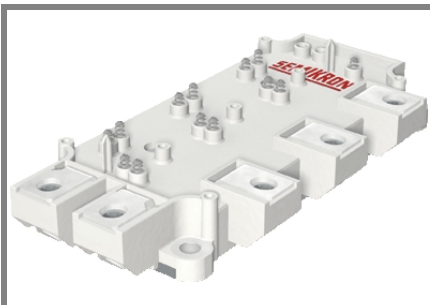


SEMiX 151GD128Ds



SEMiX® 13s

SPT IGBT Modules

SEMiX 151GD128Ds

Preliminary Data

Features

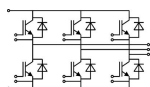
- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

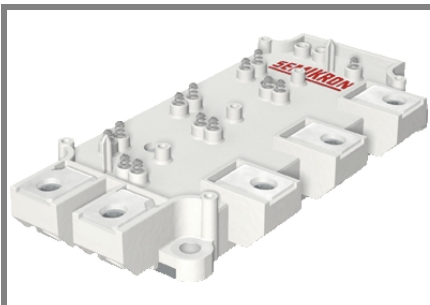
Absolute Maximum Ratings		$T_{case} = 25^{\circ}C$, unless otherwise specified			
Symbol	Conditions	Values			Units
IGBT					
V_{CES}	$T_j = 25^{\circ}C$	1200			V
I_C	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	150		A
		$T_{case} = 80^{\circ}C$	110		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	150			A
V_{GES}		± 20			V
t_{psc}	$V_{CC} = 600 V$; $V_{GE} \leq 20 V$; $T_j = 125^{\circ}C$ $V_{CES} < 1200 V$	10			μs
Inverse Diode					
I_F	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	120		A
		$T_{case} = 80^{\circ}C$	80		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150			A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 25^{\circ}C$	720		A
Module					
$I_{t(RMS)}$		600			A
T_{vj}		-40 ... +150			$^{\circ}C$
T_{stg}		-40 ... +125			$^{\circ}C$
V_{isol}	AC, 1 min.	4000			V

Characteristics		$T_{case} = 25^{\circ}C$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 3 mA$	4,5	5	6,5	V	
I_{CES}	$V_{GE} = 0 V$, $V_{CE} = V_{CES}$			0,3	mA	
V_{CE0}		$T_j = 25^{\circ}C$	1		1,15	V
		$T_j = 125^{\circ}C$	0,9		1,05	V
r_{CE}	$V_{GE} = 15 V$	$T_j = 25^{\circ}C$	12		16	$m\Omega$
		$T_j = 125^{\circ}C$	16		20	$m\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 75 A$, $V_{GE} = 15 V$	$T_j = 25^{\circ}C_{chiplev.}$	1,9		2,35	V
		$T_j = 125^{\circ}C_{chiplev.}$	2,1		2,55	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0 V$	6,9			nF	
C_{oes}		0,46			nF	
C_{res}		0,29			nF	
Q_G	$V_{GE} = -8 V \dots +15 V$	720			nC	
$t_{d(on)}$	$R_{Gon} = 5,5 \Omega$	$V_{CC} = 600V$ $I_{Cnom} = 75A$	200		ns	
t_r			33		ns	
E_{on}	$R_{Goff} = 5,5 \Omega$	$T_j = 125^{\circ}C$	7,9		mJ	
$t_{d(off)}$			330		ns	
t_f			44		ns	
E_{off}			7,9		mJ	
$R_{th(j-c)}$	per IGBT	0,19			K/W	



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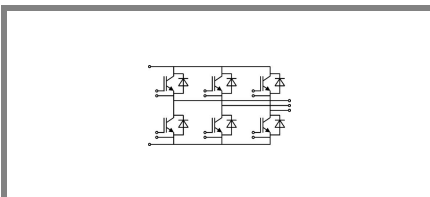
Preliminary Data

Features

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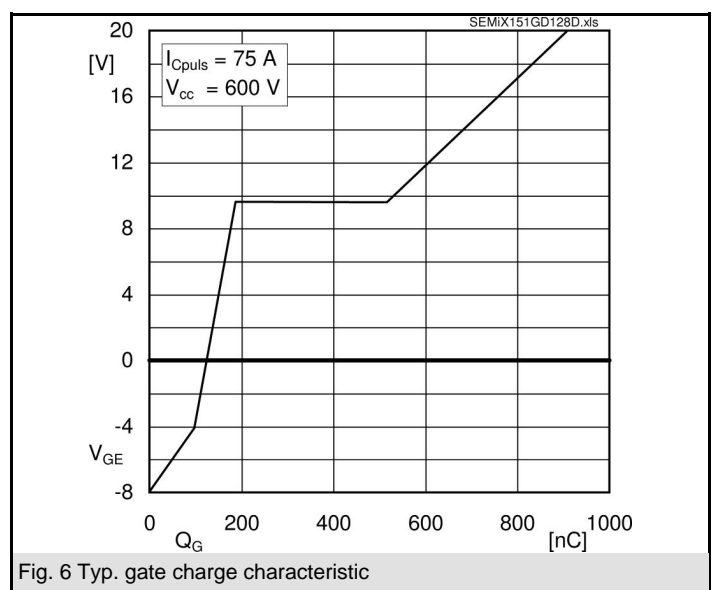
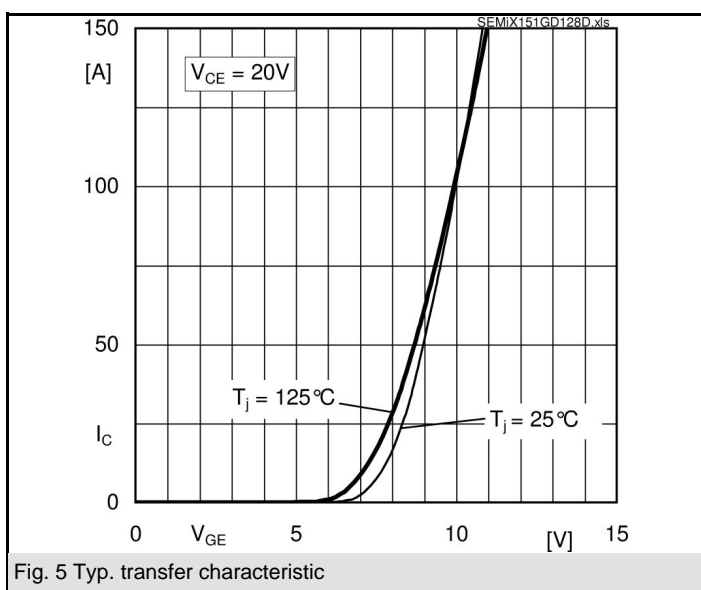
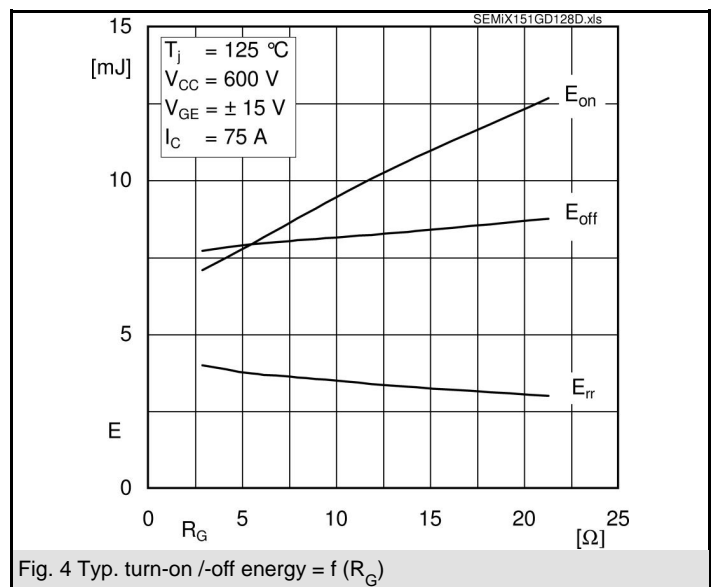
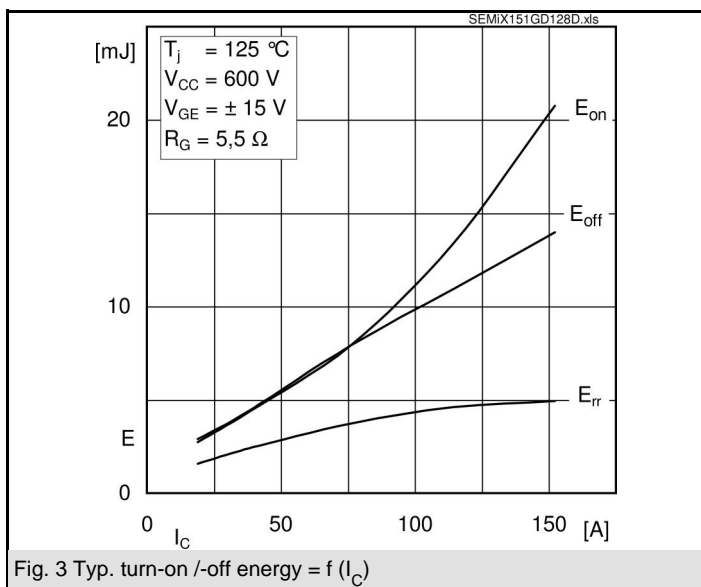
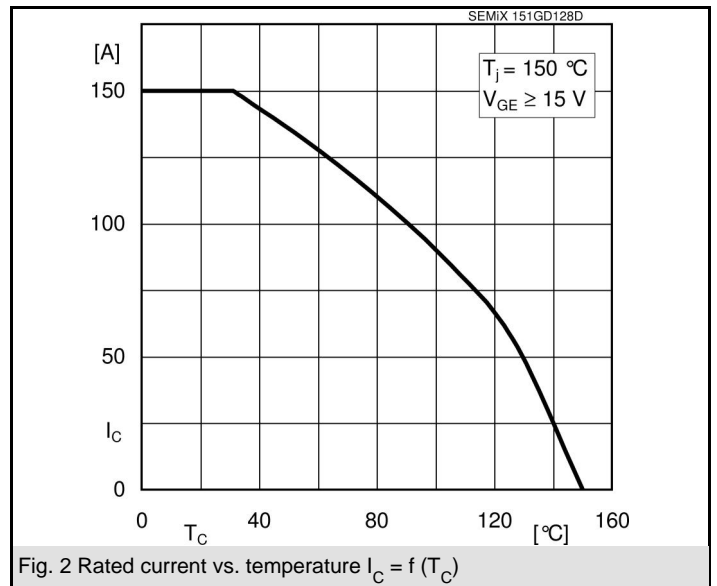
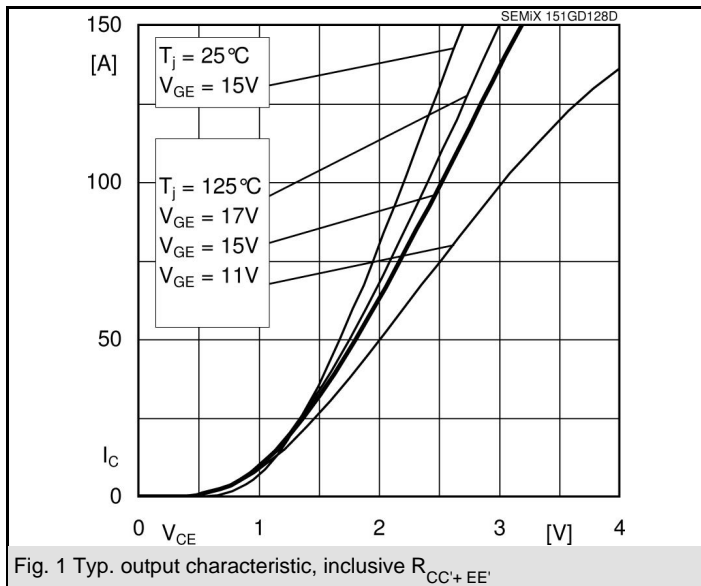


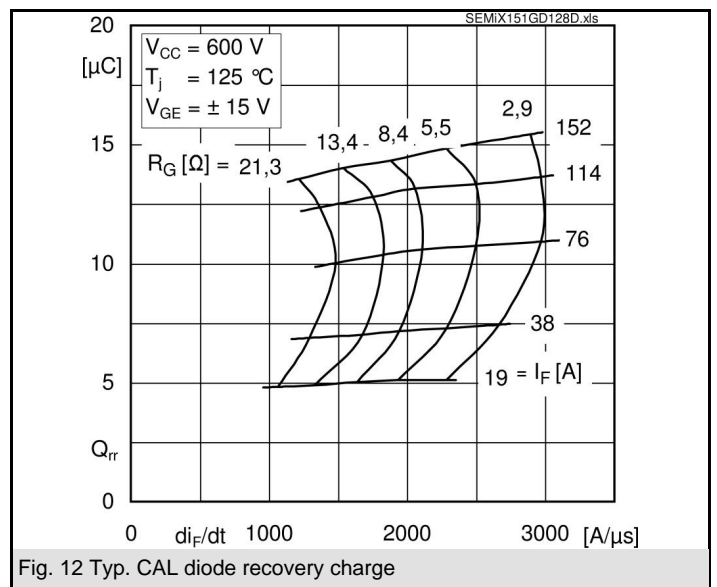
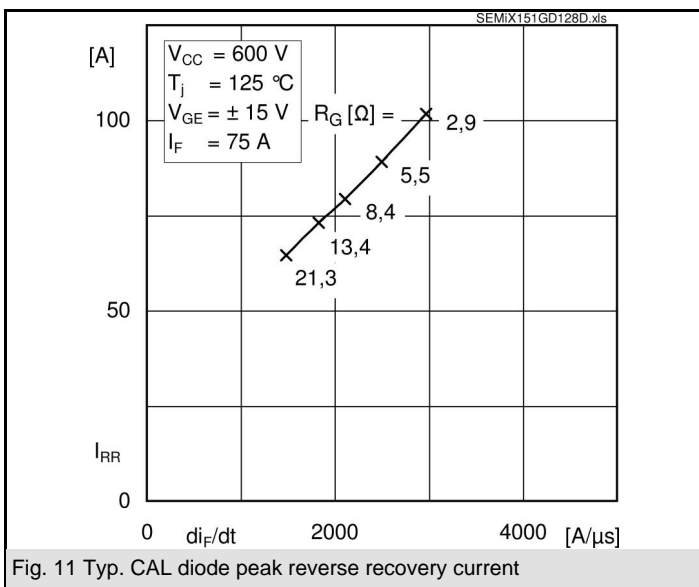
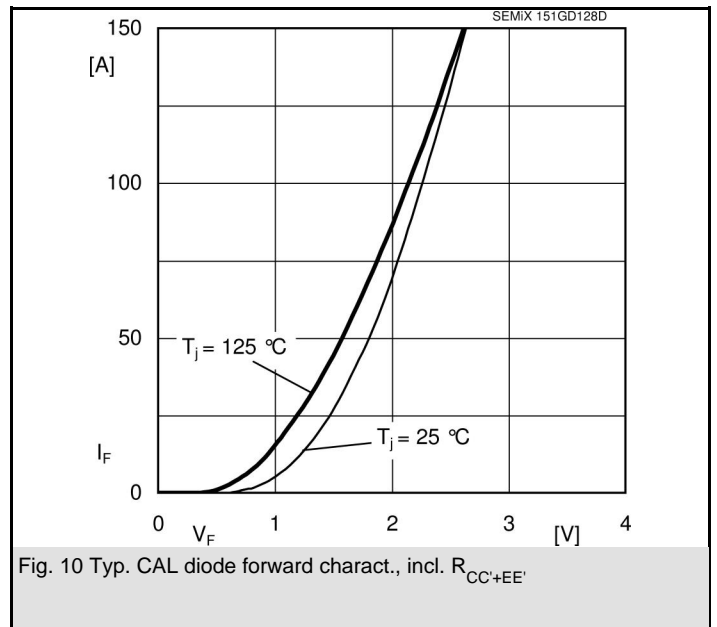
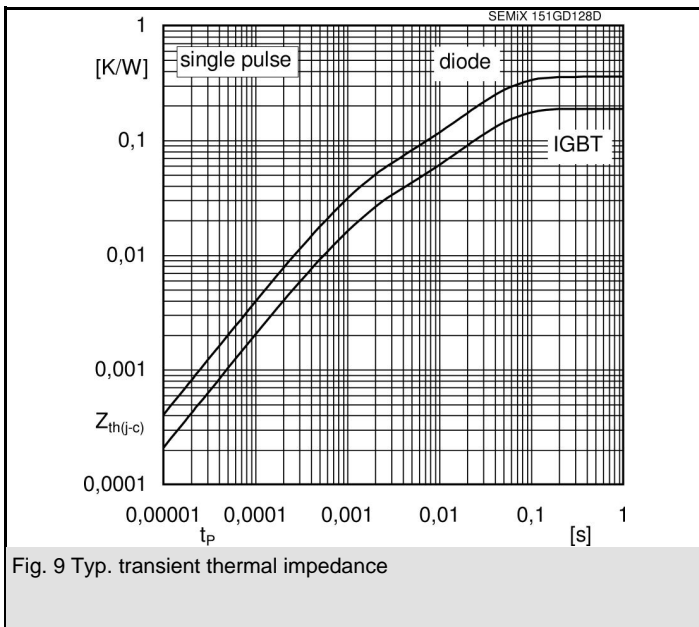
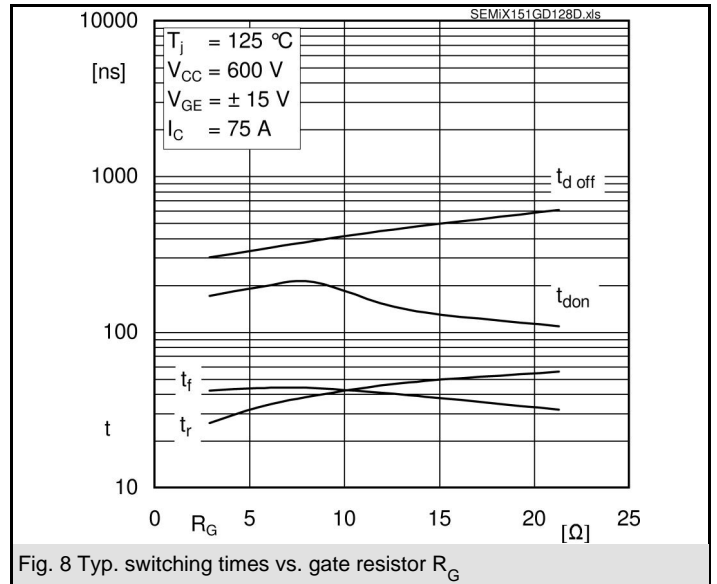
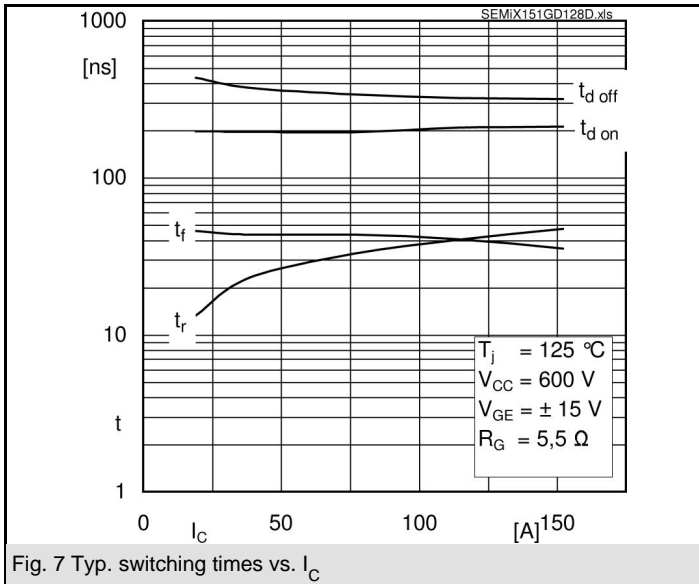
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Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$				
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8	2,3	V
V_{F0}			1,1	1,45	V
	$T_j = 25 \text{ }^\circ\text{C}$				
	$T_j = 125 \text{ }^\circ\text{C}$		0,85	1,2	V
r_F			12	14	mΩ
	$T_j = 25 \text{ }^\circ\text{C}$				
	$T_j = 125 \text{ }^\circ\text{C}$		12,7	14,7	mΩ
I_{RRM}	$I_{Fnom} = 75 \text{ A}$		90		A
Q_{rr}	$di/dt = 2500 \text{ A}/\mu\text{s}$		11		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		3,5		mJ
$R_{th(j-c)D}$	per diode			0,36	K/W
Module					
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$	0,7		mΩ
		$T_{case} = 125 \text{ }^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,04		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				350	g
Temperature sensor					
R_{100}	$T_c = 100 \text{ }^\circ\text{C}$ ($R_{25} = 5 \text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$; $T[\text{K}]; B$		3550±2%		K

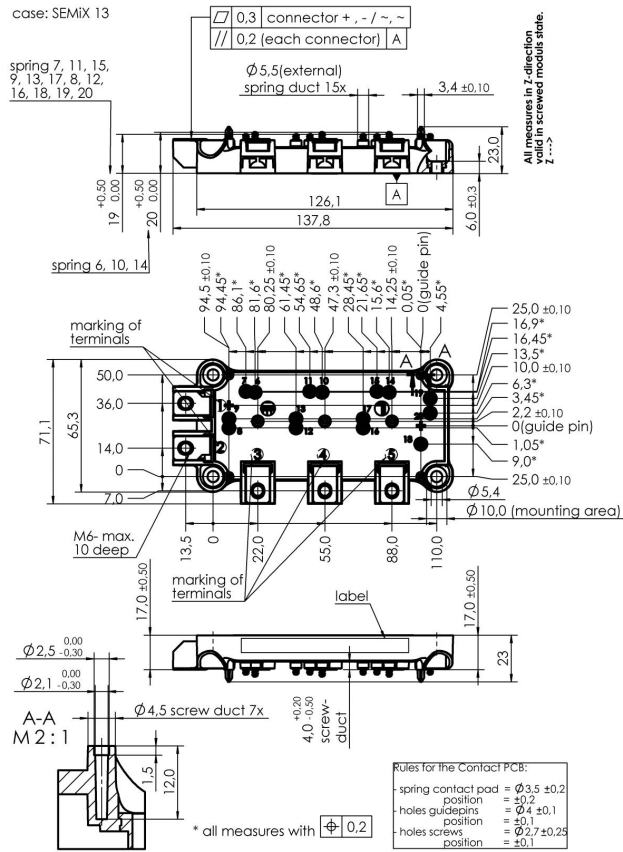
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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Case SEMiX 13s

