

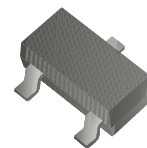
CMSP3413T-HF (P-Channel)

Reverse Voltage: - 20 Volts

Forward Current: - 4.9 A

RoHS Device

Halogen Free

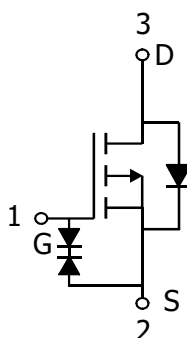


V(BR)DSS	RDS(ON)MAX	Id
-20V	39mΩ@-4.5V	-4.9A
	51mΩ@-2.5V	
	75mΩ@-1.8V	

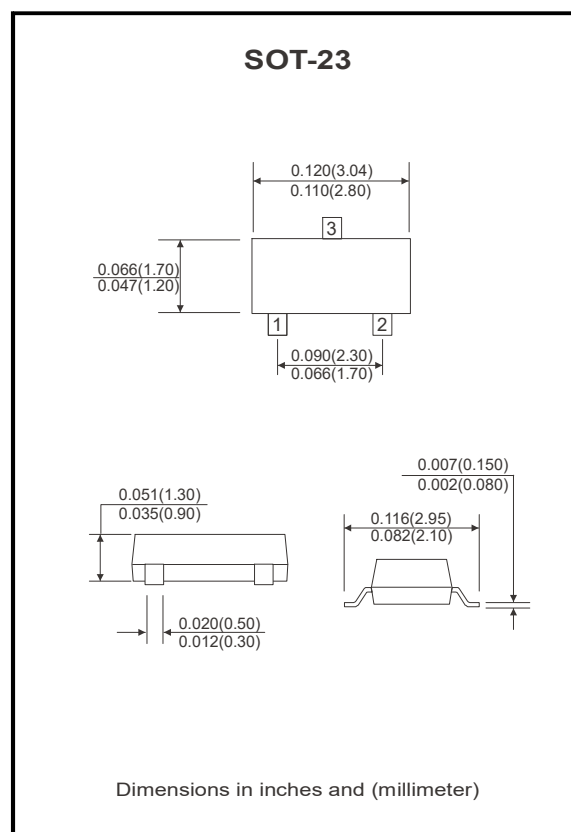
Features

- 1.8V gate rated
- Advanced trench process technology
- High density cell design for ultra low on resistance
- Pb-free lead plating and halogen-free package

Circuit diagram



1. G : Gate
2. S : Source
3. D : Drain



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current@T _A =25°C , V _{GS} =-4.5V	I _D	-4.9	A
Continuous Drain Current@T _A =70°C , V _{GS} =-4.5V	I _D	-3.9	A
Pulsed Drain Current (Note 1&2)	I _{DM}	-35	A
Maximum Power Dissipation@T _A =25°C	P _D	1.38	W
Maximum Power Dissipation@T _A =70°C		0.88	
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width ≤ 300 μs, duty cycle ≤ 2%

Electrical Characteristics (T_j=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-20	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-0.4	-	-1.0		V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±12V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-20V, V _{GS} =0V
	-	-	-10		V _{DS} =-20V, V _{GS} =0V, T _j =55°C
*R _{DS(ON)}	-	39	50	mΩ	V _{GS} =-4.5V, I _D =-4.3A
	-	51	65		V _{GS} =-2.5V, I _D =-2.5A
	-	75	100		V _{GS} =-1.8V, I _D =-2.0A
Dynamic					
C _{iss}	-	1220	-	pF	V _{DS} =-10V, V _{GS} =0V, f=1MHz
C _{oss}	-	103	-		
C _{rss}	-	92	-		
*t _{d(ON)}	-	12.5	-	ns	V _{DS} =-10V, I _D =-1A, V _{GS} =-4.5V, R _D =10 Ω, R _G =6 Ω
*t _r	-	12	-		
*t _{d(OFF)}	-	70	-		
*t _f	-	20	-		
*Q _g	-	10	-	nC	V _{DS} =-10V, I _D =-4.3A, V _{GS} =-4.5V
*Q _{gs}	-	1.9	-		
*Q _{gd}	-	2.7	-		
Source-Drain Diode					
*I _{SD}	-	-	-1.3	A	
*I _{SM}	-	-	-35		
*V _{SD}	-	-0.76	-1	V	V _{GS} =0V, I _S =-1.3A
*t _{rr}	-	23	-	ns	I _S =-1.3A, V _{GS} =0V, dI/dt=100A/μs
*Q _{rr}	-	8.5	-	nC	

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

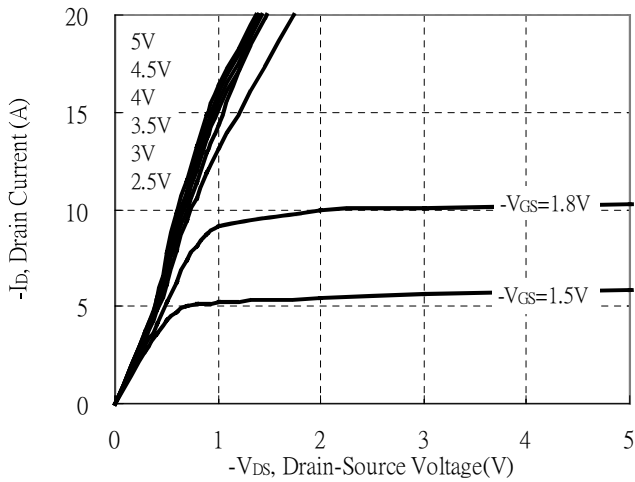
Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient (Note)	R _{th,ja}	90	°C/W

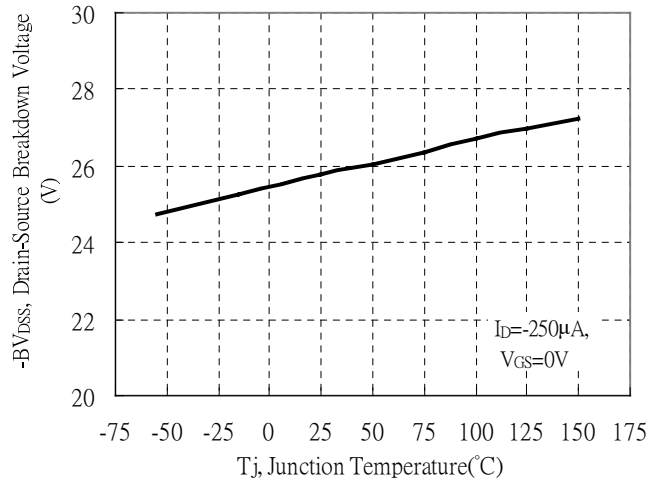
Note : Surface mounted on 1 in² copper pad of FR-4 board, 270°C/W when mounted on minimum copper pad.

Typical Characteristics

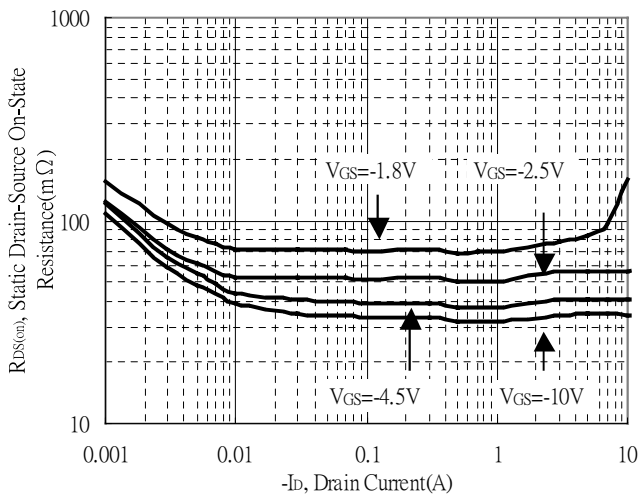
Typical Output Characteristics



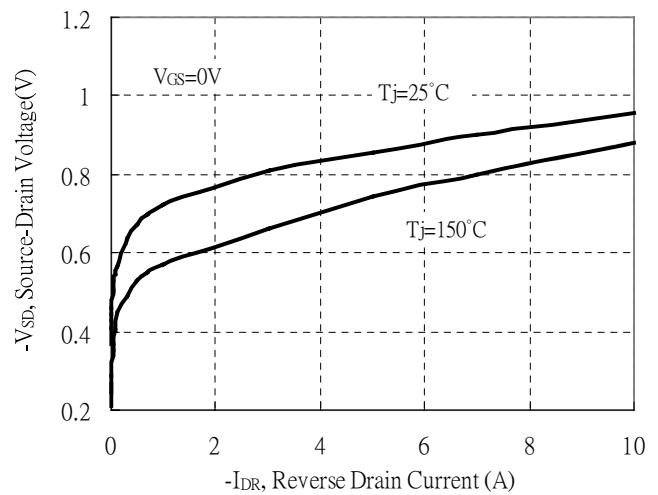
Breakdown Voltage vs Ambient Temperature



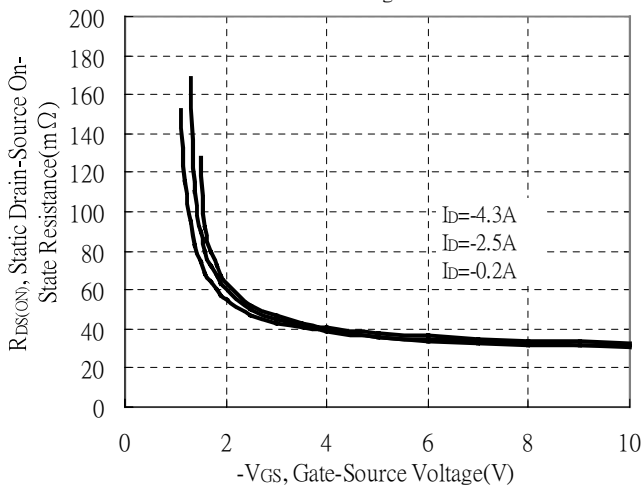
Static Drain-Source On-State resistance vs Drain Current



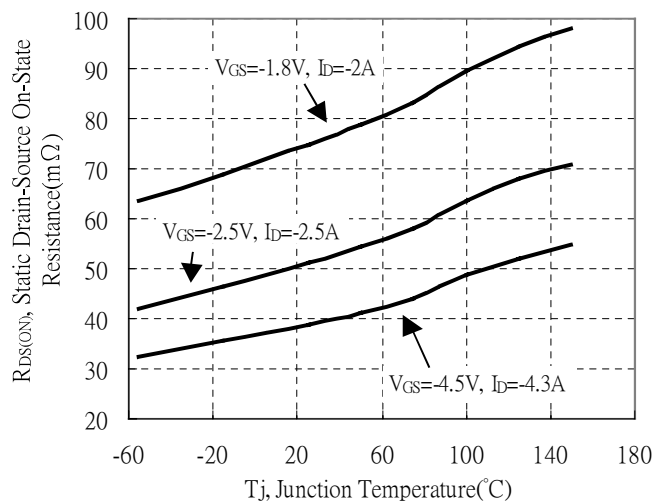
Reverse Drain Current vs Source-Drain Voltage



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

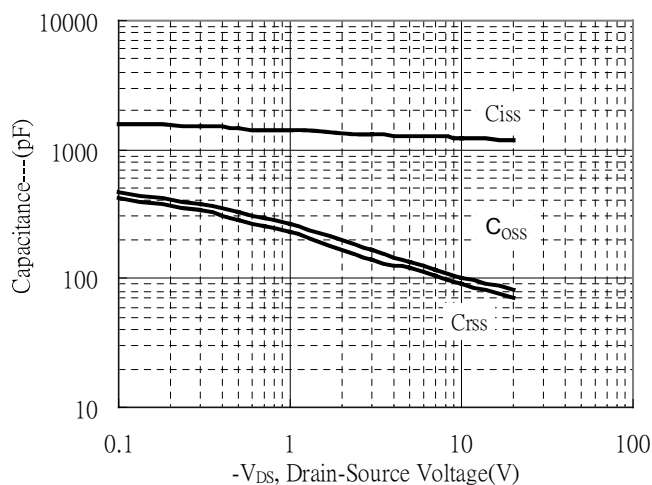


Drain-Source On-State Resistance vs Junction Temperature

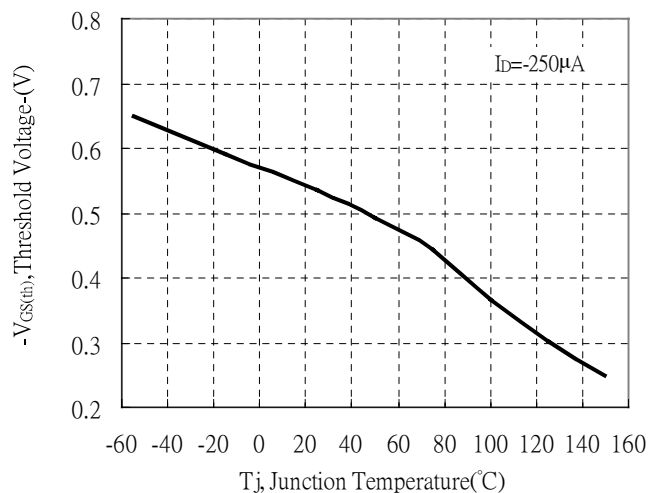


Typical Characteristics(Cont.)

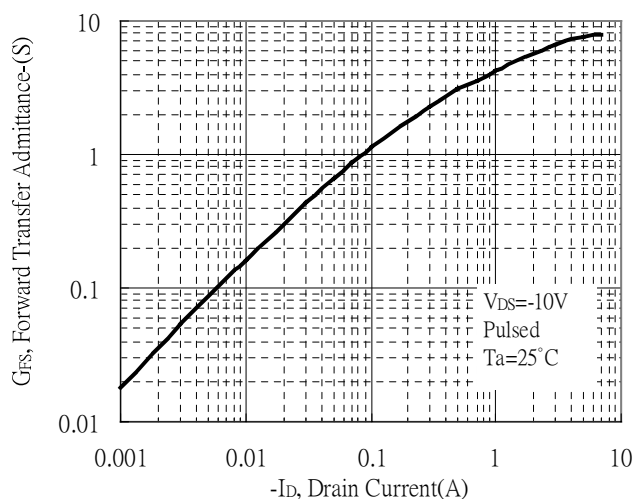
Capacitance vs Drain-to-Source Voltage



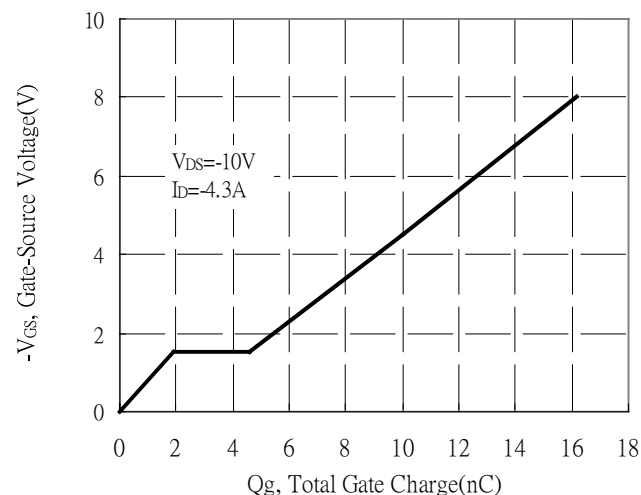
Threshold Voltage vs Junction Temperature



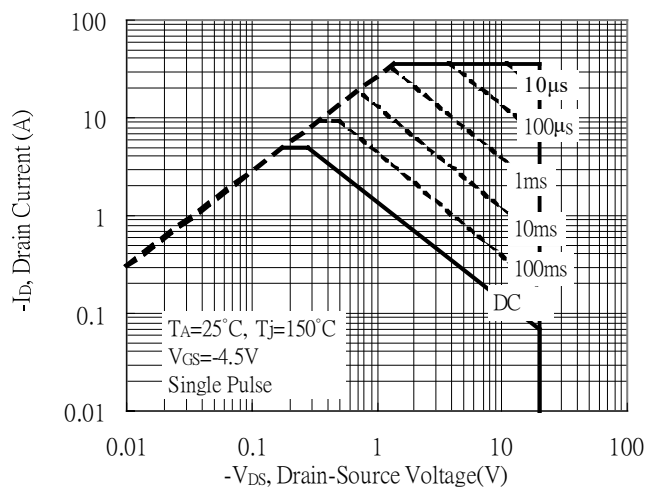
Forward Transfer Admittance vs Drain Current



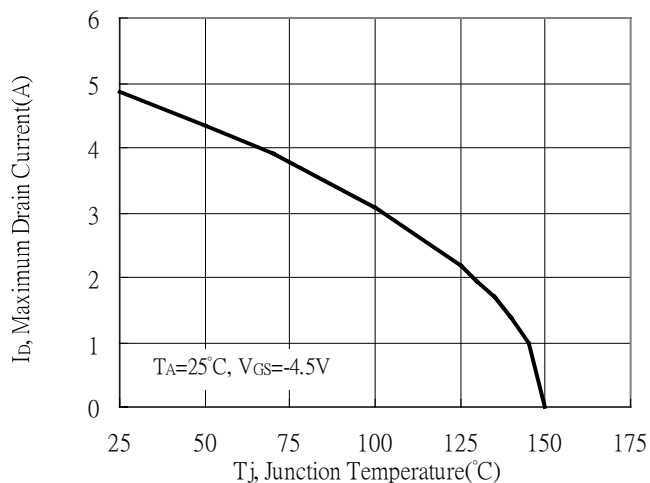
Gate Charge Characteristics



Maximum Safe Operating Area

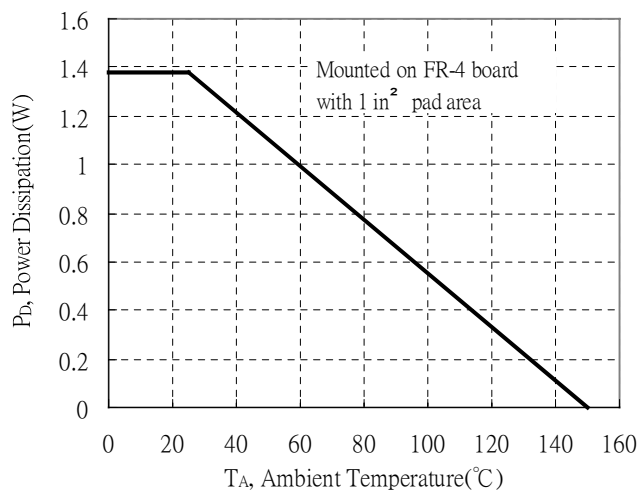


Maximum Drain Current vs Junction Temperature

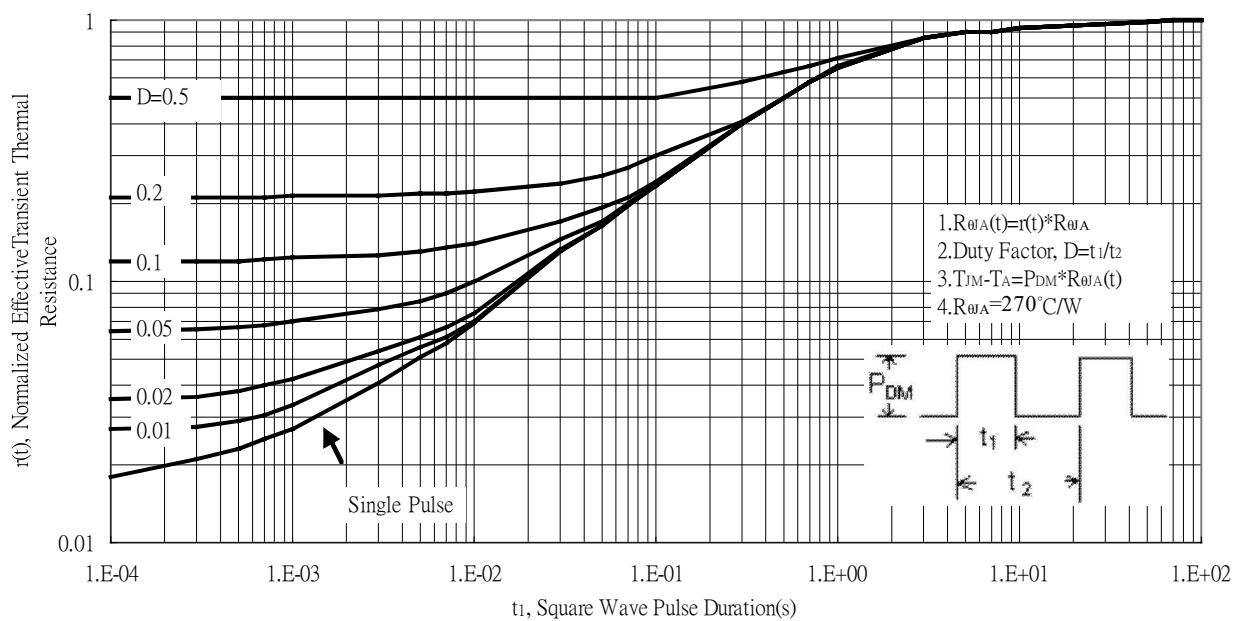


Typical Characteristics(Cont.)

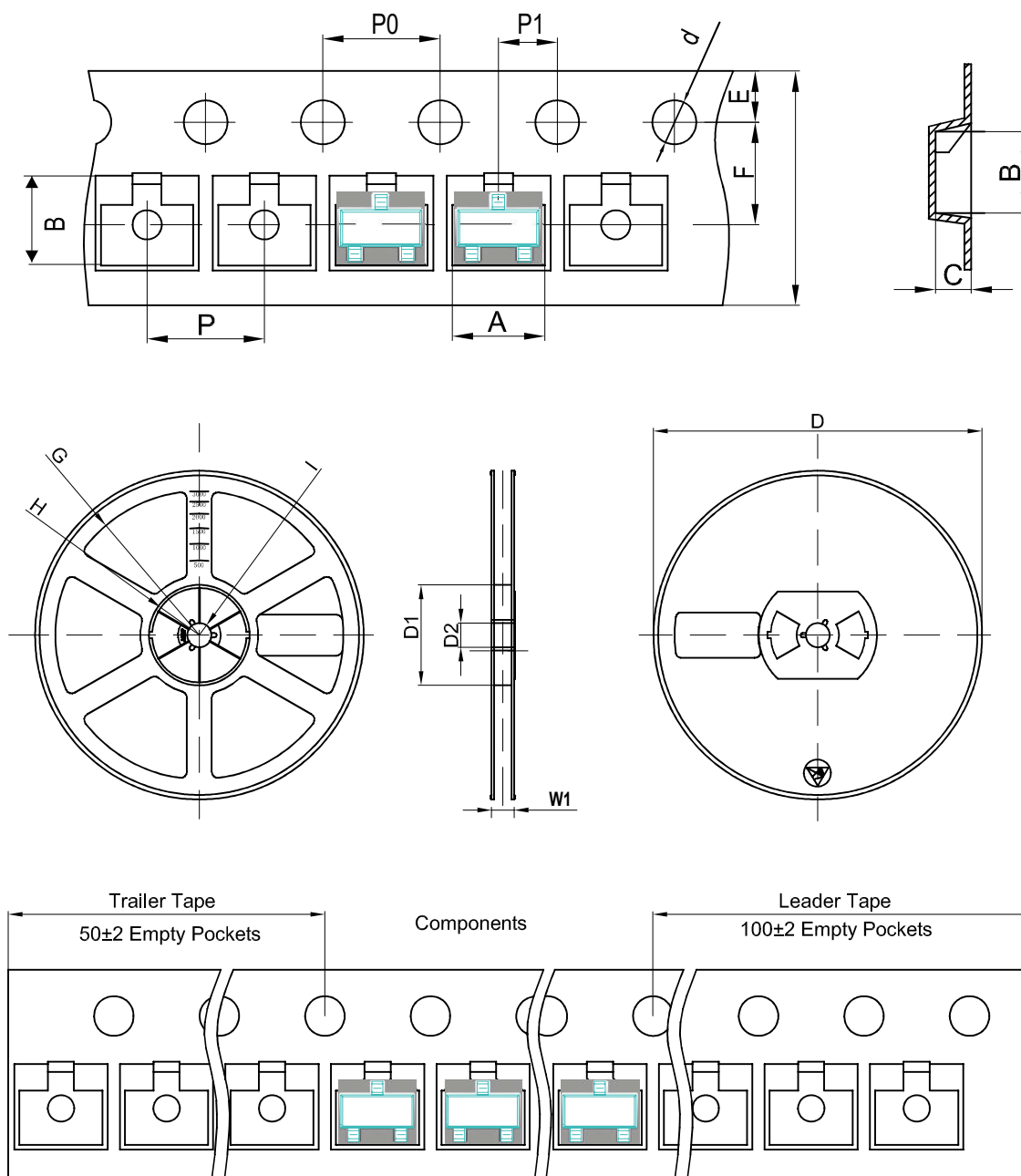
Power Derating Curve



Transient Thermal Response Curves



Reel Taping Specification



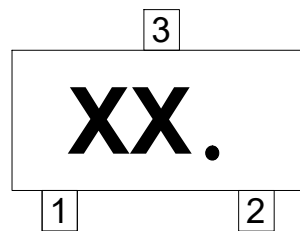
SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	$8.00 \pm 0.30 / - 0.10$	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.158 ± 0.004	0.158 ± 0.004	0.079 ± 0.004	$0.315 \pm 0.012 / - 0.004$	0.484 ± 0.039

Company reserves the right to improve product design , functions and reliability without notice.

Marking Code

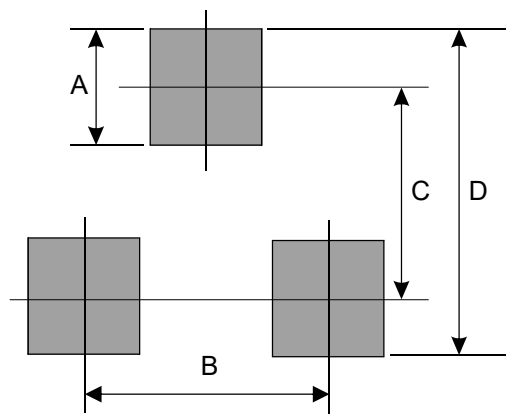
Part Number	Marking Code
CMSP3413T-HF	13



xx = Product type marking code

Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	1.90	0.075
C	2.02	0.080
D	2.82	0.111



Standard Packaging

Case Type	Qty Per Reel	Reel Size
	(Pcs)	(inch)
SOT-23	3,000	7