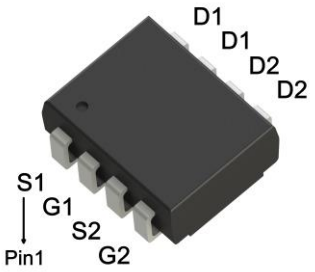
Product Summary

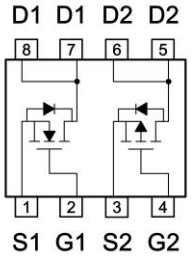
	N-CH	P-CH	
BV_{DSS}	30	-30	V
$R_{DS(ON)}$ typ. @ V_{GS}=(-)10V	15	35	mΩ
$R_{DS(ON)}$ typ. @ V_{GS}=(-)4.5V	20	52	
I_D @ V_{GS}=(-)10V, T_C=25°C	10.4	-7.3	A
I_D @ V_{GS}=(-)10V, T_A=25°C	6.2	-4.3	

Features

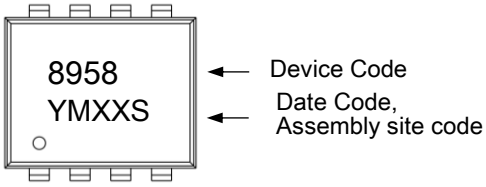
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

2928-8J





Marking



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
S: Assembly site code, Site 1: G

Ordering Information

Device	Package	Shipping
MTC8958N8J-0-T1-G	2928-8J	3000pcs / Tape & Reel

0: Product rank, zero for no rank products.
T1: Packing spec, T1 : 3000pcs / tape & reel, 7" reel
G: Environment friendly grade: S for RoHS compliant products, G for RoHS compliant and green compound products.

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Value N-CH	Value P-CH	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	*a	I_D	10.4	-7.3	A
Continuous Drain Current @ V_{GS}=(-)10V, T_C=100°C	*a		6.6	-4.6	
Continuous Drain Current @ V_{GS}=(-)10V, T_A=25°C	*b		6.2	-4.3	
Continuous Drain Current @ V_{GS}=(-)10V, T_A=70°C	*b		5	-3.4	
Pulsed Drain Current	*c	I_{DM}	40	-28	
Continuous Body Diode Forward Current @ T_C=25°C		I_S	3.2	-3.2	
Pulsed Body Diode Forward Current @ T_C=25°C		I_{SM}	12.8	-12.8	
Avalanche Current @ L=0.1mH		I_{AS}	10	-9	
Avalanche Energy @ L=0.5mH		E_{AS}	9	6.3	mJ
Total Power Dissipation	T_C=25°C *a	P_D	3.9		W
	T_C=100°C *a		1.6		
	T_A=25°C *b		1.4		
	T_A=70°C *b		0.9		
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150		°C
Steady State Thermal Resistance, Junction-to-Ambient		$R_{\theta JC}$	32		°C/W
Steady State Thermal Resistance, Junction-to-Ambient	*b	$R_{\theta JA}$	90		

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}	-	4.6	-	S	V_{DS}=10V, I_D=3A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0V
$R_{DS(ON)}$	-	15	20	mΩ	V_{GS}=10V, I_D=5A
	-	20	28		V_{GS}=4.5V, I_D=4A
Dynamic					
C_{iss}	-	560	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
C_{oss}	-	75	-		
C_{rss}	-	55	-		
Rg	-	3.3	-	Ω	f=1MHz
Q_g *d,e	-	6	-	nC	V_{DS}=15V, I_D=5A, V_{GS}=4.5V
Q_g *d,e	-	12	-		V_{DS}=15V, I_D=5A, V_{GS}=10V
Q_{gs} *d,e	-	2	-		
Q_{gd} *d,e	-	2.3	-		
$t_{d(ON)}$ *d,e	-	6.3	-	ns	V_{DS}=15V, I_D=5A, V_{GS}=10V, R_{GS}=1Ω
tr *d,e	-	15	-		
$t_{d(OFF)}$ *d,e	-	26	-		
t_f *d,e	-	6	-		
Source-Drain Diode					
V_{SD} *d	-	0.84	1.2	V	I_S=5A, V_{GS}=0V
t_{rr}	-	7	-	ns	I_F=5A, 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 $R_{\theta JA}$ 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 $R_{\theta JA}$ 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}	-	4.2	-	S	V_{DS}=-10V, I_D=-3A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS}=-24V, V_{GS}=0V
$R_{DS(ON)}$	-	35	46	mΩ	V_{GS}=-10V, I_D=-4A
	-	52	73		V_{GS}=-4.5V, I_D=-3A
Dynamic					
C_{iss}	-	650	-	pF	V_{DS}=-15V, V_{GS}=0V, f=1MHz
C_{oss}	-	75	-		
C_{rss}	-	65	-		
Rg	-	15	-	Ω	f=1MHz
Q_g *d,e	-	6.5	-	nC	V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V
Q_g *d,e	-	13	-		V_{DS}=-15V, I_D=-4A, V_{GS}=-10V
Q_{gs} *d,e	-	2.2	-		
Q_{gd} *d,e	-	2.5	-		
$t_{d(ON)}$ *d,e	-	5.8	-	ns	V_{DS}=-15V, I_D=-4A, V_{GS}=-10V, R_{GS}=1Ω
tr *d,e	-	16	-		
$t_{d(OFF)}$ *d,e	-	40	-		
t_f *d,e	-	9	-		
Source-Drain Diode					
V_{SD} *d	-	-0.87	-1.2	V	I_S=-4A, V_{GS}=0V
t_{rr}	-	7.3	-	ns	I_F=-4A, di/dt=100A/μs
Q_{rr}	-	3.1	-	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 $R_{\theta JA}$ 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 $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends

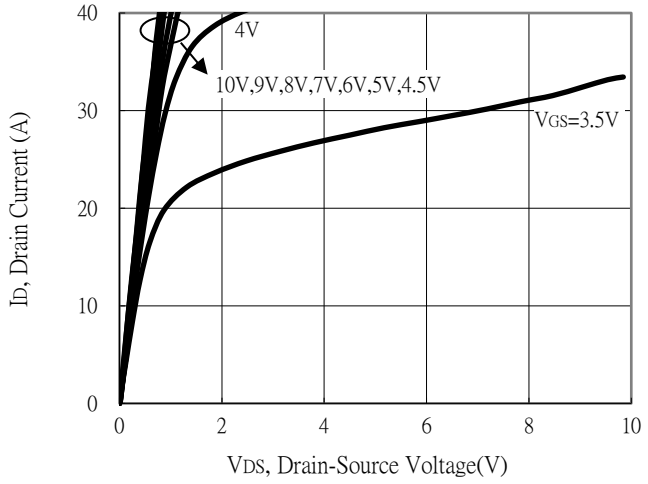
*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to

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

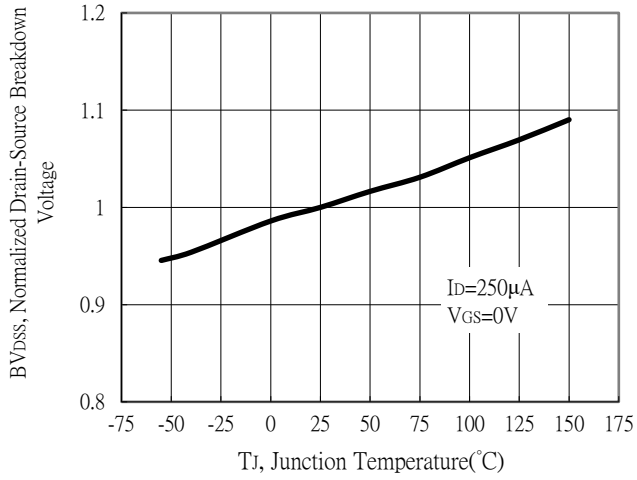
*e. Independent of operating temperature.

N-Channel Typical Characteristics

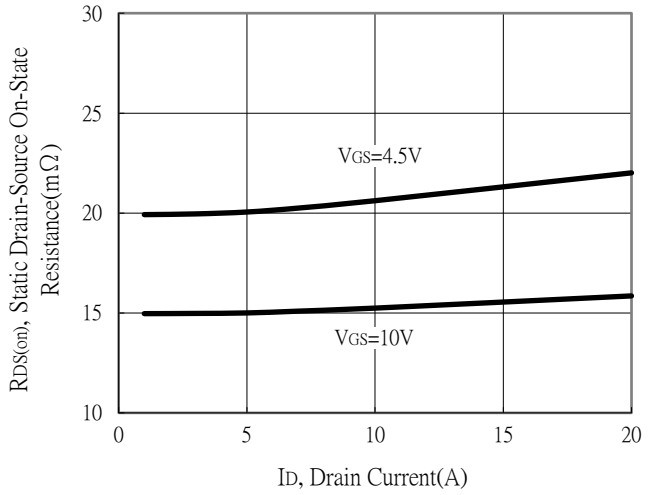
Typical Output Characteristics



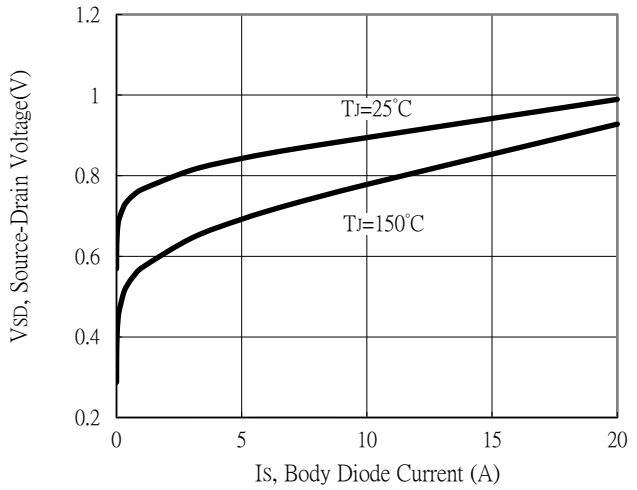
Breakdown Voltage vs Ambient Temperature



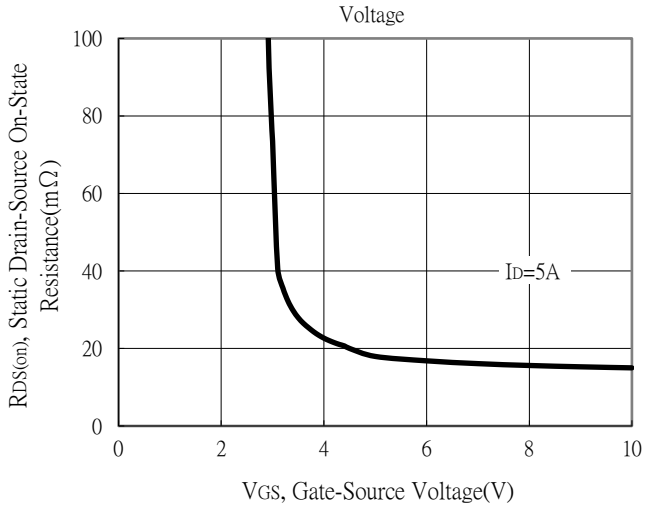
Static Drain-Source On-State resistance vs Drain Current



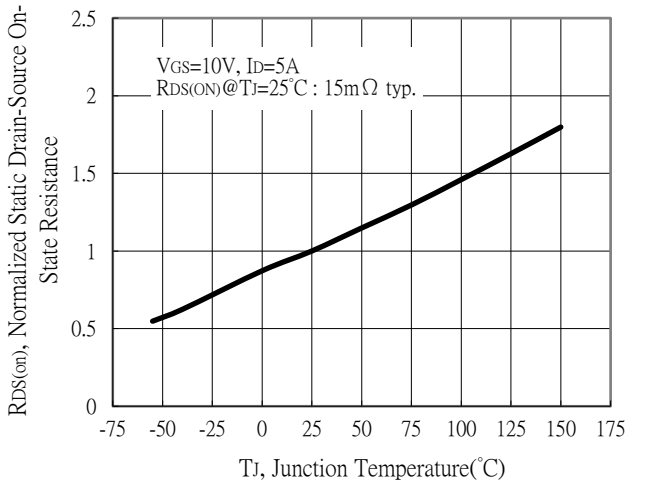
Body Diode Current vs Source-Drain Voltage



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

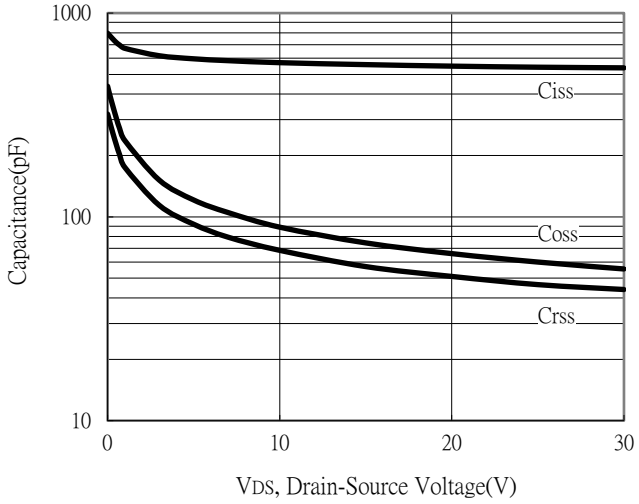


Drain-Source On-State Resistance vs Junction Temperature

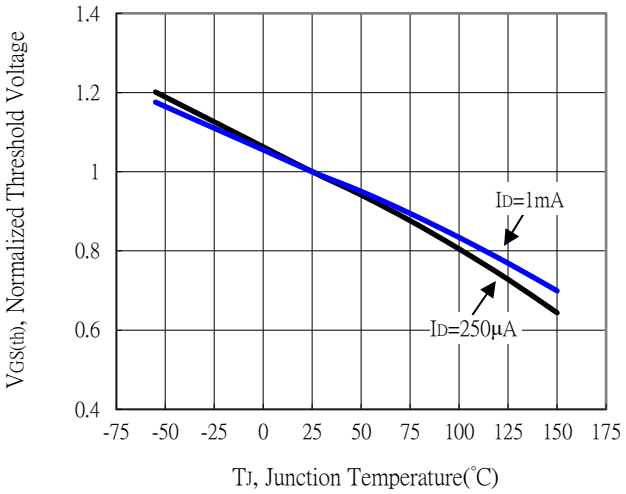


N-Channel Typical Characteristics

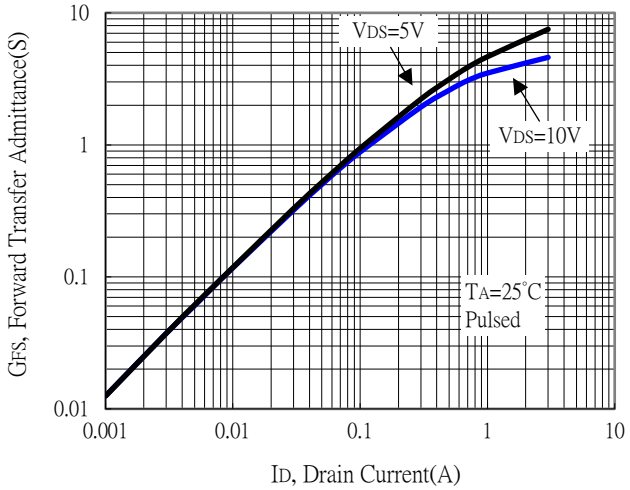
Capacitance vs Drain-to-Source Voltage



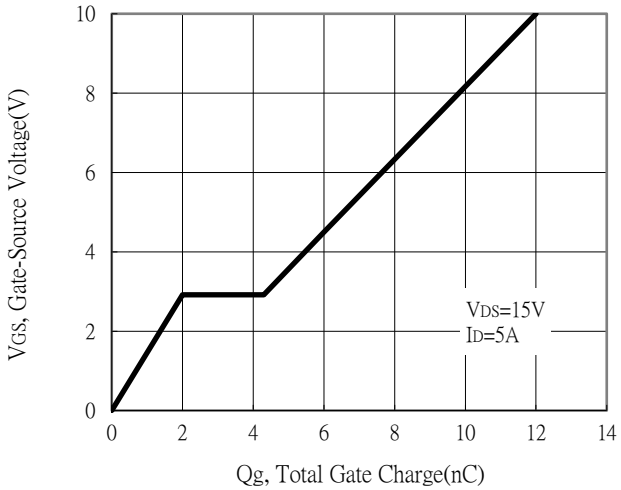
Threshold Voltage vs Junction Temperature



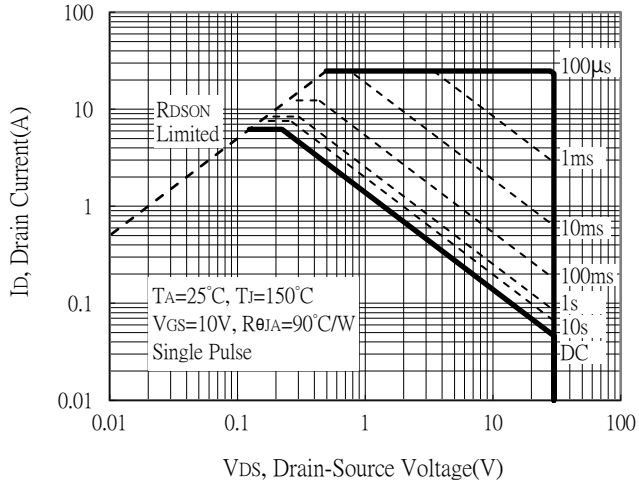
Forward Transfer Admittance vs Drain Current



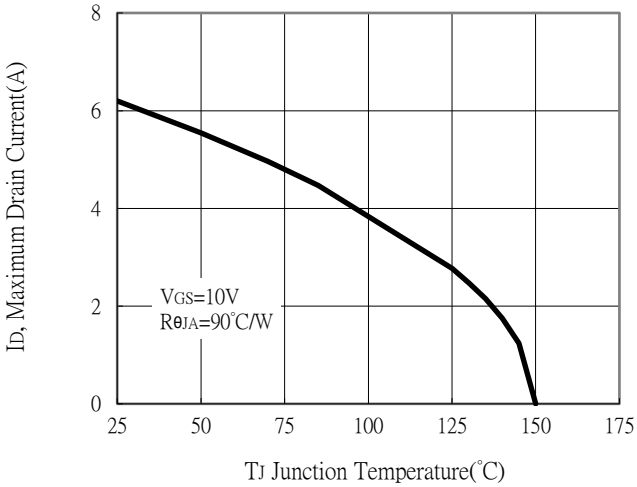
Gate Charge Characteristics



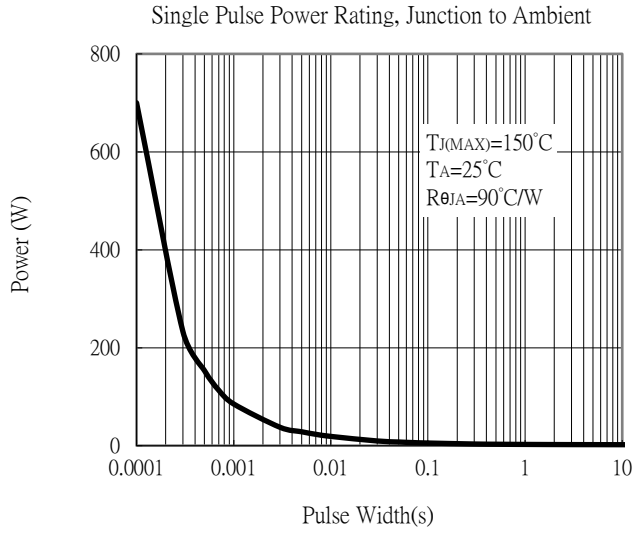
Maximum Safe Operating Area

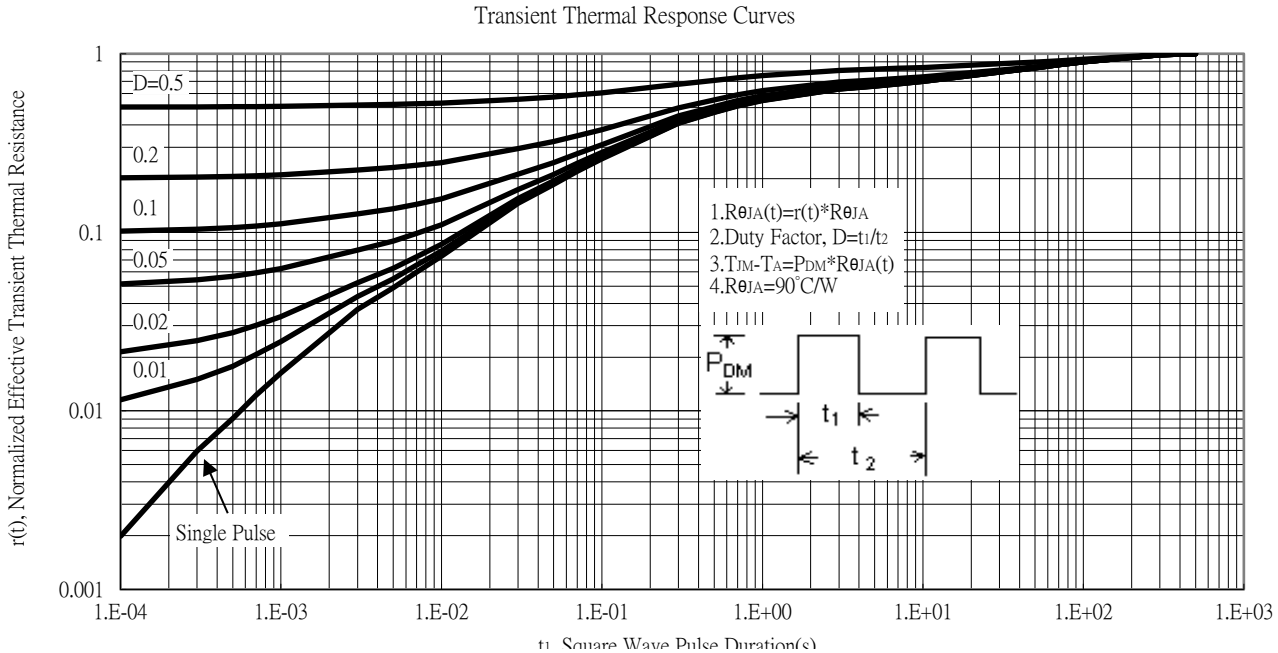


Maximum Drain Current vs Junction Temperature



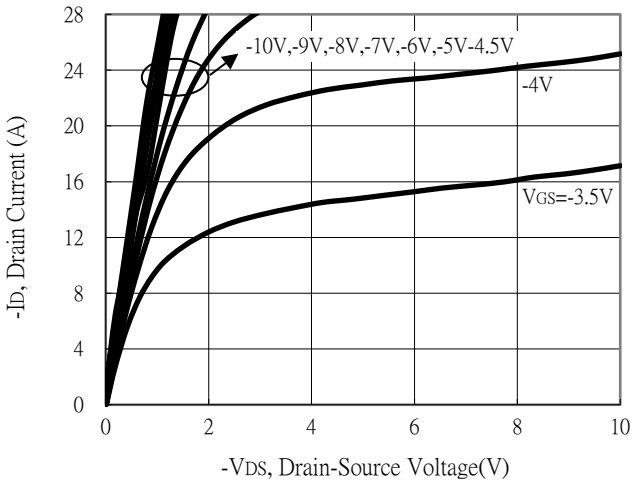
N-Channel Typical Characteristics



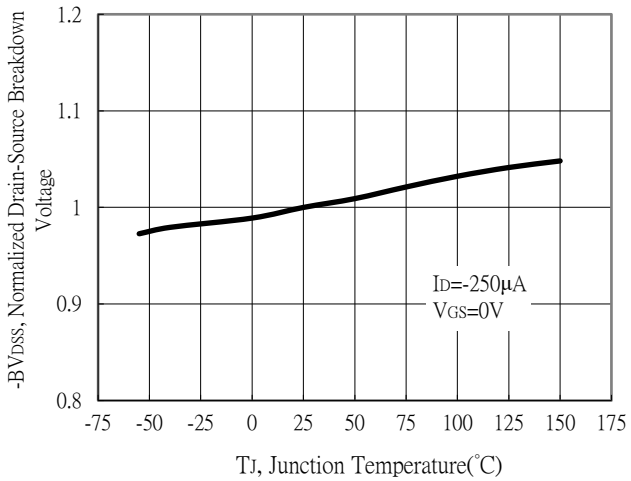


P-Channel Typical Characteristics

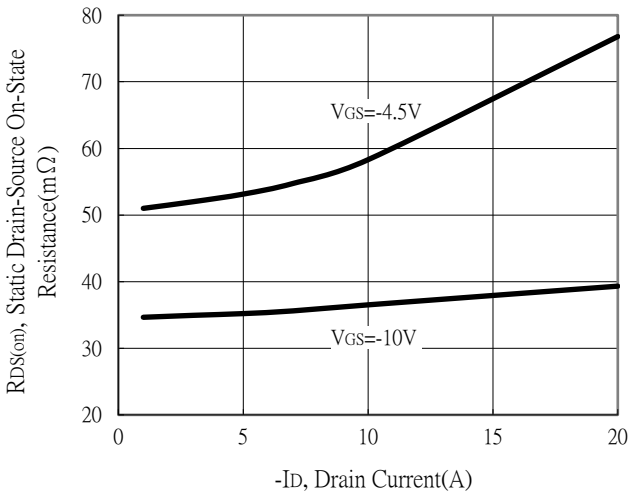
Typical Output Characteristics



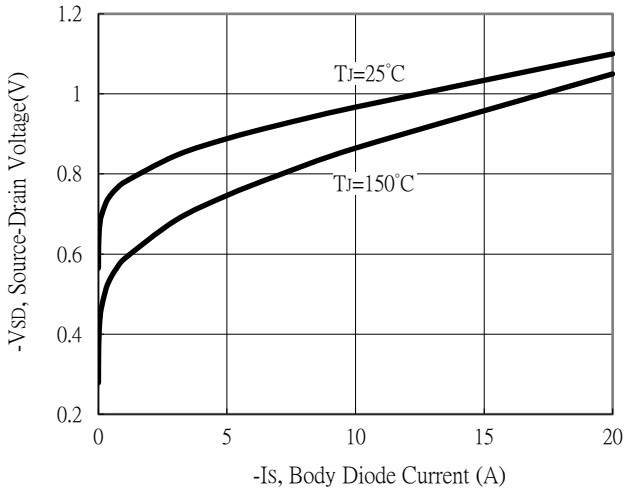
Breakdown Voltage vs Ambient Temperature



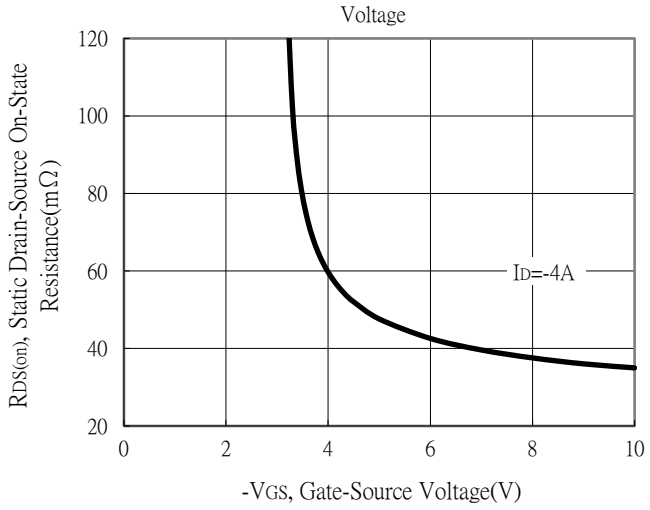
Static Drain-Source On-State resistance vs Drain Current



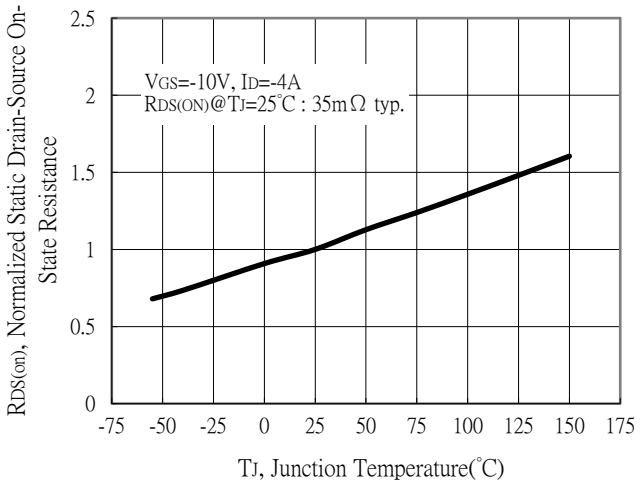
Body Diode Current vs Source-Drain Voltage



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

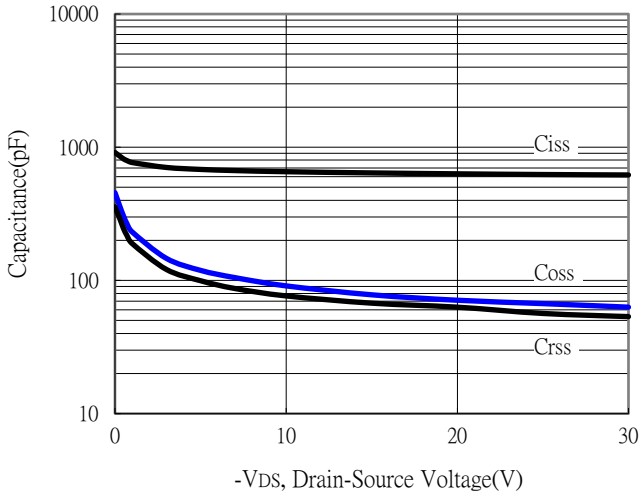


Drain-Source On-State Resistance vs Junction Temperature

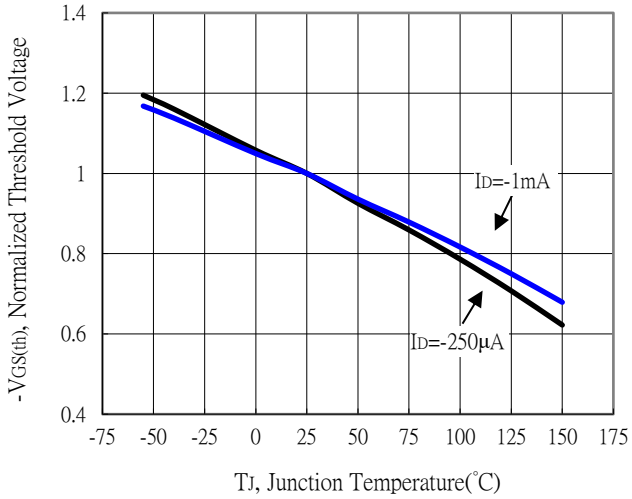


P-Channel Typical Characteristics

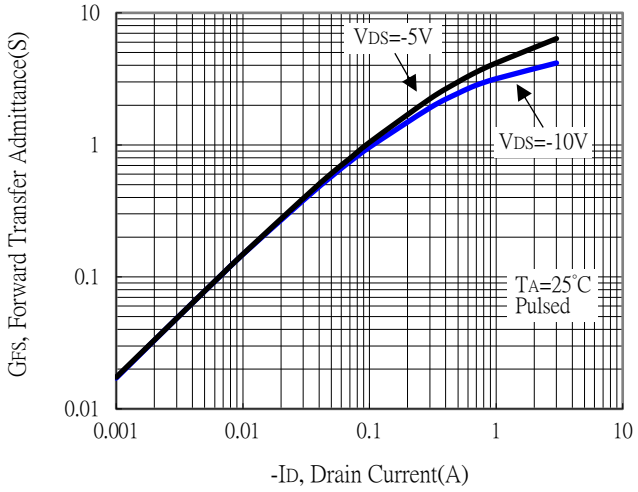
Capacitance vs Drain-to-Source Voltage



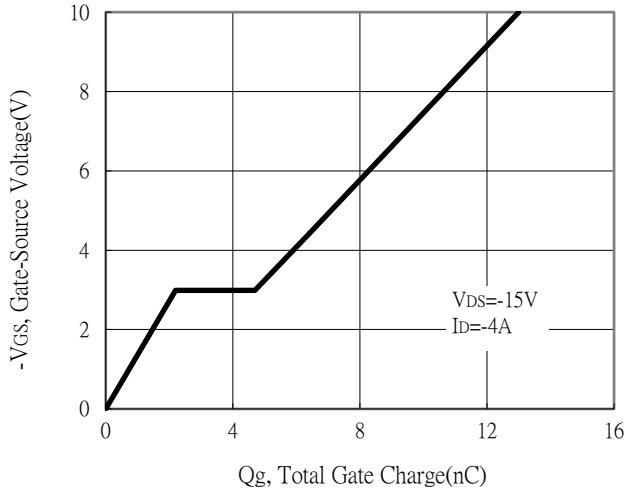
Threshold Voltage vs Junction Temperature



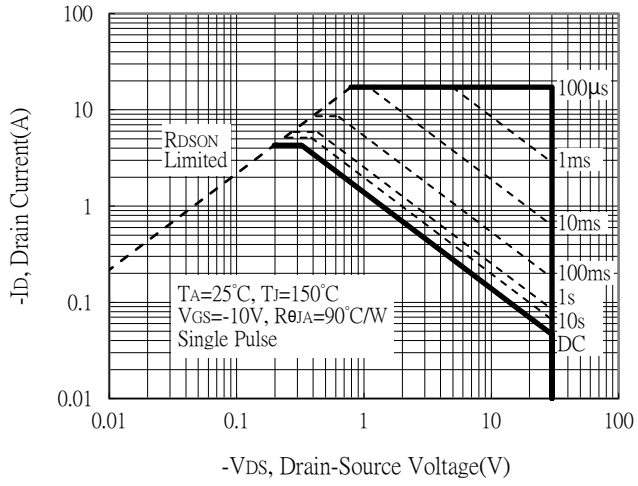
Forward Transfer Admittance vs Drain Current



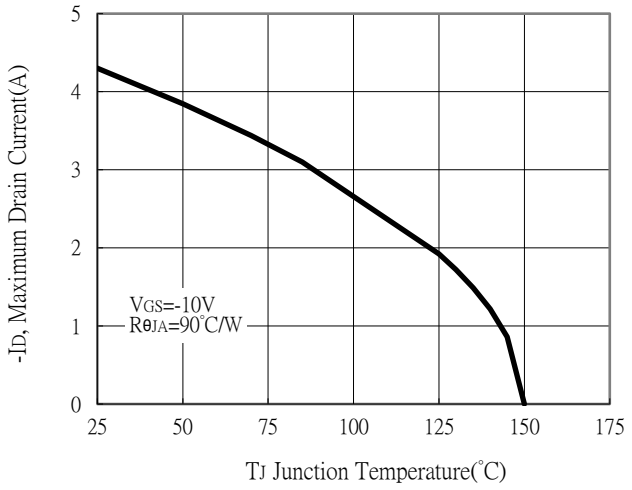
Gate Charge Characteristics



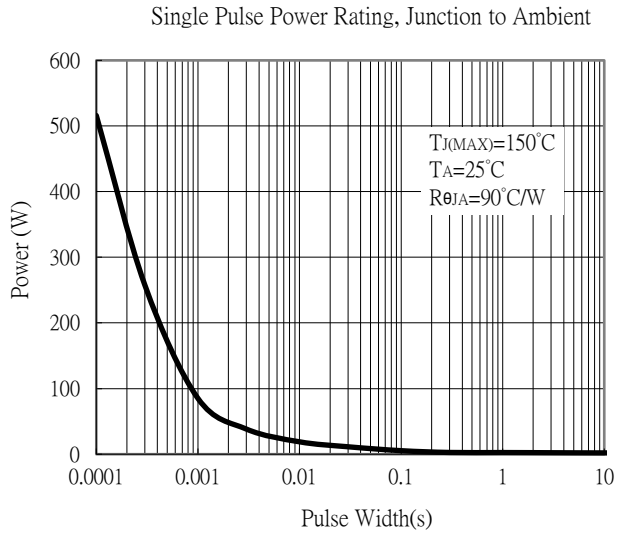
Maximum Safe Operating Area

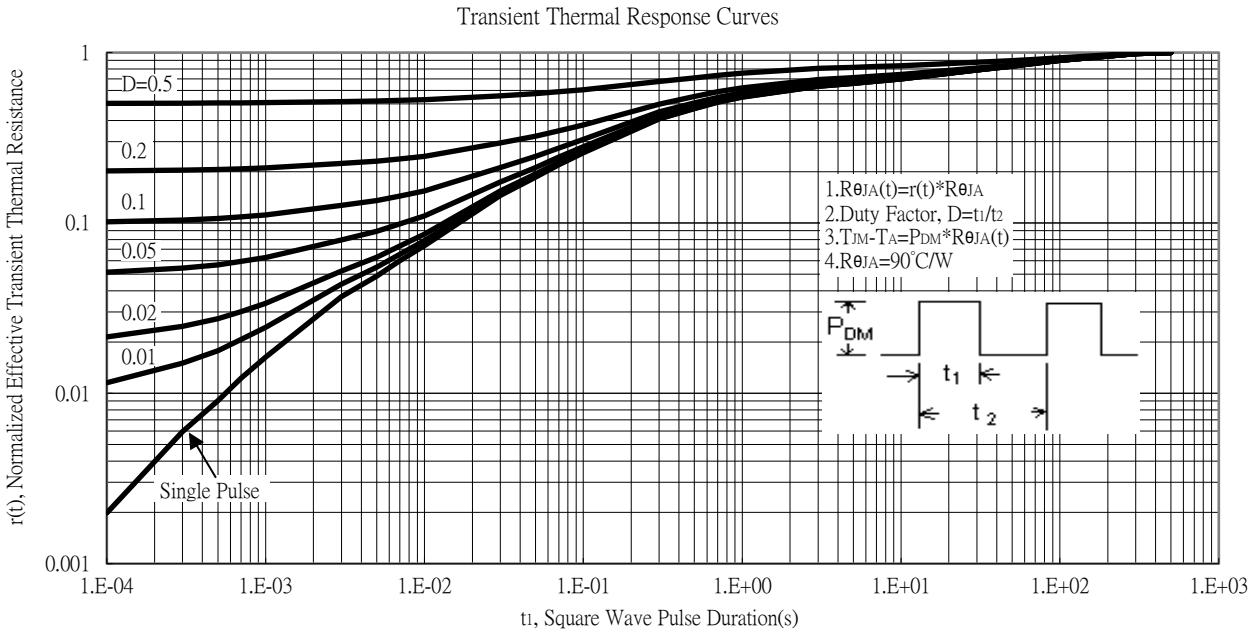


Maximum Drain Current vs Junction Temperature

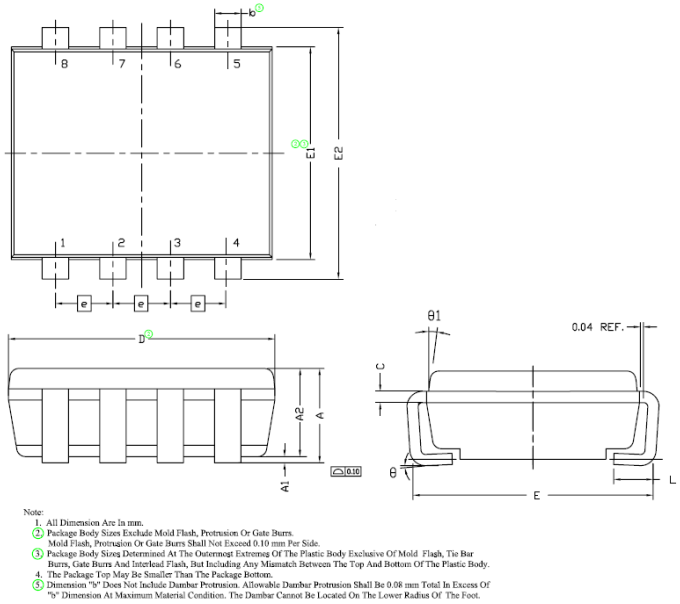


P-Channel Typical Characteristics

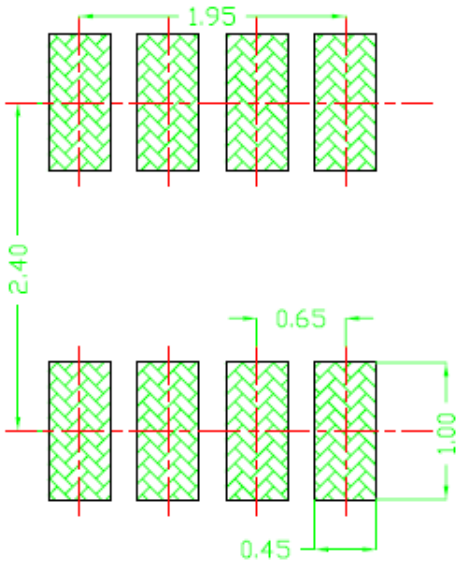




2928-8J Dimension



8-Lead 2928-8J Plastic Package
CYS Package Code: N8J



Recommended Soldering Footprint

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0368	0.0433	0.935	1.100	E1	0.0906	0.0984	2.300	2.500
A1	0.0004	0.0039	0.010	0.100	E2	0.1043	0.1201	2.650	3.050
A2	0.0364	0.0394	0.925	1.000	e	0.0256	BSC	0.650	BSC
b	0.0098	0.0157	0.250	0.400	L	0.0118	0.0236	0.300	0.600
c	0.0039	0.0079	0.100	0.200	θ	0°	8°	0°	8°
D	0.1161	0.1220	2.950	3.100	θ1	7°	TYP	7°	TYP
E	0.0984	0.1181	2.500	3.000					

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.

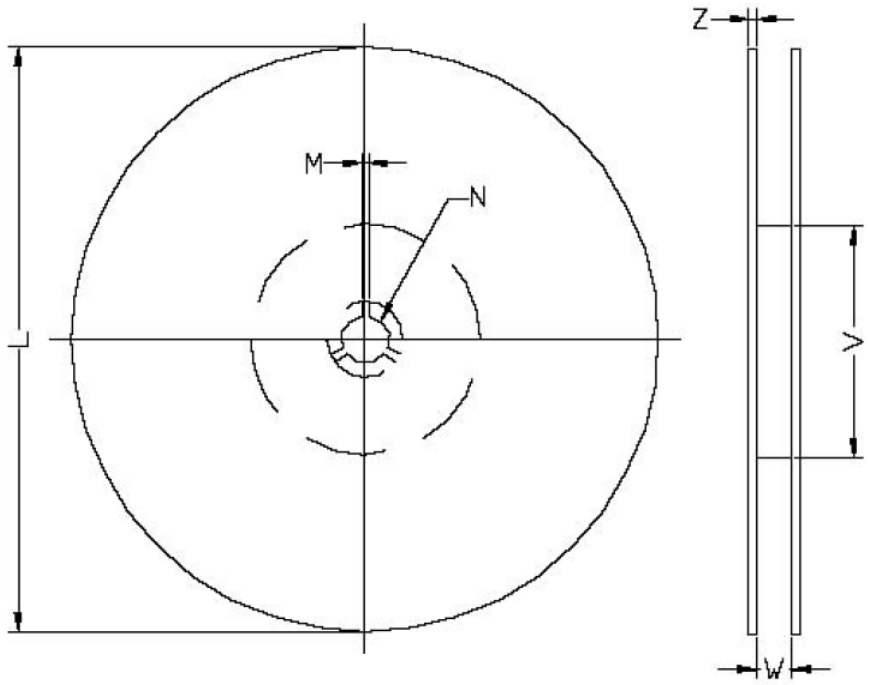
Material:

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

Important Notice:

- CYStek reserves the right to make changes to its products without notice.
- CYStek semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

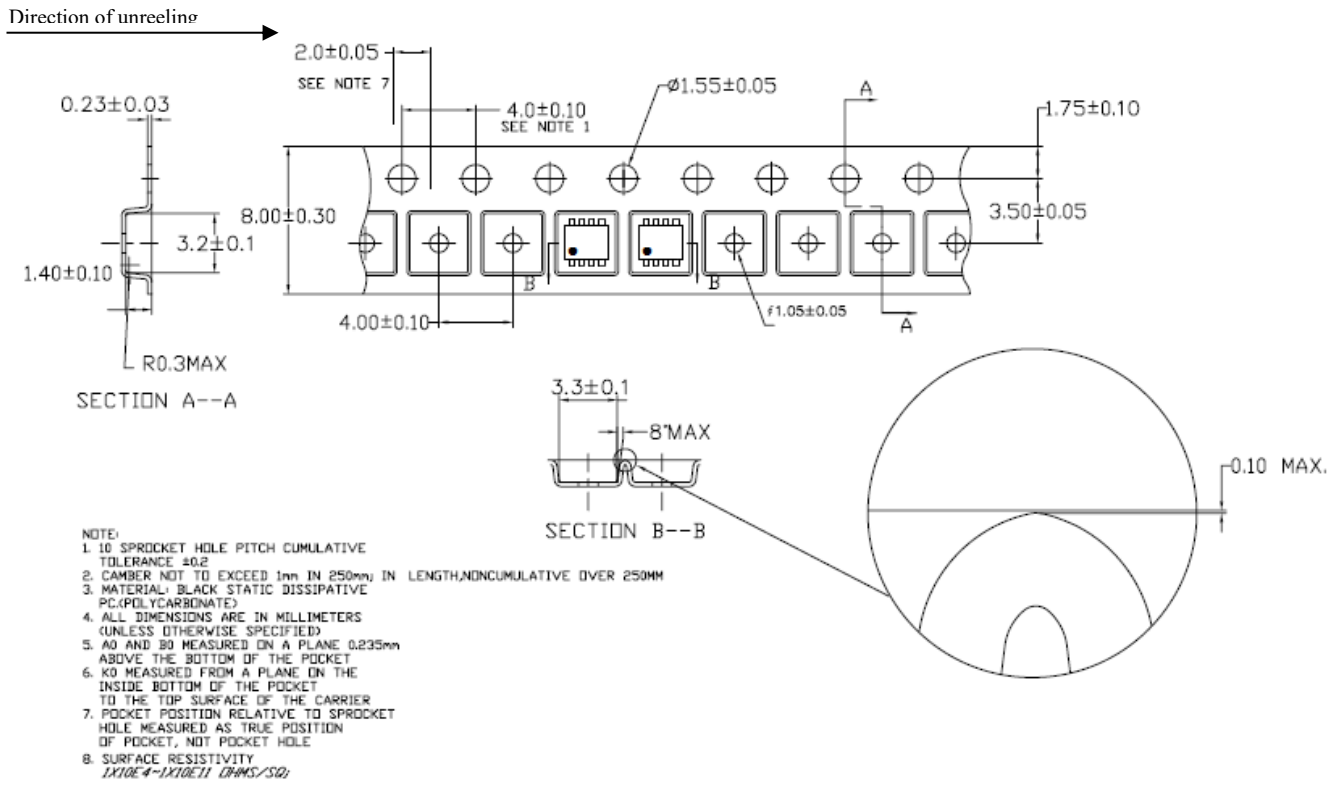
Reel Dimension



Unit: mm

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

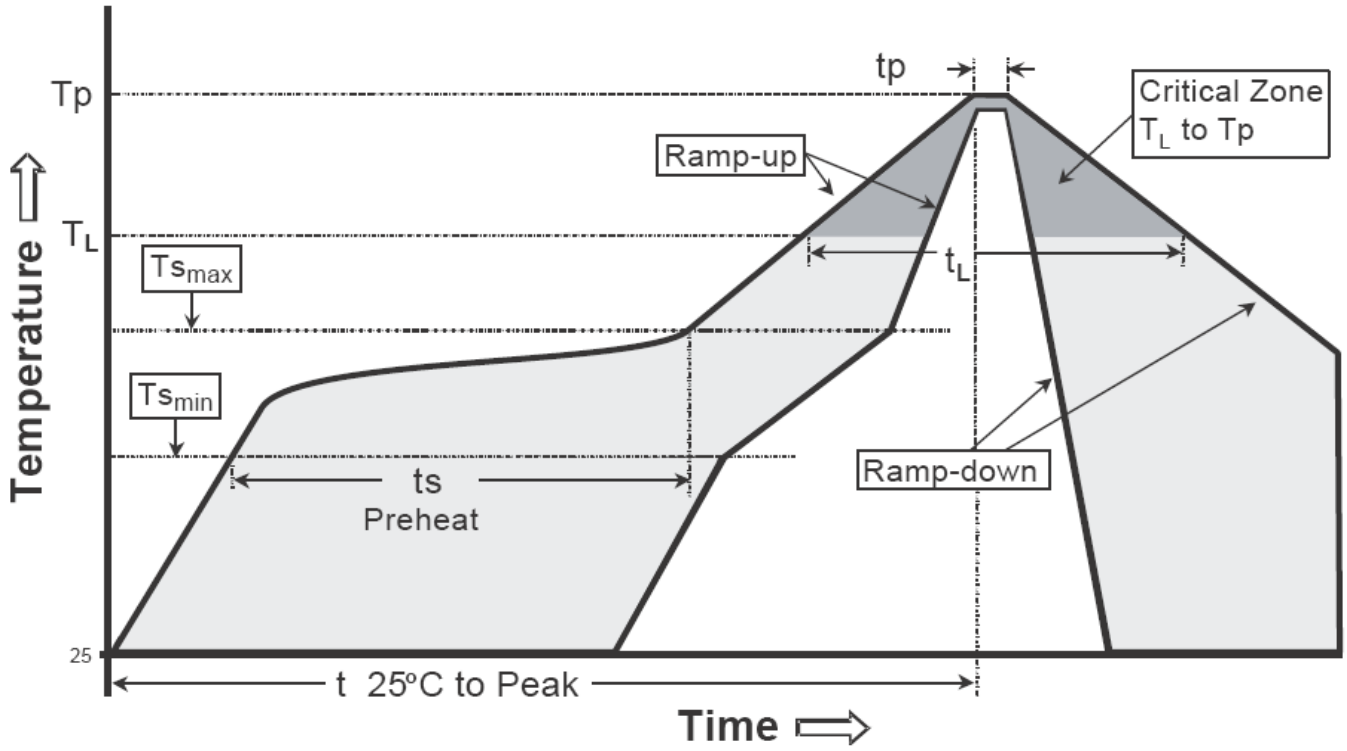
Carrier Tape Dimension



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 (T_S max to T_P)	3°C/second max.	3°C/second max.
Preheat −Temperature Min (T_S min) −Temperature Max (T_S max) −Time (t_S min to t_S max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) −Time (t_L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (T_P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature (t_P)	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.