

FMMT413

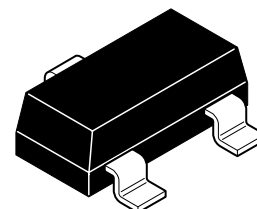
SOT23 NPN silicon planar avalanche transistor

Summary

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

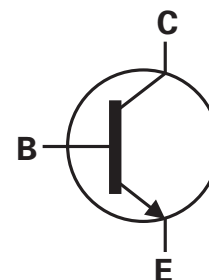
Description

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

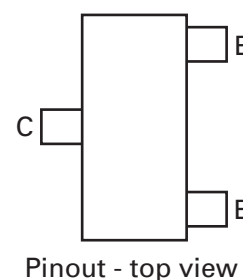


Applications

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

Ordering information

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



Device marking

413

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 $T_{amb}=25^{\circ}C$ Linear derating factor	P_D	330	mW
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	$^{\circ}C$

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient	$R_{\theta JA}$	378	$^{\circ}C/W$

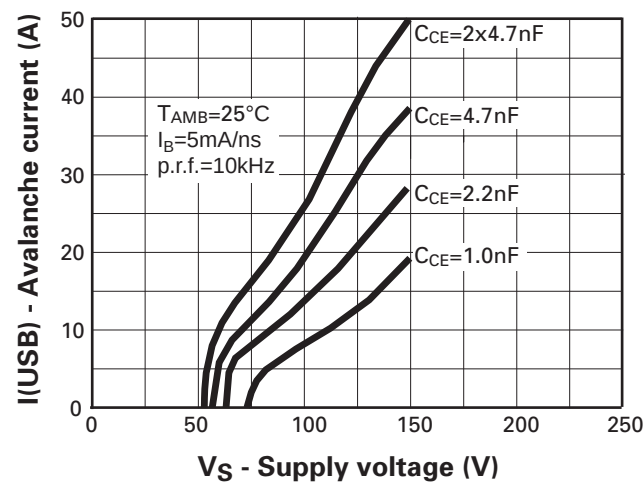
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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

NOTES:

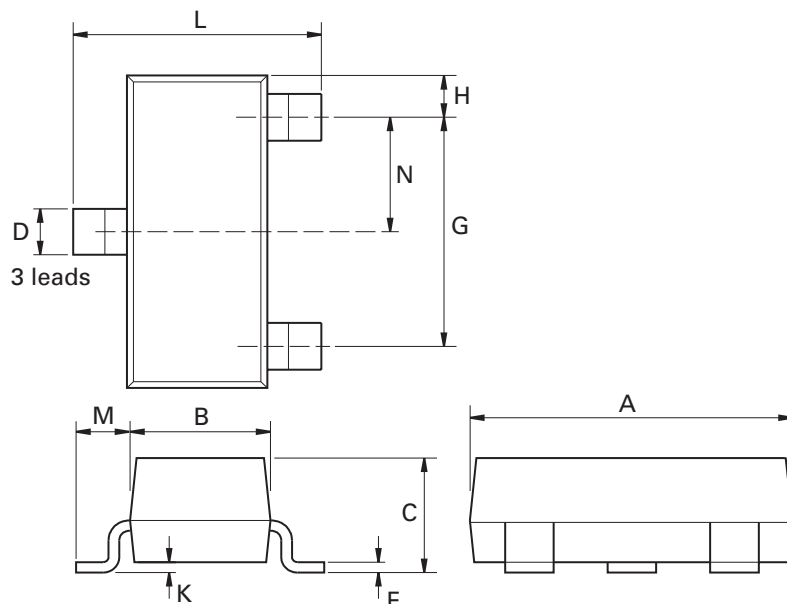
(*) Measured with a circuit possessing an approximate loop inductance of 12nH.

Typical characteristics



Intentionally left blank

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

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

For international sales offices visit www.zetex.com/offices

Zetex products are distributed worldwide. For details, see www.zetex.com/salesnetwork

This publication is issued to provide outline information only which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contact or be regarded as a representation relating to the products or services concerned. The company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.