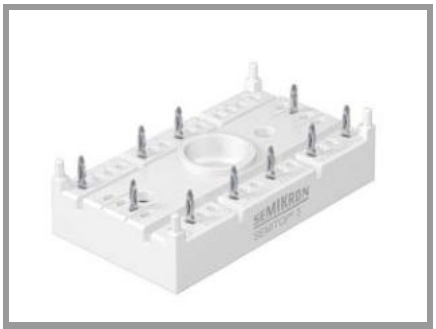
SK25GD12F4ETp



SEMITOP® 3 Press-Fit

Sixpack Open Emitter

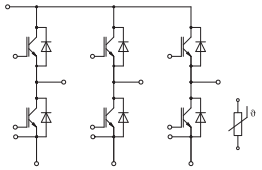
SK25GD12F4ETp

Features*

- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMITOP® Press-Fit types
- Trench4 IGBT technology
- CAL4F technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications

- Motor drives
- Servo drives
- Air conditioning
- Auxiliary Inverters
- UPS



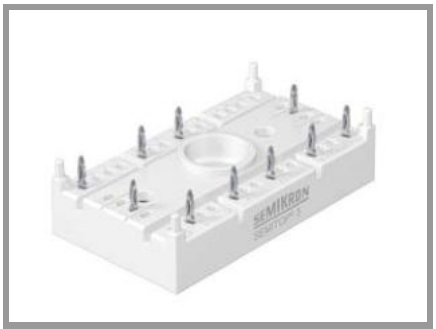
GD-ET

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	P12 T_j = 175 °C	T_s = 25 °C	32	A
		T_s = 70 °C	26	A
I_C	HPTP T_j = 175 °C	T_s = 25 °C	37	A
		T_s = 70 °C	30	A
I_{Cnom}			25	A
I_{CRM}			75	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 800 V $V_{GE} \leq$ 15 V $V_{CES} \leq$ 1200 V	T_j = 150 °C	10	µs
T_j			-40 ... 175	°C
Inverse - Diode				
V_{RRM}	T_j = 25 °C		1200	V
I_F	P12 T_j = 175 °C	T_s = 25 °C	23	A
		T_s = 70 °C	19	A
I_F	HPTP T_j = 175 °C	T_s = 25 °C	25	A
		T_s = 70 °C	20	A
I_{FRM}			30	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j = 150 °C		65	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	, $\Delta T_{terminal}$ at PCB joint = 30 K, per pin		35	A
T_{stg}	module without TIM		-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min		2500	V

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Inverter - IGBT						
$V_{CE(sat)}$	I_C = 25 A V_{GE} = 15 V chiplevel	T_j = 25 °C		2.05	2.42	V
		T_j = 150 °C		2.59	2.96	V
V_{CE0}	chiplevel	T_j = 25 °C		1.10	1.28	V
		T_j = 150 °C		0.95	1.13	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		38	46	mΩ
		T_j = 150 °C		66	73	mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C = 0.85 mA		5.2	5.8	6.4	V
I_{CES}	V_{GE} = 0 V, V_{CE} = 1200 V, T_j = 25 °C				1	mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		1.43		nF
C_{oes}		f = 1 MHz		-		nF
C_{res}		f = 1 MHz		0.09		nF
Q_G	V_{GE} = - 15 V...+ 15 V			201		nC
R_{Gint}	T_j = 25 °C			0		Ω
$t_{d(on)}$	V_{CC} = 600 V I_C = 25 A $R_{G\ on}$ = 8.2 Ω $R_{G\ off}$ = 8.2 Ω di/dt_{on} = 1100 A/µs di/dt_{off} = 330 A/µs dv/dt = 5029 V/µs V_{GE} = +15/-15 V	T_j = 150 °C		9		ns
t_r		T_j = 150 °C		18.1		ns
E_{on}		T_j = 150 °C		1.6		mJ
$t_{d(off)}$		T_j = 150 °C		223		ns
t_f		T_j = 150 °C		60		ns
E_{off}		T_j = 150 °C		1.76		mJ
$R_{th(j-s)}$	per IGBT, P12 (Reference)			1.26		K/W
$R_{th(j-s)}$	per IGBT, HPTP			1		K/W



SEMITOP® 3 Press-Fit

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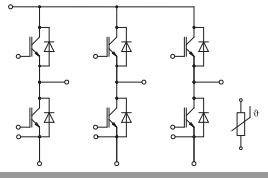

GD-ET

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse - Diode						
$V_F = V_{EC}$	I_F = 15 A	T_j = 25 °C		2.38	2.71	V
	chiplevel	T_j = 150 °C		2.44	2.77	V
V_{F0}	chiplevel	T_j = 25 °C		1.30	1.50	V
		T_j = 150 °C		0.90	1.10	V
r_F	chiplevel	T_j = 25 °C		72	81	mΩ
		T_j = 150 °C		103	111	mΩ
I_{RRM}	I_F = 25 A V_{GE} = -15 V V_{CC} = 600 V di/dt$_{off}$ = 1100 A/µs	T_j = 150 °C		18.8		A
Q_{rr}		T_j = 150 °C		4.1		µC
E_{rr}		T_j = 150 °C		1.6		mJ
$R_{th(j-s)}$	per Diode, P12 (Reference)			1.89		K/W
$R_{th(j-s)}$	per Diode, HPTP			1.66		K/W
Module						
L_{CE}				-		nH
M_s	to heatsink		2.25		2.5	Nm
w				30		g

Characteristics					
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
Temperature Sensor					
R_{100}	T_c=100°C (R_{25}=5 kΩ)		493 ± 5%		Ω
$B_{25/85}$	$R_{(T)}=R_{25}*\exp[B_{25/85}*(1/T-1/298)]$, T[K]		3420		K

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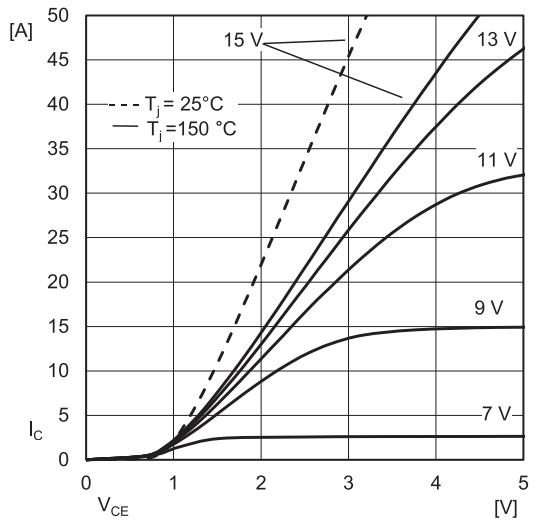

Fig. 1: Typ. IGBT output characteristic, incl. $R_{CC+ EE'}$

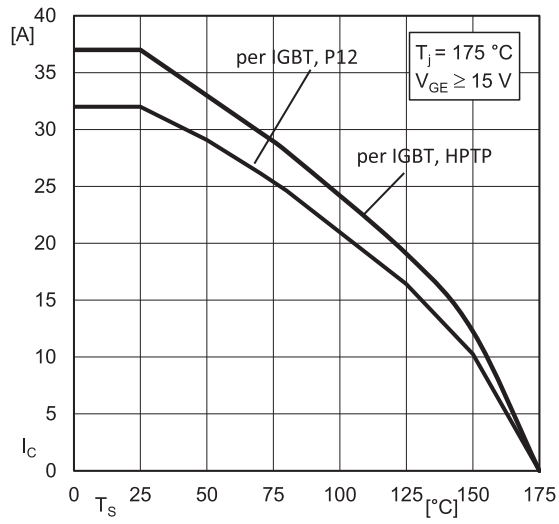

Fig. 2: IGBT rated current vs. Temperature $I_c=f(T_s)$

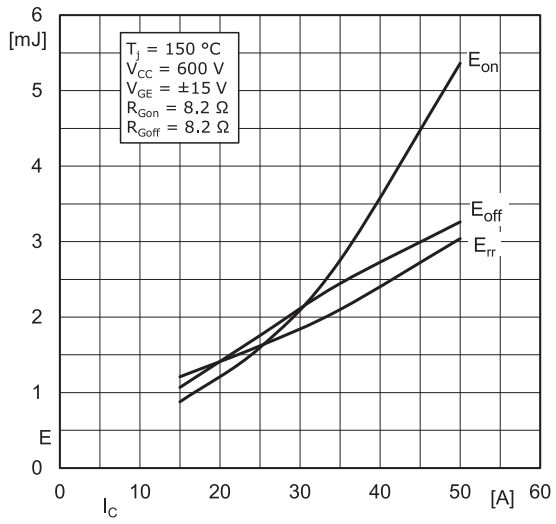

Fig. 3: Typ. turn-on /-off energy = f (I_C)

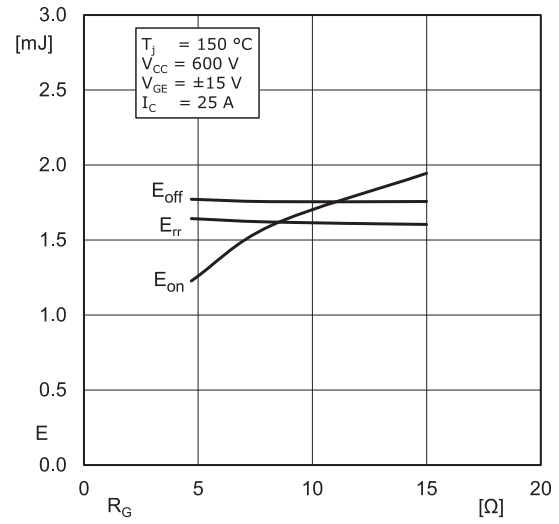

Fig. 4: Typ. turn-on /-off energy = f (R_G)

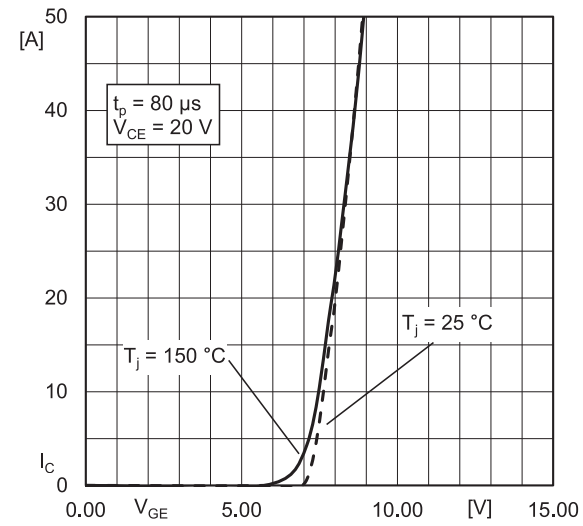

Fig. 5: Typ. IGBT transfer characteristic

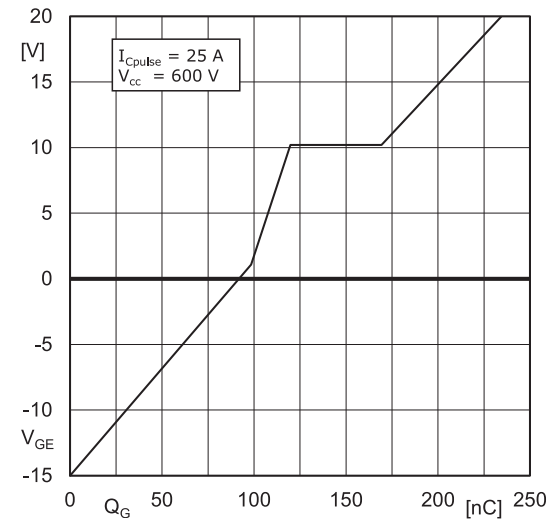

Fig. 6: Typ. IGBT gate charge characteristic

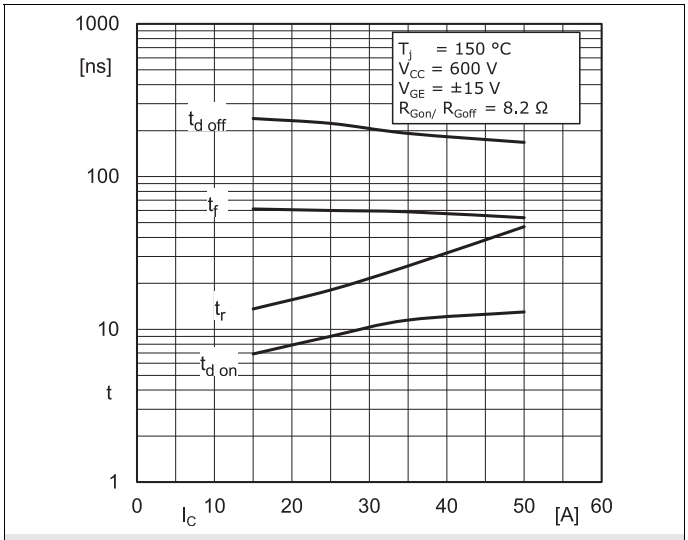

Fig. 7: Typ. switching times = f (I_C)

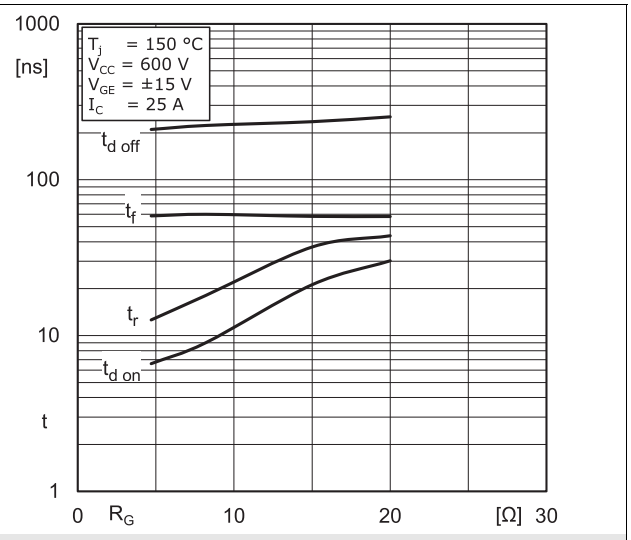

Fig. 8: Typ. switching times = f (R_G)

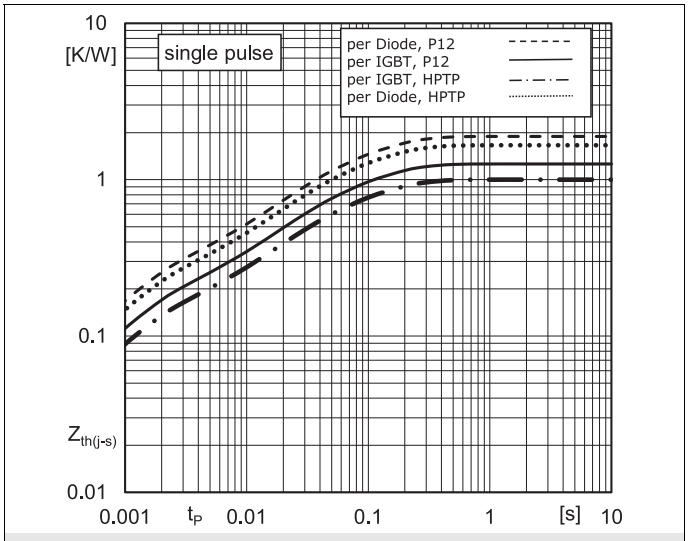

Fig. 9: Typ. transient thermal impedance

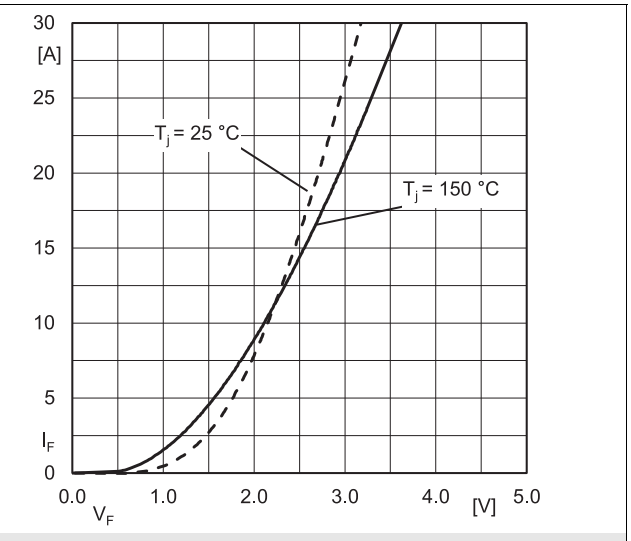

Fig. 10: Typ. Inv. diode forward charact., incl. $R_{CC'+EE'}$

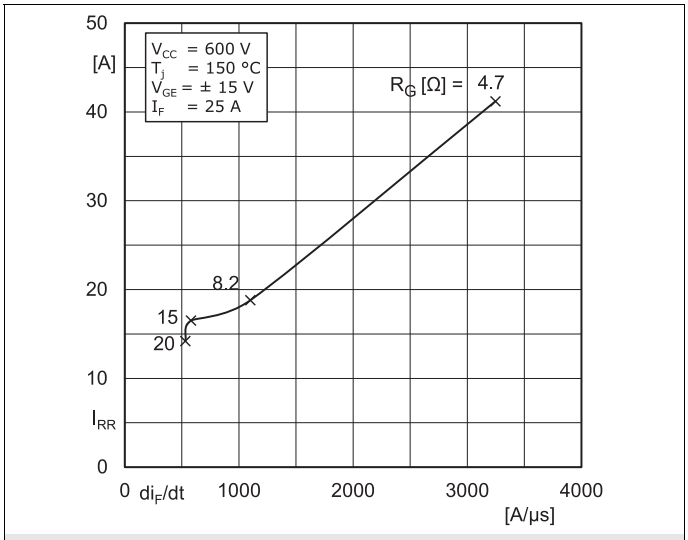

Fig. 11: Typ. Inv. diode peak reverse recovery current

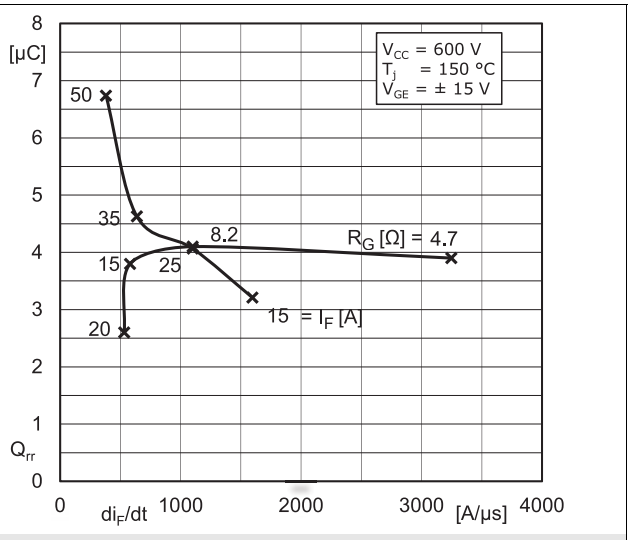

Fig. 12: Typ. Inv. diode reverse recovery charge

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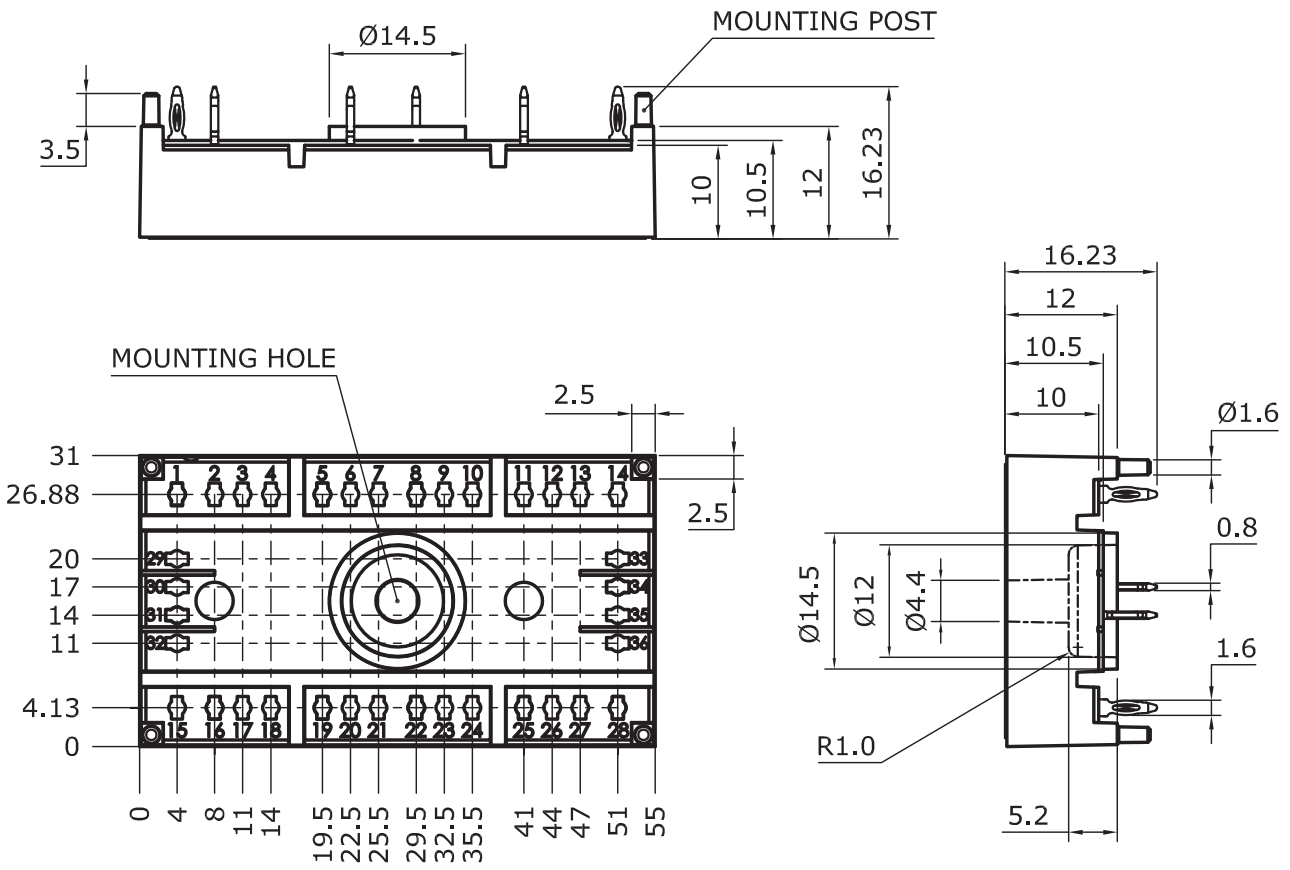
Dimensions: mm
Tolerance system: ISO 2768-m



Suggested drilled hole diameter for terminal pins in the circuit board:
- refer Mounting Instruction SEMITOP® Classic

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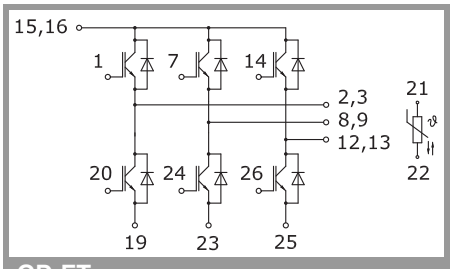
SEMITOP 3 Press-Fit



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This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

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