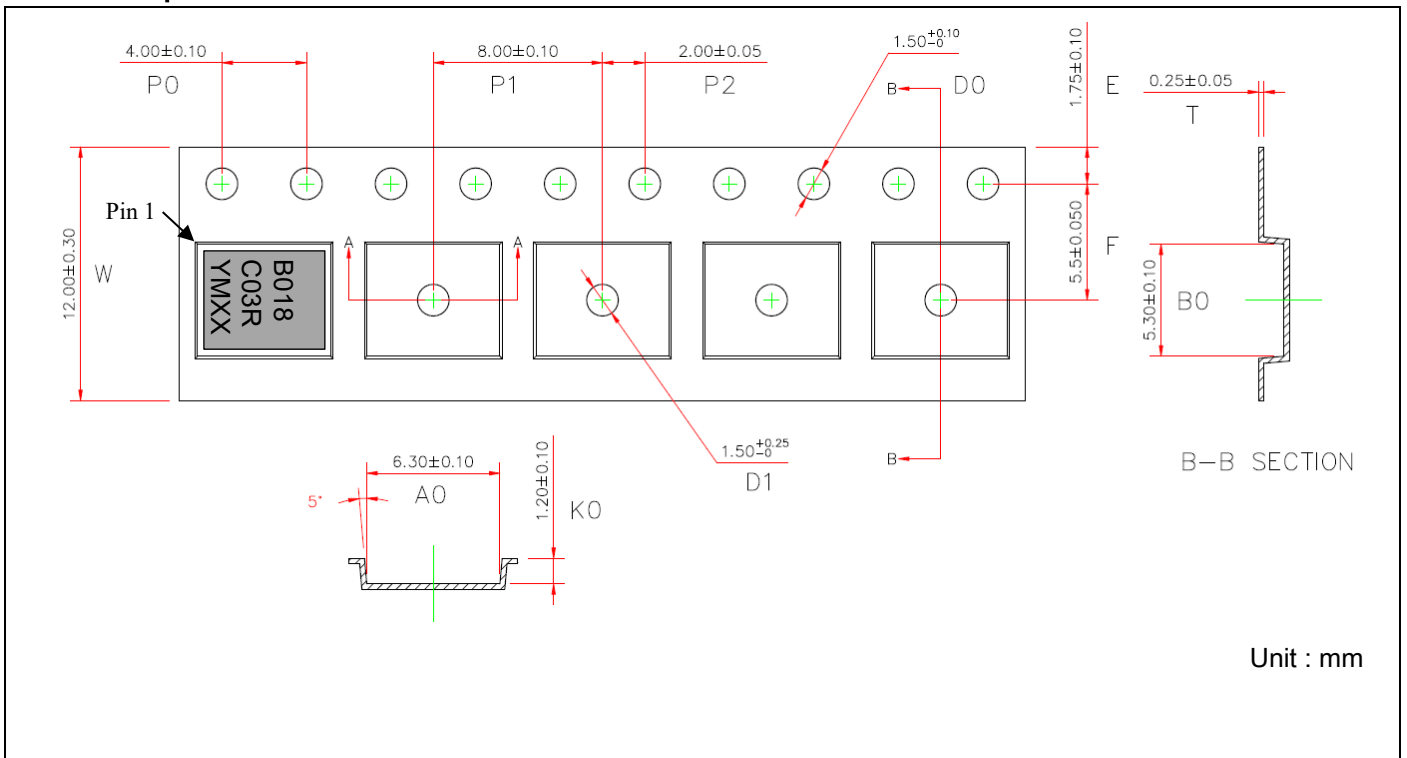
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Reel Dimension



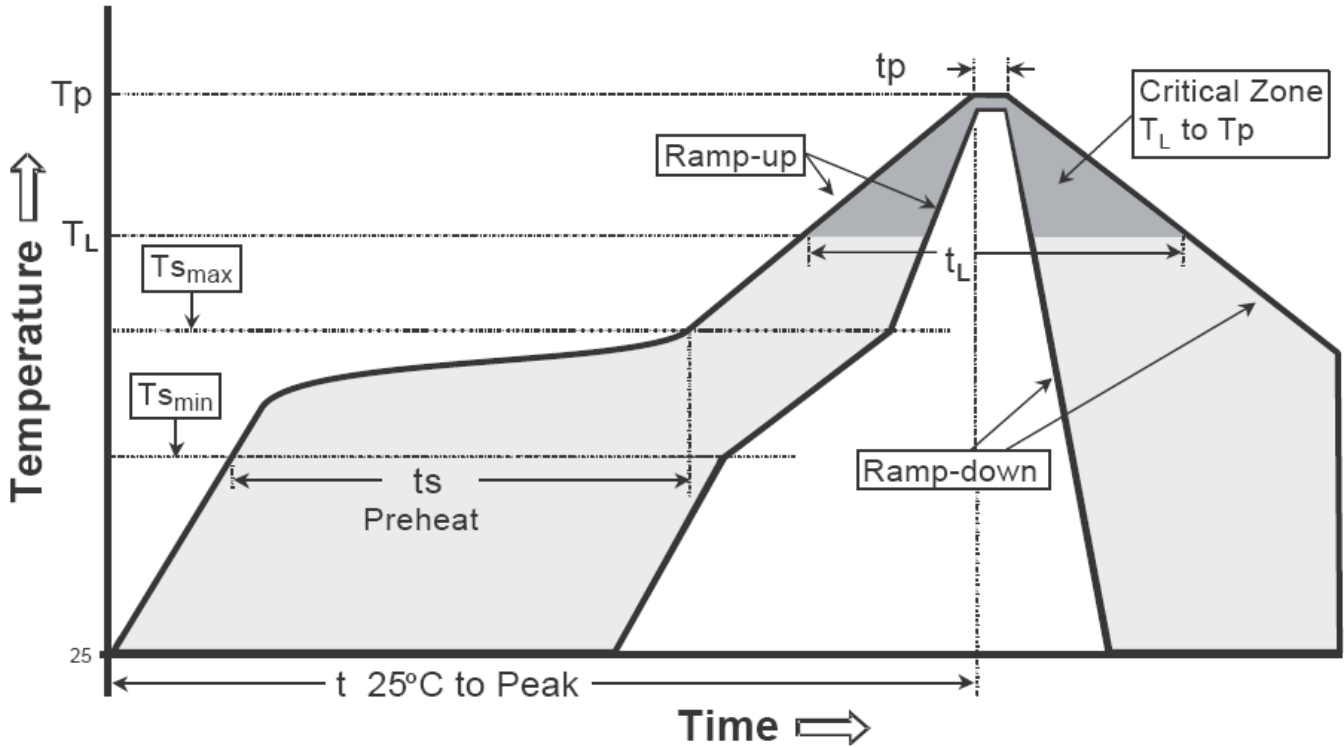
Carrier Tape Dimension



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Ts max to Tp)	3°C/second max.	3°C/second max.
Preheat -Temperature Min (Ts min) -Temperature Max (Ts max) -Time (ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (Tl) -Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (Tp)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature (tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note:

- All temperatures refer to topside of the package, measured on the package body surface.