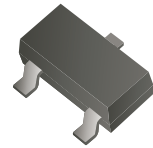


CMS0102-HF

**N-Channel
RoHS Device
Halogen Free**



Features

- $V_{DS}=100V$, $I_D=2A$.
 $R_{DS(ON)} < 240\ m\Omega$ @ $V_{GS}=10V$ (Typ: 210m Ω).
- High density cell design for ultra low R_{dson} .
- Fully characterized avalanche voltage and current.
- Excellent package for good heat dissipation.

Mechanical data

- Case: SOT-23, molded plastic.
- Mounting position: Any.

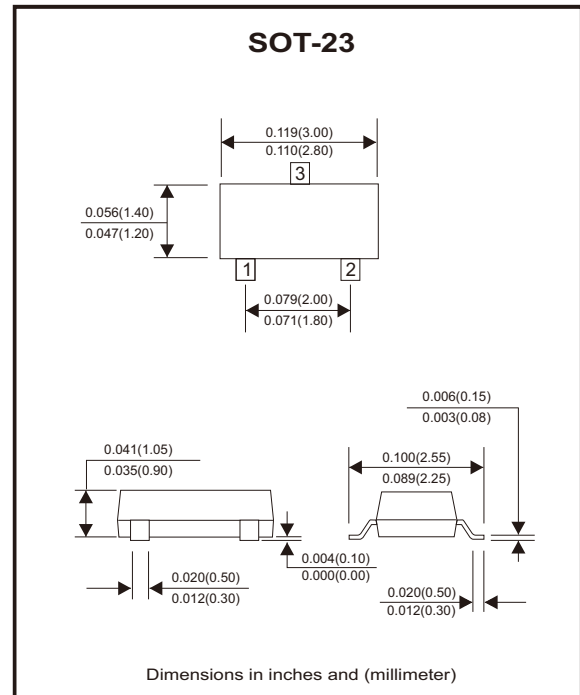
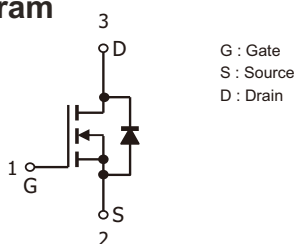
Description

The CMS0102 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Circuit Diagram



Maximum Ratings ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	V
Drain current-continuous	I_D	2	A
Drain current-pulsed (Note 1)	I_{DM}	5	A
Maximum power dissipation	P_D	1.25	W
Operating junction and storage temperature range	T_J, T_{STG}	-55 to 150	$^{\circ}C$

Thermal Characteristic

Thermal resistance, junction to ambient (Note 2)	$R_{\theta JA}$	100	$^{\circ}C/W$
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Electrical Characteristics (Ta=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100	110		V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics (Note 3)						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.8	2.5	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 1A$		210	240	m Ω
Forward transconductance	g_{FS}	$V_{DS} = 5V, I_D = 1A$	1			S
Dynamic Characteristics (Note 4)						
Input capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0, f = 1MHz$		190		pF
Output capacitance	C_{oss}			22		
Reverse transfer capacitance	C_{rss}			13		
Switching Characteristics (Note 4)						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 1.3A, R_L = 39\Omega, V_{GS} = 10V, R_G = 1\Omega$		6		nS
Turn-on rise time	t_r			10		
Turn-off delay time	$t_{d(off)}$			10		
Turn-off fall time	t_f			6		
Total gate charge	Q_g	$V_{DS} = 50V, I_D = 1.3A, V_{GS} = 10V$		5.2		nC
Gate-source charge	Q_{gs}			0.75		
Gate-drain charge	Q_{gd}			1.4		
Drain-Source Diode Characteristics						
Diode forward voltage (Note 3)	V_{SD}	$V_{GS} = 0V, I_S = 1.3A$			1.2	V
Diode forward current (Note 2)	I_S				2	A

- Notes: 1. Repetitive rating: Pulse width limited by maximum junction temperature.
 2. Surface mounted on FR4 board, $t \leq 10$ sec.
 3. Pulse test: Pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.
 4. Guaranteed by design, not subject to production.

Typical Electrical and Thermal Characteristics (Curves)

Fig.1 - Output Characteristics

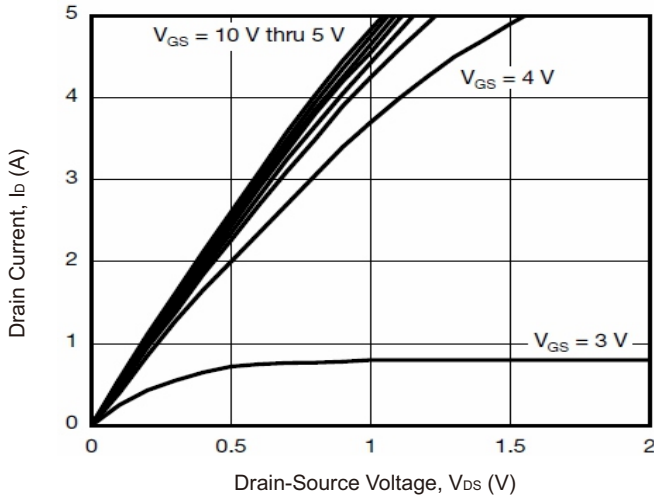


Fig.4 - $R_{DS(on)}$ -Junction Temperature

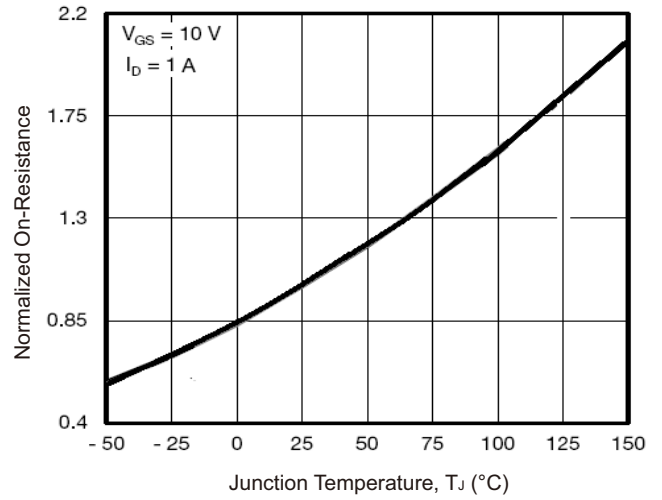


Fig.2 - Transfer Characteristics

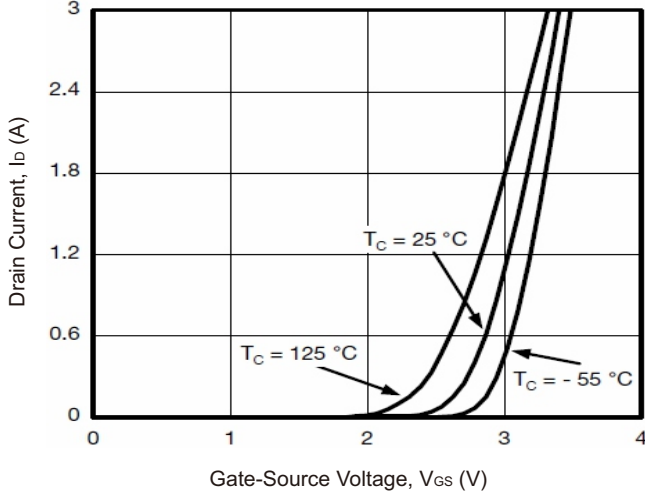


Fig.5 - Gate Charge

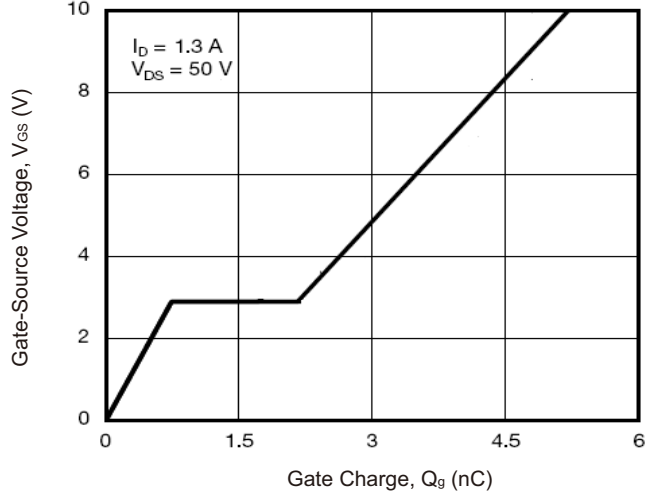


Fig.3 - $R_{DS(on)}$ -Drain Current

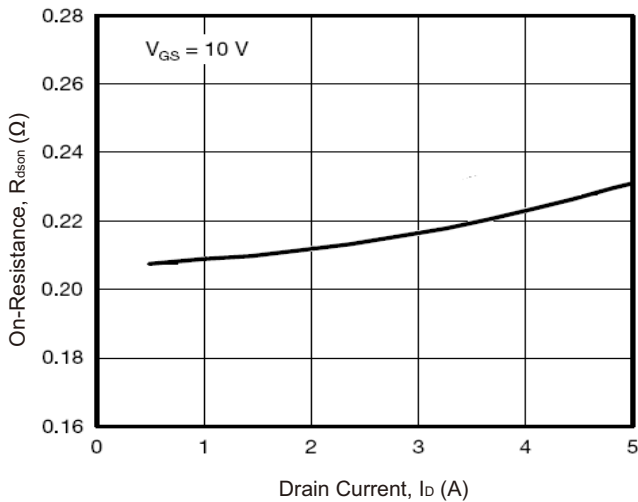
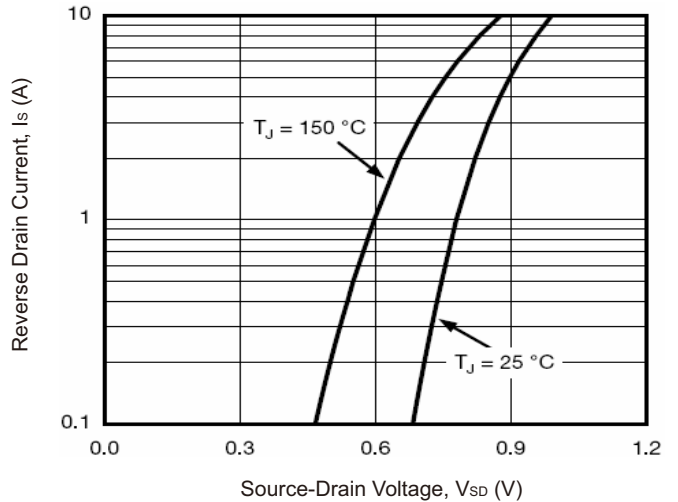


Fig.6 - Source-Drain Diode Forward



Typical Electrical and Thermal Characteristics (Curves)

Fig.7 - Capacitance vs V_{DS}

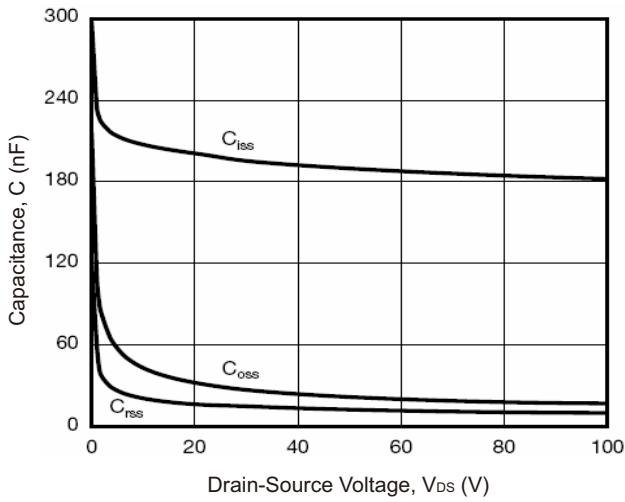


Fig.9 - BV_{DSS} vs Junction Temperature

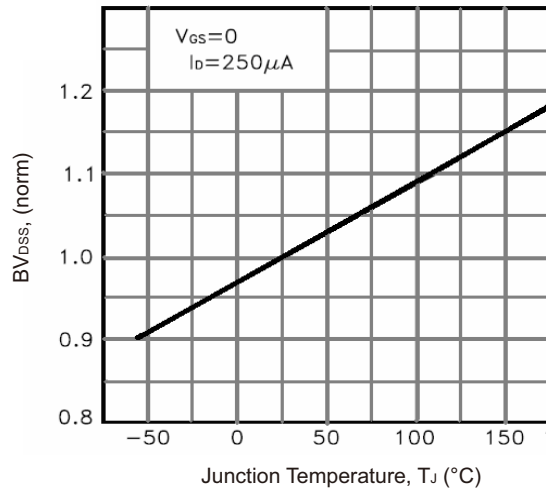


Fig.8 - Safe Operation Area

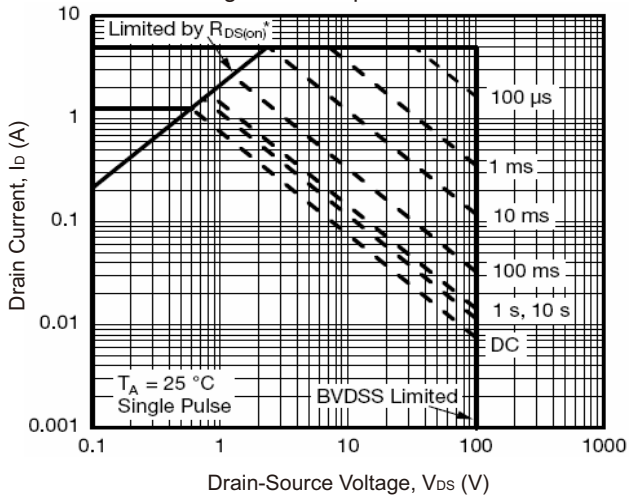


Fig.10 - Power Derating

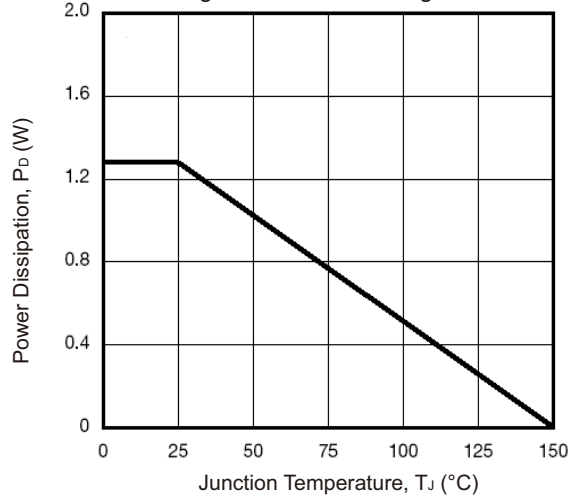
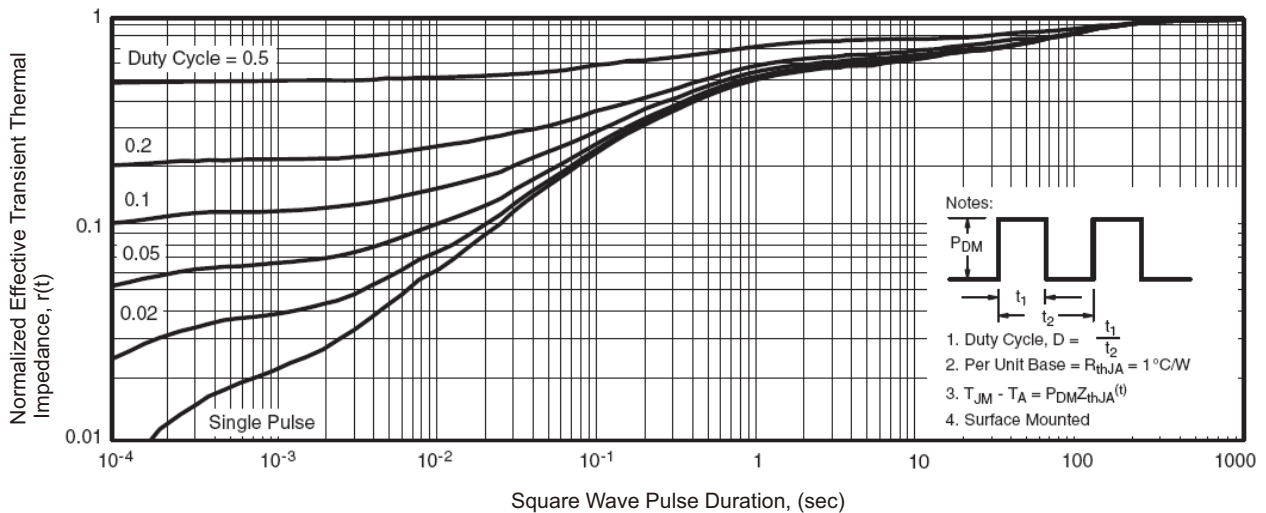
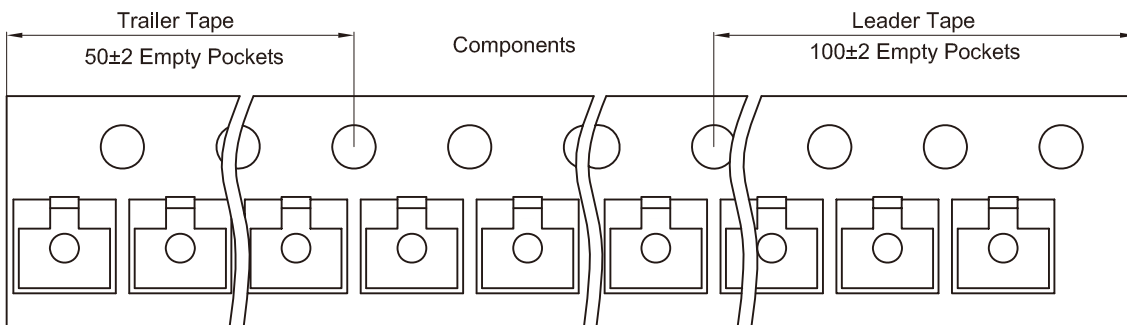
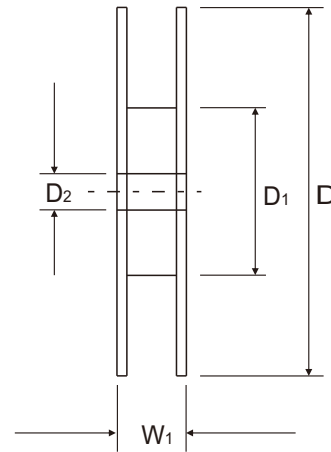
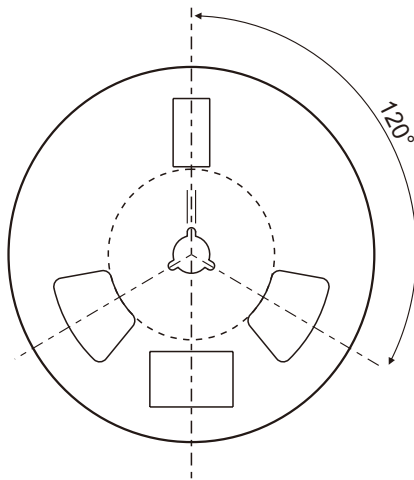
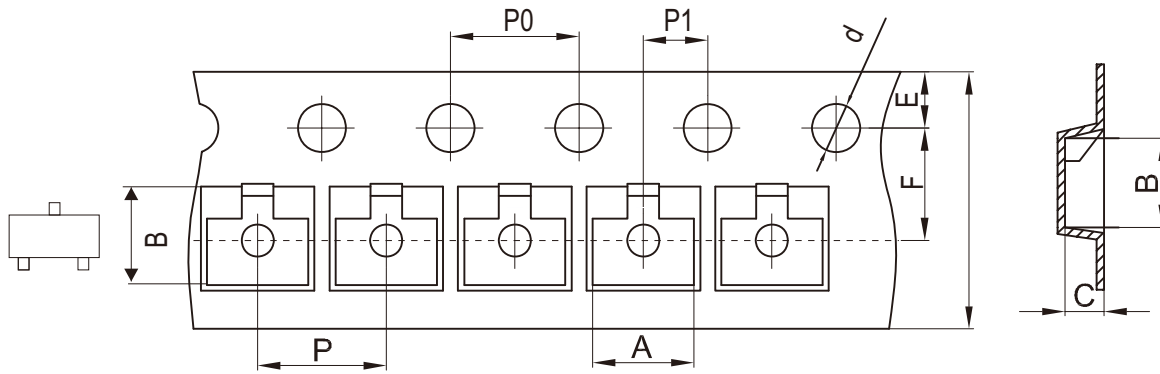


Fig.11 - Normalized Maximum Transient Thermal Impedance



Reel Taping Specification

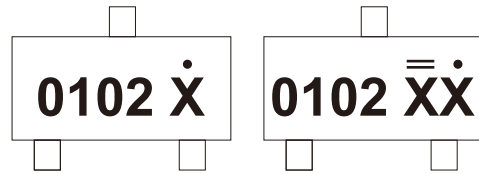


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

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 + 0.30 / - 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 + 0.012 / - 0.004	0.484 ± 0.039

Marking Code

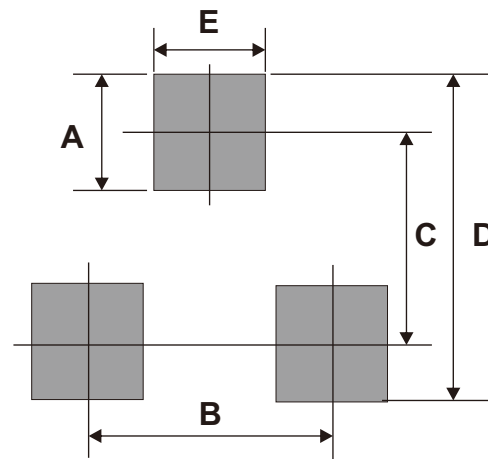
Part Number	Marking Code
CMS0102-HF	0102



$\dot{X} / \bar{\bar{X}} = \text{Control code}$

Suggested P.C.B. 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
E	0.60	0.024



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7