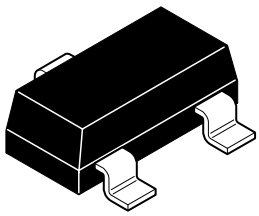
FMMT413
SOT23 NPN silicon planar avalanche transistor

Summary

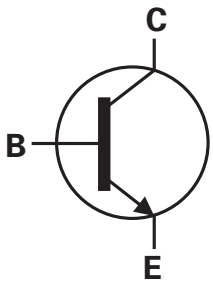


$V_{(BR)CES}$ = 150V, $V_{(BR)CEO}$ = 50V, I_{USB} = 25A

Description

The FMMT413 is a NPN silicon planar bipolar transistor optimized for avalanche mode operation. Tight process control and low inductance packaging combine to produce high current pulses with fast edges, ideal for laser diode driving.

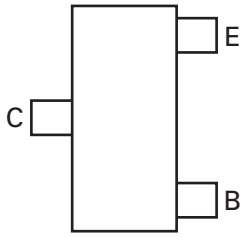
Features



- Avalanche mode operation
- 50A peak avalanche current
- Low inductance packaging

Applications

- Laser LED drivers
- Fast edge generation
- High speed pulse generators



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT413TD	7	8	500
FMMT413TA	7	8	3,000

Device marking

413

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	BV_{CBO}	150	V
Collector-emitter voltage	BV_{CEO}	50	V
Emitter-base voltage	BV_{EBO}	6	V
Peak pulse current (25ns Pulse Width)	I_{CM}	50	A
Continuous collector current	I_C	100	mA
Power dissipation at T_{amb} =25°C Linear derating factor	P_D	330	mW
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient	$R_{\Theta JA}$	378	°C/W

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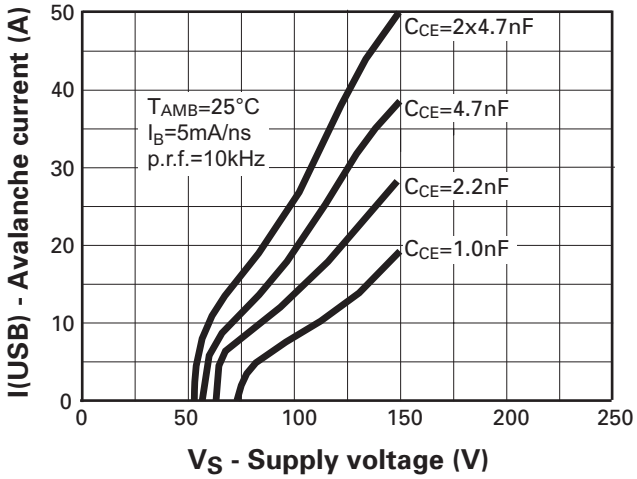
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	150			V	
Collector-emitter breakdown voltage	BV_{CES}	150			V	I_C = 100μA
Collector-emitter breakdown voltage	BV_{CEO}	50			V	I_C = 10mA
Emitter-base breakdown voltage	BV_{EBO}	6			V	I_E = 100μA
Collector cut-off current	I_{CBO}			100	nA	V_{CB} = 120V
Emitter cut-off current	I_{EBO}			100	nA	V_{EB} = 4V
Collector-emitter saturation voltage	$V_{CE(sat)}$			150	mV	I_C = 10mA, I_B = 1mA
Base-emitter saturation voltage	$V_{BE(sat)}$			800	mV	I_C = 10mA, I_B = 1mA
Current in second breakdown (pulsed)	I_{USB}	22 25			A A	V_C=110V, C_{CE}=4.7nF (*) V_C=130V, C_{CE}=4.7nF (*)
Static forward current transfer ratio	h_{FE}	50				I_C = 10mA, V_{CE} = 10V
Collector-emitter inductance	L_{ce}		2.5		nH	Standard SOT23 leads
Transition frequency	f_T		150		MHz	I_C = 10mA, V_{CE} = 5V, f = 20MHz
Output capacitance	C_{OBO}		2		pF	V_{CB} = 10V, I_E = 0, f = 1MHz

NOTES:
(*) Measured with a circuit possessing an approximate loop inductance of 12nH.

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Typical characteristics

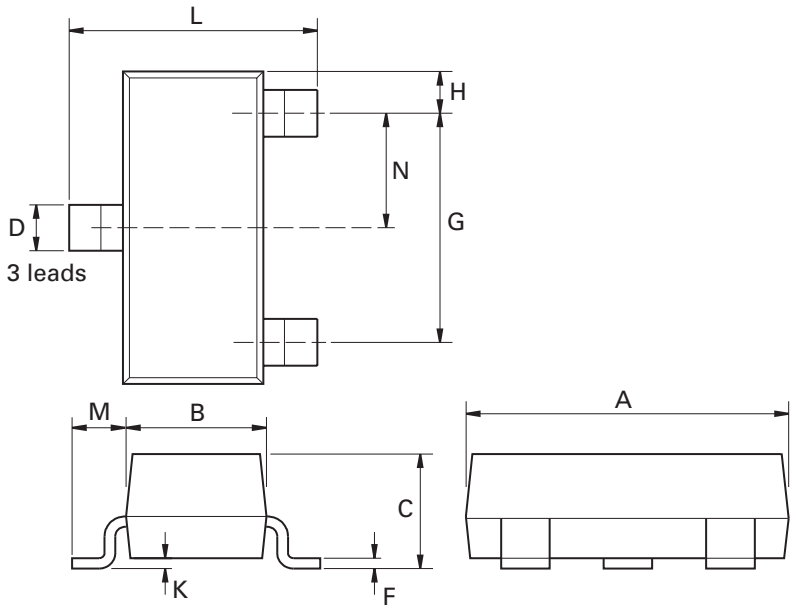


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Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	-	1.10	-	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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