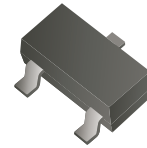


ACMSP3415T-HF

P-Channel

RoHS Device

Halogen Free



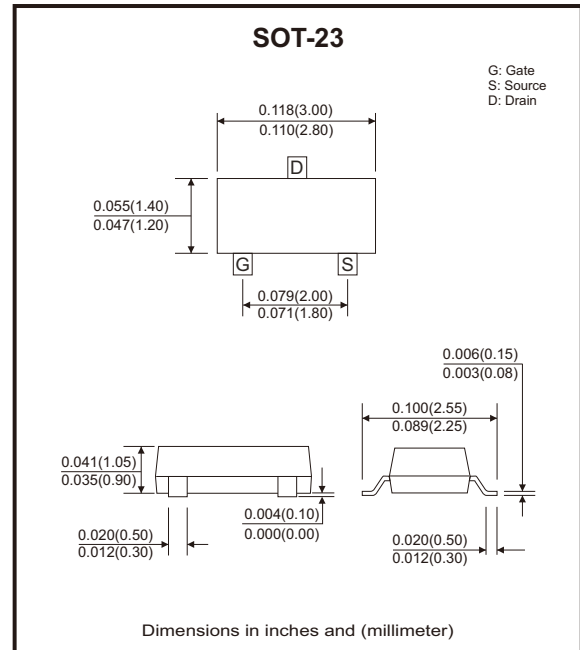
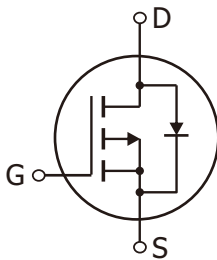
Features

- Advanced trench process technology.
- Low threshold voltage.
- Fast switching speed.
- AEC-Q101 Qualified.

Mechanical data

- Case: SOT-23, molded plastic.
- Terminals: Solderable per MIL-STD-750, method 2026.
- Mounting position: Any.

Circuit Diagram



Maximum Ratings (at TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	-20	V
Gate-source voltage	V_{GS}	± 12	V
Continuous drain current	I_D	-4	A
Pulsed drain current, pulsed (Note 1)	I_{DM}	-30	A
Power dissipation (Note 2)	P_D	1.25	W
Operating junction temperature range	T_J	-55 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

Thermal Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Thermal resistance junction to ambient (Note 3)	$R_{\theta JA}$			100	°C/W

Notes: 1. Pulse width $\leq 100\mu s$, duty cycle $\leq 1\%$, limited by T_J max.

2. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ C$, using $\leq 10s$ junction to ambient thermal resistance.

3. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ C$. The value in any given application depends on the user's specific board design.

Electrical Characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V, T _J = 25°C			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±12V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.7	-1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -4A		34	41	mΩ
	R _{DS(on)}	V _{GS} = -2.5V, I _D = -3A		42	53	mΩ
Dynamic Characteristics						
Gate resistance	R _G	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		13		Ω
Forward transconductance	g _{fs}	V _{DS} = -5V, I _D = -4A		20		S
Input capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -10V, f = 1MHz		751		pF
Output capacitance	C _{oss}			115		
Reverse transfer capacitance	C _{rss}			80		
Total gate charge	Q _g	V _{DS} = -10V, I _D = -4A, V _{GS} = -4.5V		9.3		nC
Gate to source charge	Q _{gs}			1		
Gate to drain charge	Q _{gd}			2.2		
Turn-on delay time	t _{d(on)}	V _{GS} = -4.5V, V _{DS} = -10V, R _L = 2.5Ω R _{GEN} = 3Ω		13		ns
Turn-on rise time	t _r			9		
Turn-off delay time	t _{d(off)}			19		
Turn-off fall time	t _f			29		
Body-Diode Parameters						
Diode forward voltage	V _{SD}	I _S = -1A, V _{GS} = 0V			-1	V
Reverse recovery time	t _{rr}	I _S = -4A, dI/dt = 500A/μs		26		ns
Reverse recovery charge	Q _{rr}			51		nC

Typical Rating and Characteristic Curves (ACMSP3415T-HF)

Fig.1 - On-Region Characteristics

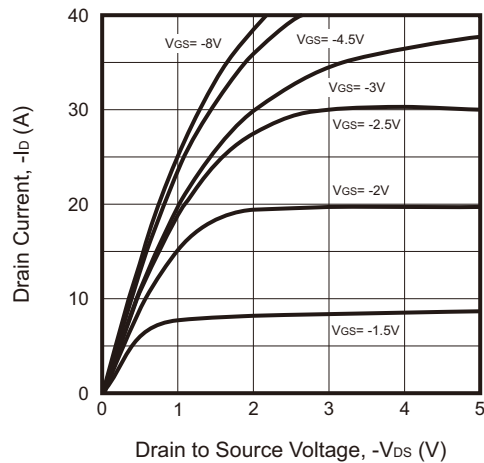


Fig.2 - Transfer Characteristics

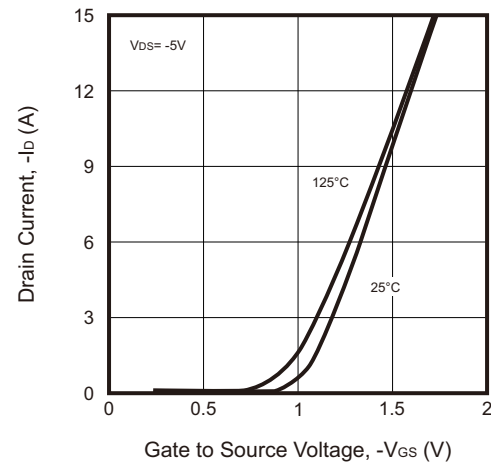


Fig.3 - $R_{DS(ON)}$ — I_D

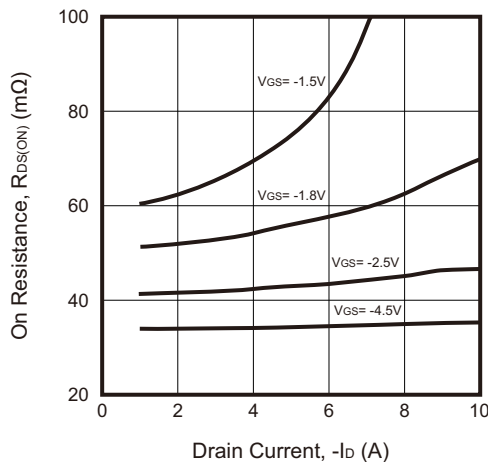


Fig.4 - On-Resistance vs. Junction Temperature

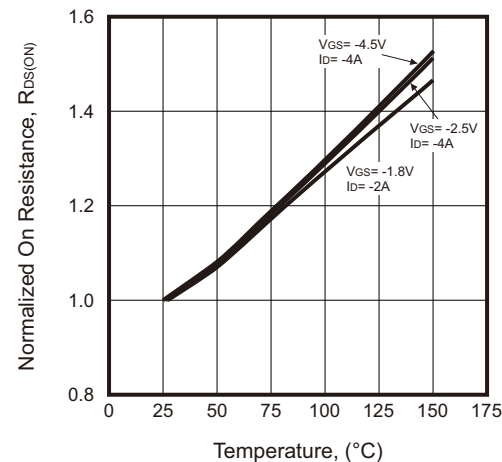


Fig.5 - On-Resistance vs. Gate to Source Voltage

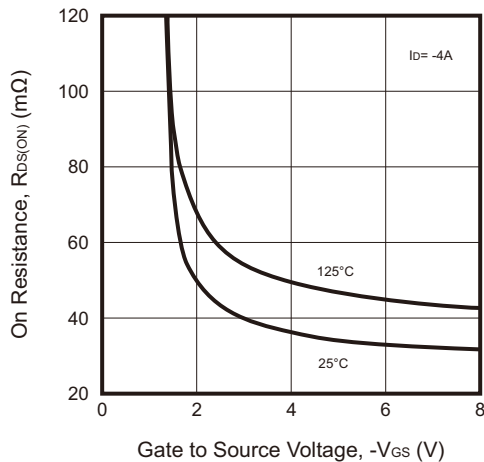
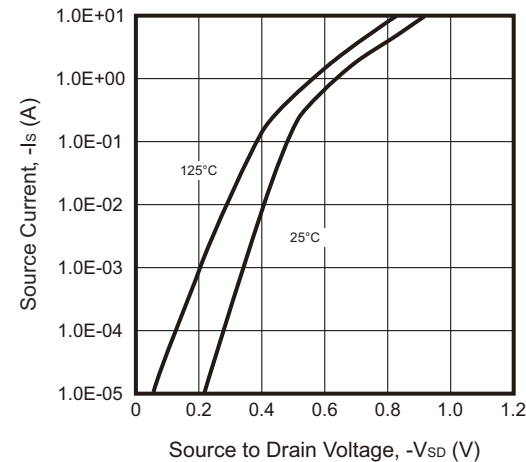


Fig.6 - Body-Diode Characteristics



Typical Rating and Characteristic Curves (ACMSP3415T-HF)

Fig.7 - Gate Charge Characteristics

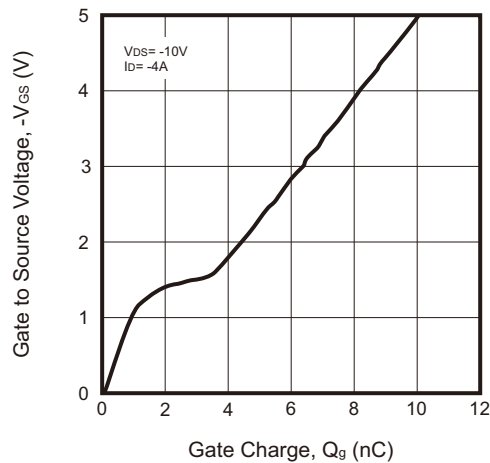


Fig.8 - Capacitance Characteristics

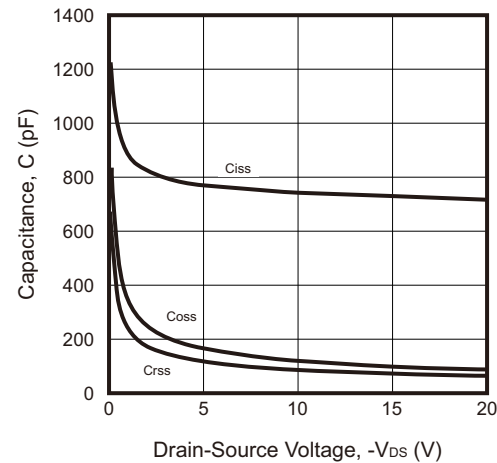


Fig.9 - Maximum Forward Biased Safe Operating Area

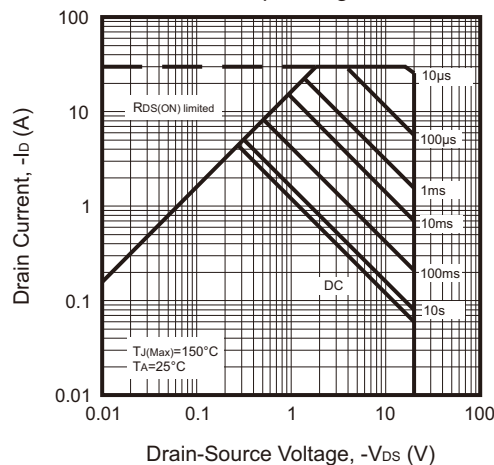
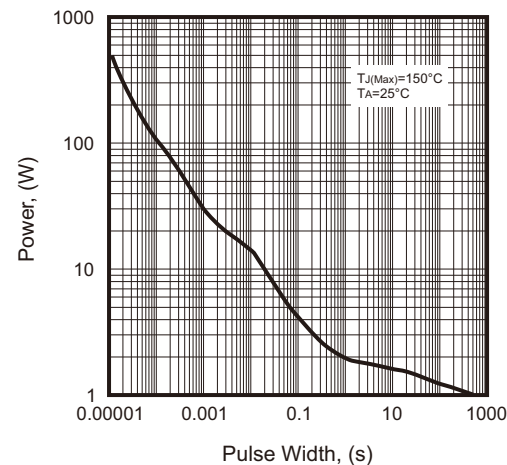
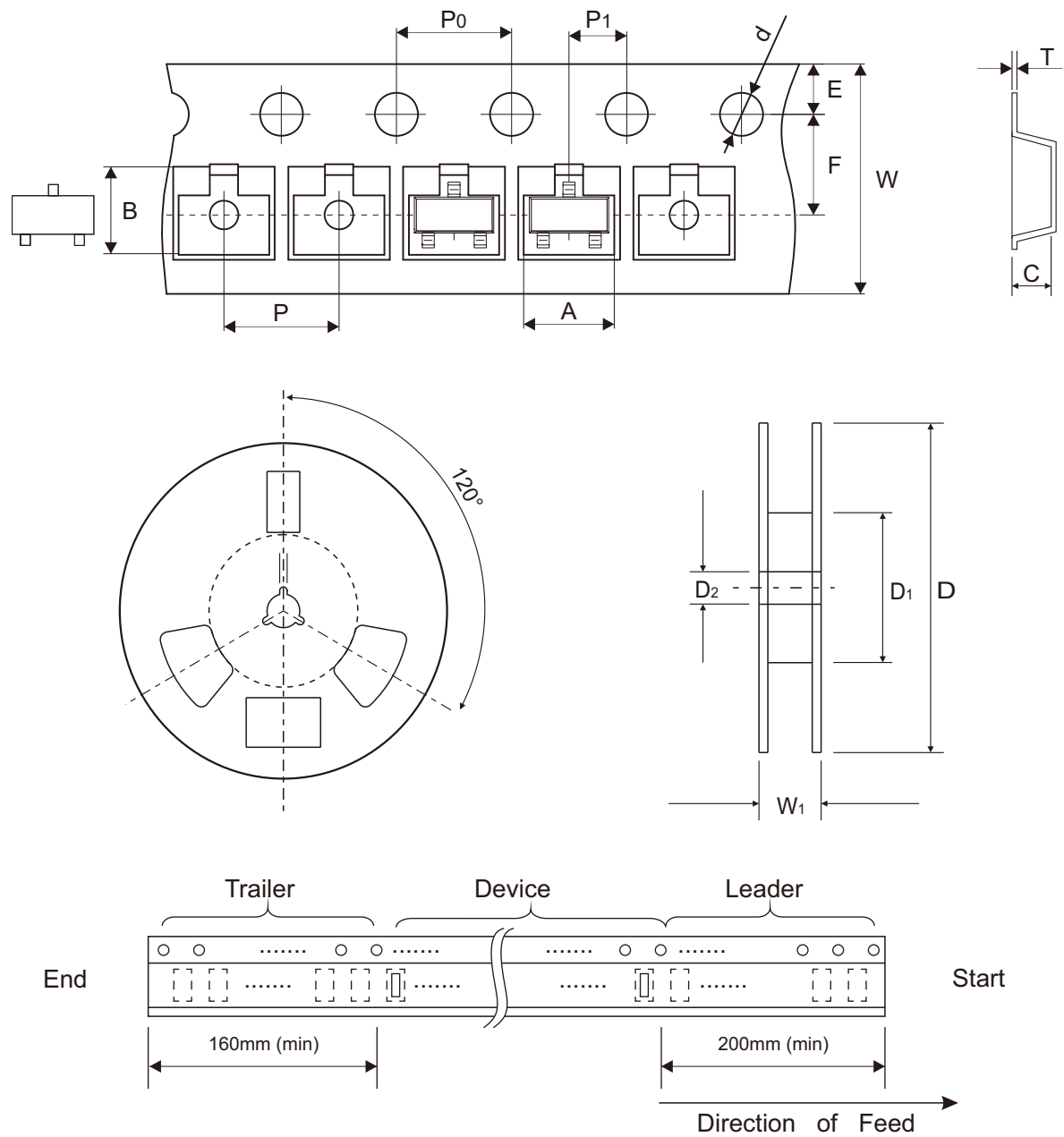


Fig.10 - Single Pulse Power Rating Junction to Ambient



Reel Taping Specification

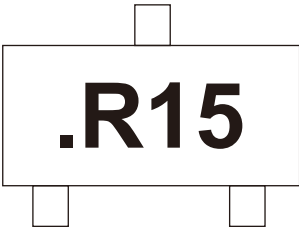


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.08 ± 0.10	2.72 ± 0.10	1.22 ± 0.10	1.50 + 0.10 - 0.00	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.121 ± 0.004	0.107 ± 0.004	0.048 ± 0.004	0.059 + 0.004 - 0.000	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.20 ± 0.05	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	0.008 ± 0.002	0.315 + 0.012 - 0.004	0.484 ± 0.039

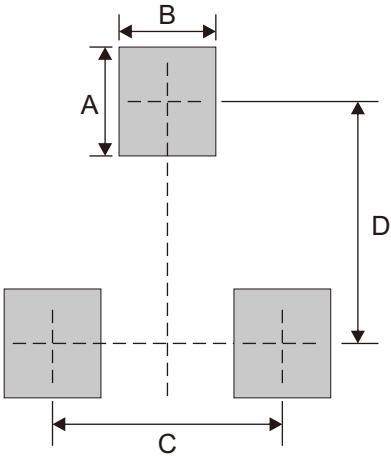
Marking Code

Part Number	Marking Code
ACMSP3415T-HF	.R15



Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	0.60	0.024
C	1.90	0.075
D	2.02	0.080



Standard Packaging

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