

## N-CHANNEL SILICON POWER MOS-FET

### ■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

### ■ Applications

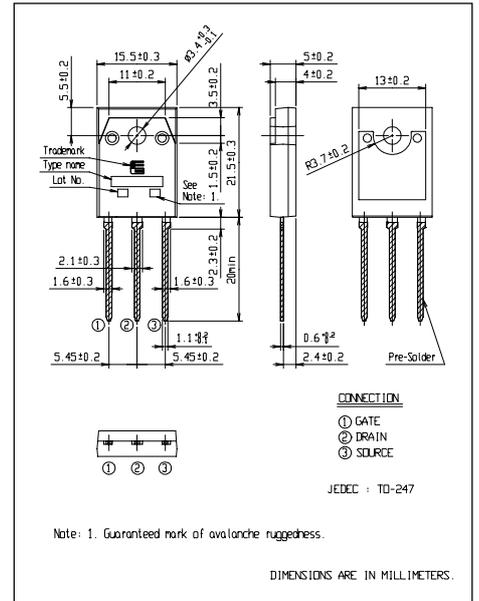
- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

### ■ Maximum ratings and characteristic Absolute maximum ratings

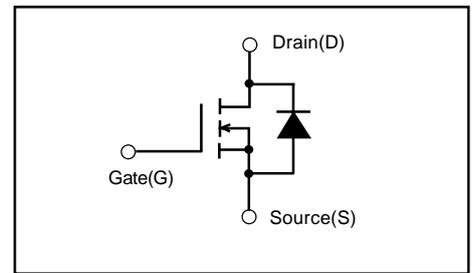
● (T<sub>c</sub>=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	500	V
Continuous drain current	I <sub>D</sub>	±20	A
Pulsed drain current	I <sub>D(puls)</sub>	±80	A
Gate-source voltage	V <sub>GS</sub>	±30	V
Repetitive or non-repetitive	IAR *2	20	A
Maximum Avalanche Energy	EAV *1	775	mJ
Max. power dissipation	P <sub>D</sub>	340	W
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C

\*1 L=3.56mH, V<sub>cc</sub>=50V \*2 T<sub>ch</sub> ≤ 150°C



### ■ Equivalent circuit schematic



### ● Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	500			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	2.5	3.0	3.5	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =500V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C	10	500	μA
			T <sub>ch</sub> =125°C	0.2	1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =10A V <sub>GS</sub> =10V		0.21	0.27	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =10A V <sub>DS</sub> =25V	9	18		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		3350	5025	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		480	720	pF
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		200	300	pF
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =300V I <sub>D</sub> =20A		27	40	ns
	t <sub>r</sub>	V <sub>GS</sub> =10V		100	150	
Turn-off time t <sub>off</sub>	td(off)	R <sub>GS</sub> =10Ω		250	375	ns
	t <sub>f</sub>			100	150	
Total gate charge	Q <sub>G</sub>	V <sub>CC</sub> =250V		155	235	nC
Gate-Source charge	Q <sub>GS</sub>	I <sub>D</sub> =20A		38	60	
Gate-Drain charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V		50	75	
Avalanche capability	I <sub>AV</sub>	L=3.56 mH T <sub>ch</sub> =25°C	20			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =2I <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.1	1.65	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V		600		ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		11.0		μC

### ● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			0.368	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			50.0	°C/W