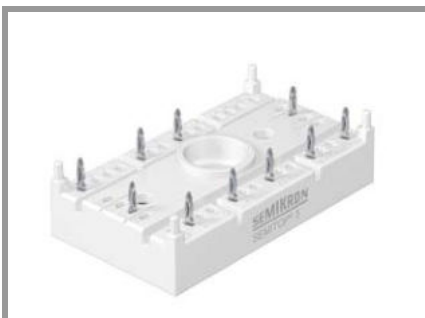


SK 25 GD 12T4 ETp



SEMITOP® 3 Press-Fit

Sixpack Open Emitter

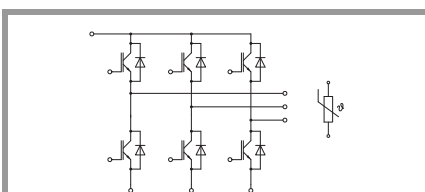
SK 25 GD 12T4 ETp

Features*

- One screw mounting module
- Optimized design for superior thermal performances
- Low inductive design
- Compatible with other SEMITOP® Press-Fit types
- 1200V Trench IGBT (T4)
- Robust and soft switching CAL4F diode technology
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications

- Motor Drives
- Servo Drives
- Air Conditioning
- Auxiliary Inverters
- UPS



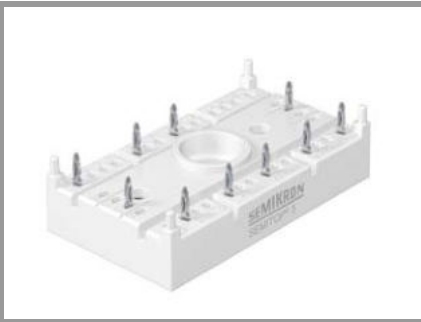
GD-ET

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
IGBT 1				
V_{CES}	$T_j = 25\text{ °C}$	1200	V	
I_C	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	32	A
		$T_s = 70\text{ °C}$	24	A
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	35	A
		$T_s = 70\text{ °C}$	29	A
I_{Chom}		25	A	
I_{CRM}		75	A	
V_{GES}		-20 ... 20	V	
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 150\text{ °C}$	10	μs
T_j		-40 ... 175	$^{\circ}\text{C}$	

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
Diode 1				
V_{RRM}	$T_j = 25\text{ °C}$	1200	V	
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	25	A
		$T_s = 70\text{ °C}$	19	A
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	28	A
		$T_s = 70\text{ °C}$	22	A
I_{FRM}		50	A	
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	100	A	
T_j		-40 ... 175	$^{\circ}\text{C}$	

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{t(RMS)}$	$\Delta T_{\text{terminal}}$ at PCB joint = 30 K, per pin	35	A
T_{stg}	module without TIM	-40 ... 125	$^{\circ}\text{C}$
V_{isol}	AC, sinusoidal, $t = 1\text{ min}$	2500	V

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SEMITOP® 3 Press-Fit

Sixpack Open Emitter

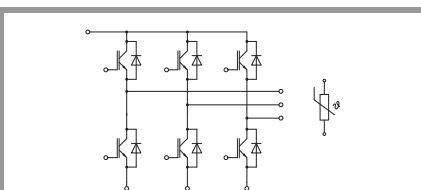
SK 25 GD 12T4 ETp

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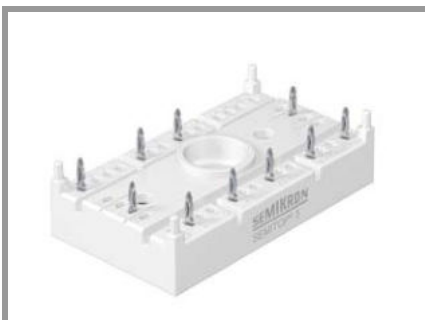


GD-ET

Characteristics			min.	typ.	max.	Unit
Symbol	Conditions					
IGBT 1						
$V_{CE(sat)}$	$I_C = 25\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$		1.85	2.10	V
		$T_j = 150\text{ °C}$		2.25	2.45	V
V_{CE0}	chipelevel	$T_j = 25\text{ °C}$		0.80	0.90	V
		$T_j = 150\text{ °C}$		0.70	0.80	V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$		42	48	mΩ
		$T_j = 150\text{ °C}$		62	66	mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0.85\text{ mA}$		5.3	5.8	6.3	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25\text{ °C}$			1	mA
					-	mA
C_{ies}	$V_{CE} = 25\text{ V}$	$f = 1\text{ MHz}$		1.45		nF
C_{oes}	$V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		0.12		nF
C_{res}		$f = 1\text{ MHz}$		0.05		nF
Q_G	$V_{GE} = -7V...+15V$			142		nC
R_{Gint}	$T_j = 25\text{ °C}$			0		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		22		ns
t_r	$I_C = 25\text{ A}$ $V_{GE\ neg} = -7\text{ V}$	$T_j = 150\text{ °C}$		19.5		ns
		$T_j = 150\text{ °C}$		2.27		mJ
E_{on}	$V_{GE\ pos} = 15\text{ V}$	$T_j = 150\text{ °C}$		2.27		mJ
$t_{d(off)}$	$R_{G\ on} = 19\text{ Ω}$	$T_j = 150\text{ °C}$		288		ns
t_f	$R_{G\ off} = 19\text{ Ω}$	$T_j = 150\text{ °C}$		77.5		ns
E_{off}	$di/dt_{on} = 2825\text{ A/μs}$ $di/dt_{off} = 1685\text{ A/μs}$	$T_j = 150\text{ °C}$		2.7		mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste}=0.8\text{ W/(mK)}$			1.31		K/W

Characteristics			min.	typ.	max.	Unit
Symbol	Conditions					
Diode 1						
V_F	$I_F = 25\text{ A}$ chipelevel	$T_j = 25\text{ °C}$		2.41	2.74	V
		$T_j = 150\text{ °C}$		2.45	2.79	V
V_{F0}	chipelevel	$T_j = 25\text{ °C}$		1.30	1.50	V
		$T_j = 150\text{ °C}$		0.90	1.10	V
r_F	chipelevel	$T_j = 25\text{ °C}$		44	50	mΩ
		$T_j = 150\text{ °C}$		62	68	mΩ
I_{RRM}	$I_F = 25\text{ A}$	$T_j = 150\text{ °C}$		31.5		A
Q_{rr}	$di/dt_{off} = 2825\text{ A/μs}$	$T_j = 150\text{ °C}$		1.15		μC
E_{rr}	$V_{GE} = -7\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		1.28		mJ
$R_{th(j-s)}$	per diode, $\lambda_{paste}=0.8\text{ W/(mK)}$			1.91		K/W

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SEMITOP® 3 Press-Fit

Sixpack Open Emitter

SK 25 GD 12T4 ETp

Features*

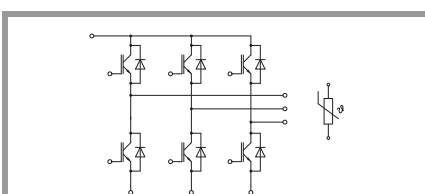
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Typical Applications

- Motor Drives
- Servo Drives
- Air Conditioning
- Auxiliary Inverters
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Module					
M _s	to heatsink	2.25		2.5	Nm
w	weight		30		g

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R ₁₀₀	T _r = 100 °C		493 ± 5%		Ω
B _{100/125}	R _(T) = R ₁₀₀ exp[B _{100/125} (1/T - 1/T ₁₀₀)]; T[K];		3550 ±2%		K



GD-ET

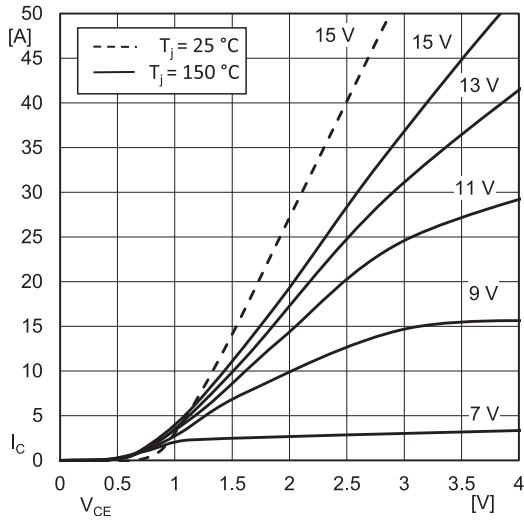


Fig. 1: Typ. IGBT1 output characteristic, incl. $R_{CC'+EE'}$

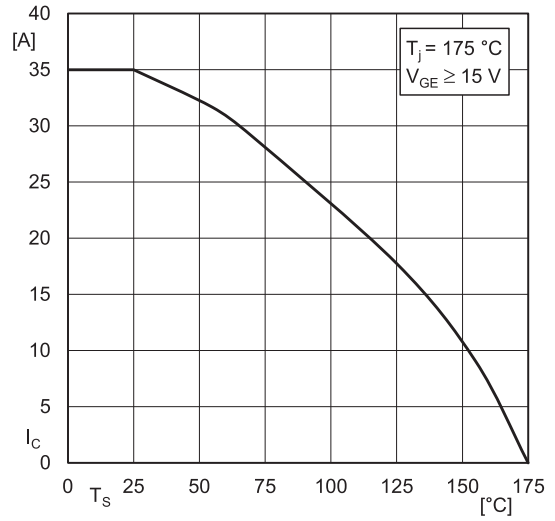


Fig. 2: Typ. rated current vs. temperature $I_C = f(T_s)$

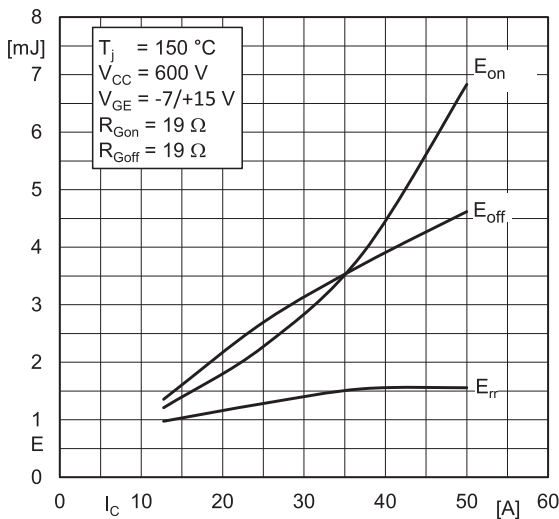


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

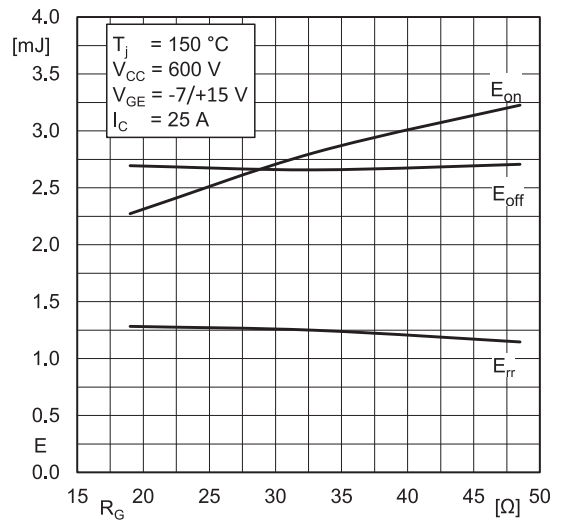


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

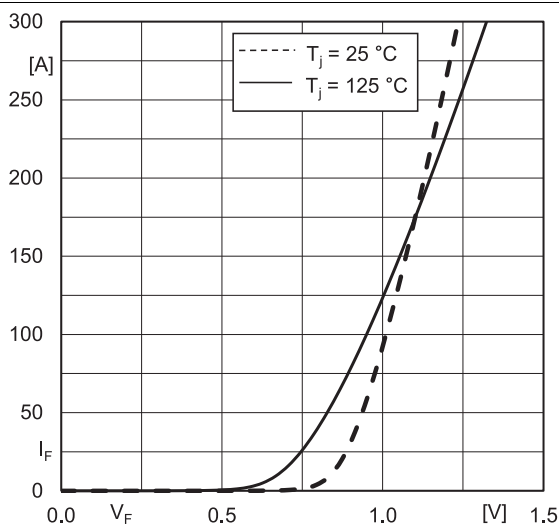


Fig. 5: Typ. IGBT1 transfer characteristic

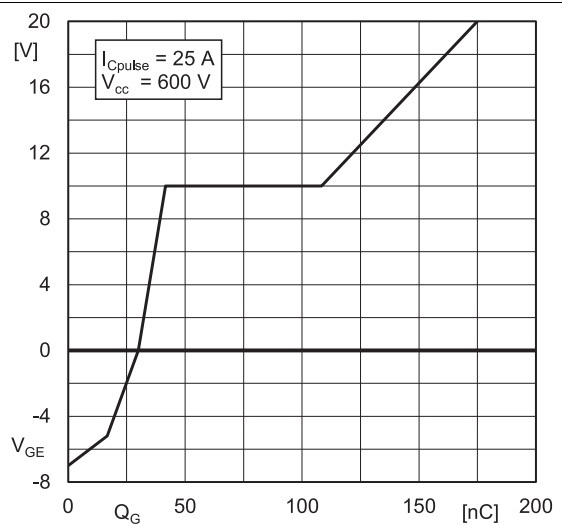


Fig. 6: Typ. gate charge characteristic

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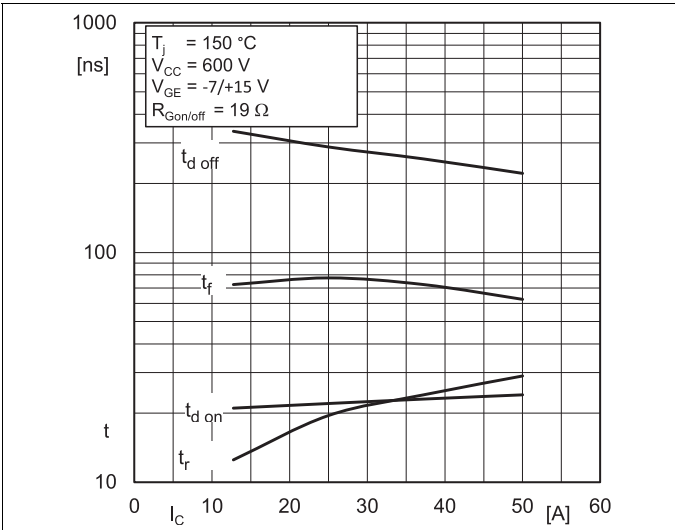


Fig. 7: Typ. switching times vs. I_C

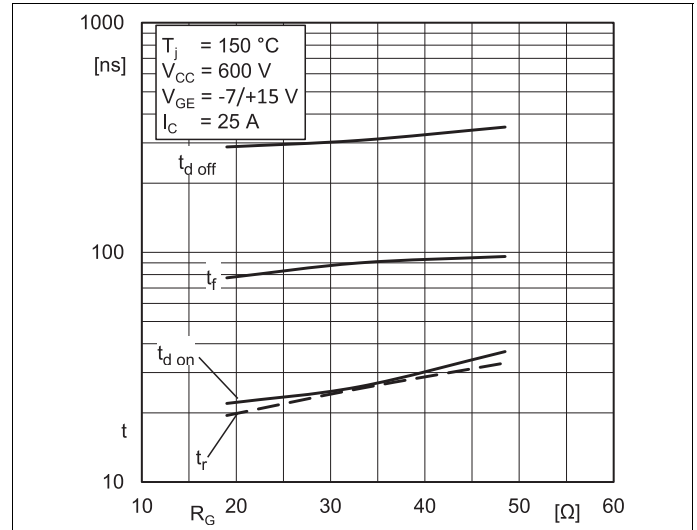


Fig. 8: Typ. switching times vs. gate resistor R_G

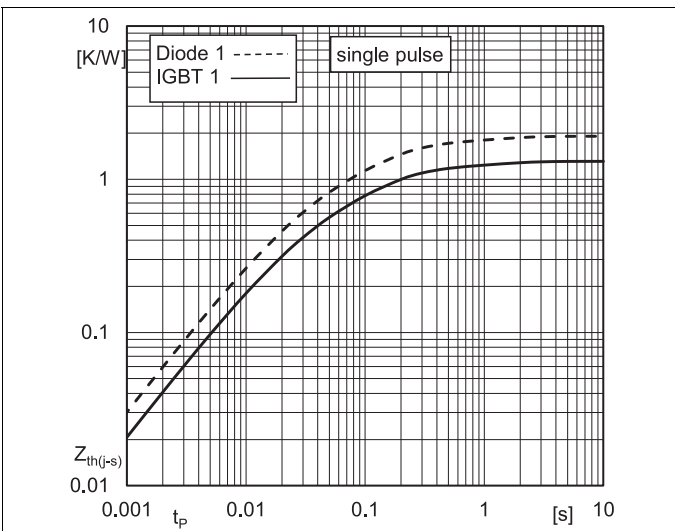


Fig. 9: Typ. transient thermal impedance

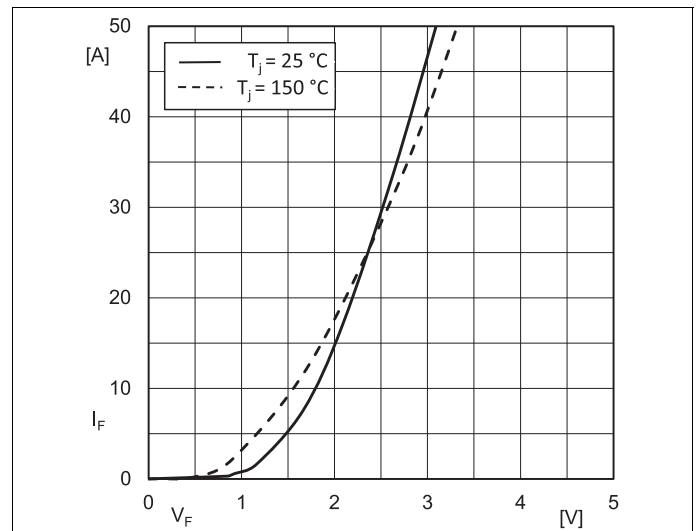
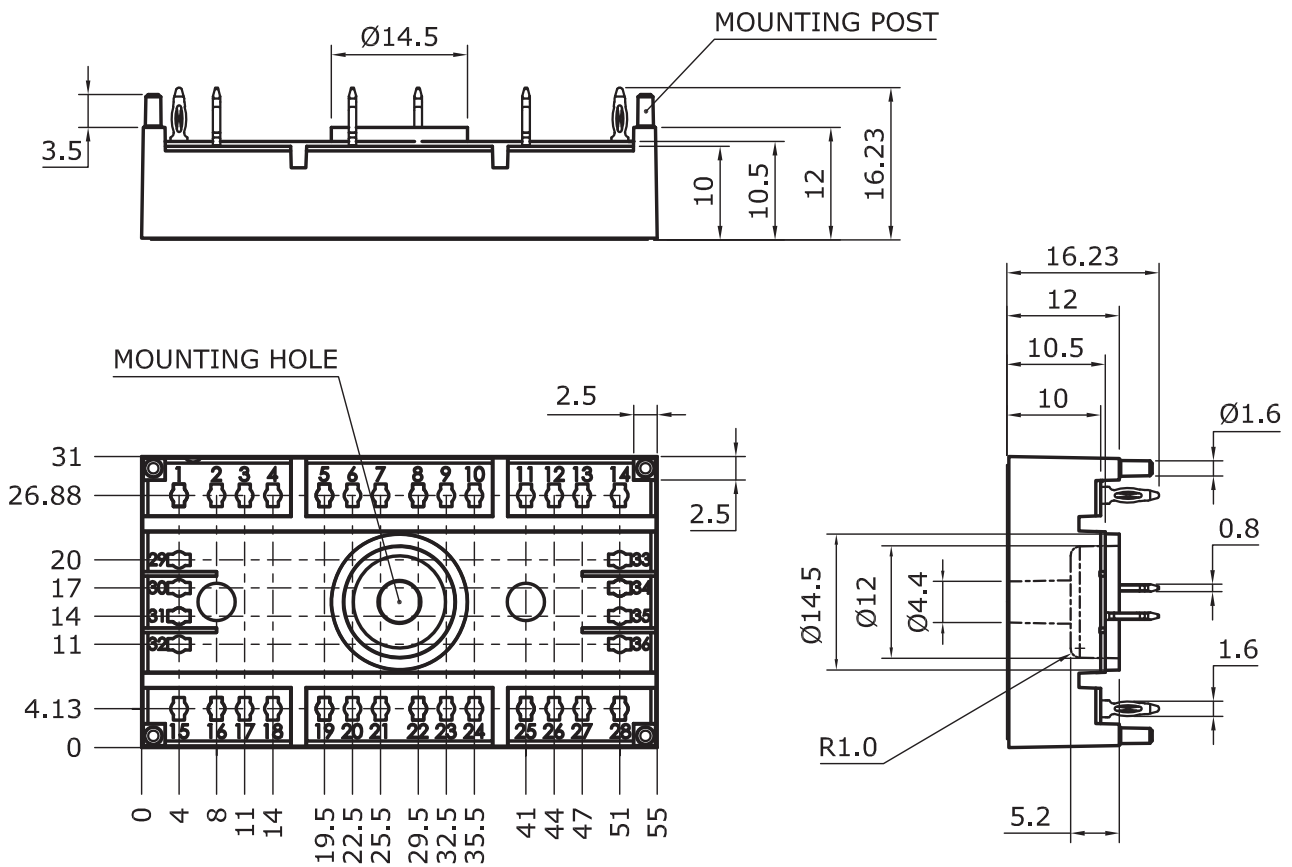


Fig. 10: Typ. CAL diode forward charact., incl. $R_{CC'+EE'}$

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Dimensions: mm

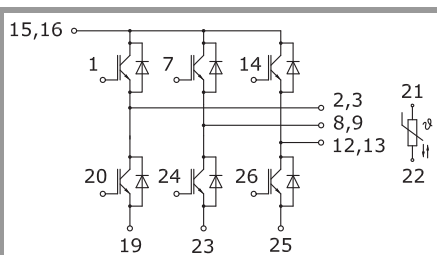
Tolerance system: ISO 2768-m



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

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SEMITOP 3 Press-Fit



GD-ET

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

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