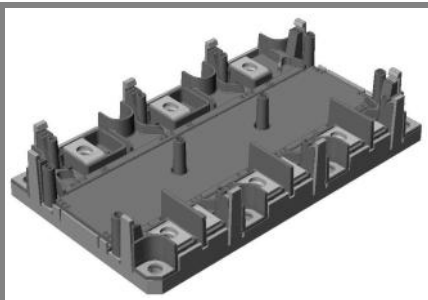


SKiM455GD12T4D1



SKiM[®] 5

Trench IGBT modules

SKiM455GD12T4D1

Preliminary Data

Features

- IGBT 4 = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications*

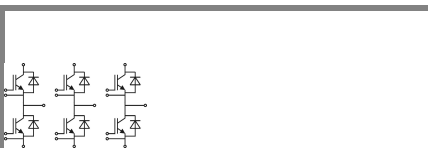
- High Reliability AC inverter drives
- UPS

Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max
- $T_{j,max}$ of the diode is limited to 150°C

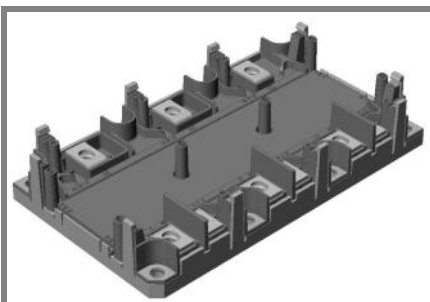
| Absolute Maximum Ratings | | $T_c = 25^\circ\text{C}$, unless otherwise specified | | | |
|--------------------------|--|---|-----|------------------|---|
| Symbol | Conditions | Values | | Units | |
| IGBT | | | | | |
| V_{CES} | $T_j = ^\circ\text{C}$ | 1200 | | V | |
| I_C | $T_j = 150^\circ\text{C}$ | $T_{heatsink} = 25^\circ\text{C}$ | 400 | | A |
| | | $T_{heatsink} = 70^\circ\text{C}$ | 305 | | A |
| I_{CRM} | $I_{CRM} = 3 \times I_{CNOM}$ | 1350 | | A | |
| V_{GES} | | ± 20 | | V | |
| t_{psc} | $V_{CC} = 800\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 1200\text{ V}$ | 10 | | μs | |
| Inverse Diode | | | | | |
| I_F | $T_j = 150^\circ\text{C}$ | $T_{heatsink} = 25^\circ\text{C}$ | 295 | | A |
| | | $T_{heatsink} = 70^\circ\text{C}$ | 215 | | A |
| I_{FRM} | $I_{FRM} = 2 \times I_{FNOM}$ | 600 | | A | |
| Module | | | | | |
| $I_{t(RMS)}$ | | | | A | |
| T_{vj} | | -40 ... +150 | | $^\circ\text{C}$ | |
| T_{stg} | | -40 ... +125 | | $^\circ\text{C}$ | |
| V_{isol} | AC, 1 min. | 2500 | | V | |

| Characteristics | | $T_c = 25^\circ\text{C}$, unless otherwise specified | | | |
|-----------------|---|--|------|----------|------------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 18\text{ mA}$ | 5 | 5,8 | 6,5 | V |
| I_{CES} | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ | | | 0,3 | mA |
| V_{CE0} | | $T_j = 25^\circ\text{C}$ | 0,8 | | V |
| | | $T_j = 125^\circ\text{C}$ | 0,7 | | V |
| r_{CE} | $V_{GE} = 15\text{ V}$ | $T_j = 25^\circ\text{C}$ | 2,2 | | $\text{m}\Omega$ |
| | | $T_j = 125^\circ\text{C}$ | 3,1 | | $\text{m}\Omega$ |
| $V_{CE(sat)}$ | $I_{Cnom} = 450\text{ A}, V_{GE} = 15\text{ V}$ | $T_j = 25^\circ\text{C}_{chiplev.}$ | 1,8 | | V |
| | | $T_j = 125^\circ\text{C}_{chiplev.}$ | 2,1 | | V |
| C_{ies} | $V_{CE} = 25, V_{GE} = 0\text{ V}$ | $f = 1\text{ MHz}$ | 27,9 | | nF |
| C_{oes} | | | 1,7 | | nF |
| C_{res} | | | 1,5 | | nF |
| Q_G | $V_{GE} = -8\text{V}/+15\text{V}$ | 2600 | | nC | |
| R_{Gint} | $T_j = 25^\circ\text{C}$ | 1,7 | | Ω | |
| $t_{d(on)}$ | $R_{Gon} = 1\ \Omega$ $di/dt = 8200\text{ A}/\mu\text{s}$ | $V_{CC} = 600\text{V}$ $I_C = 450\text{A}$ | 265 | | ns |
| t_r | | | 60 | | ns |
| E_{on} | | | 34 | | mJ |
| $t_{d(off)}$ | $R_{Goff} = 1\ \Omega$ $di/dt = 5300\text{ A}/\mu\text{s}$ | $T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{V}$ | 470 | | ns |
| t_f | | | 65 | | ns |
| E_{off} | | | 40 | | mJ |
| $R_{th(j-s)}$ | per IGBT | 0,14 | | K/W | |



GD

SKiM455GD12T4D1



SKiM[®] 5

Trench IGBT modules

SKiM455GD12T4D1

Preliminary Data

Features

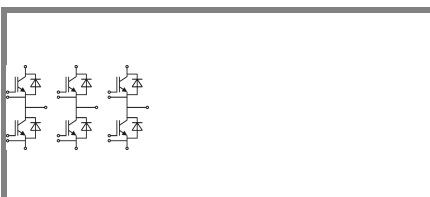
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Typical Applications*

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- UPS

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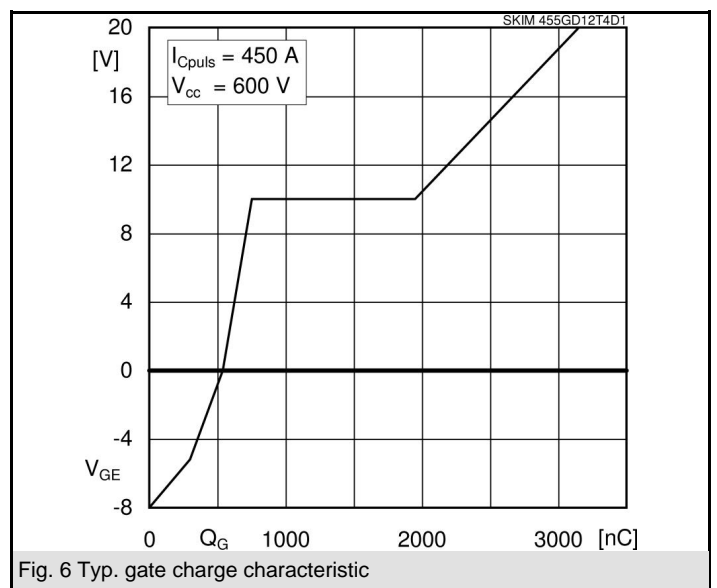
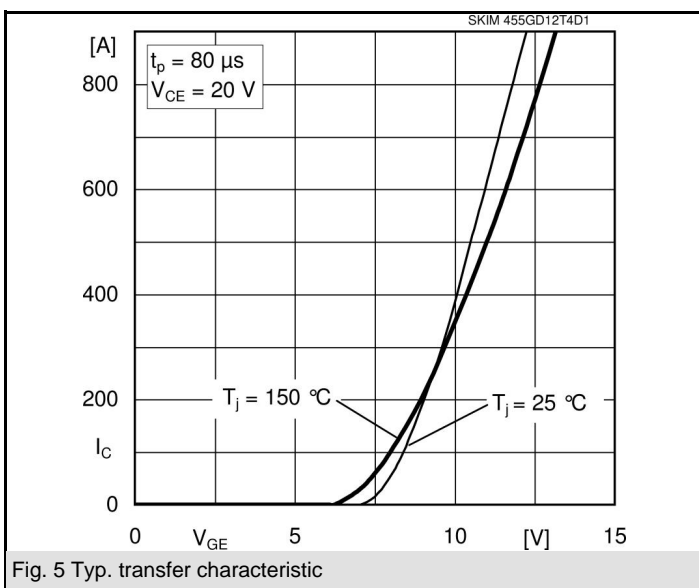
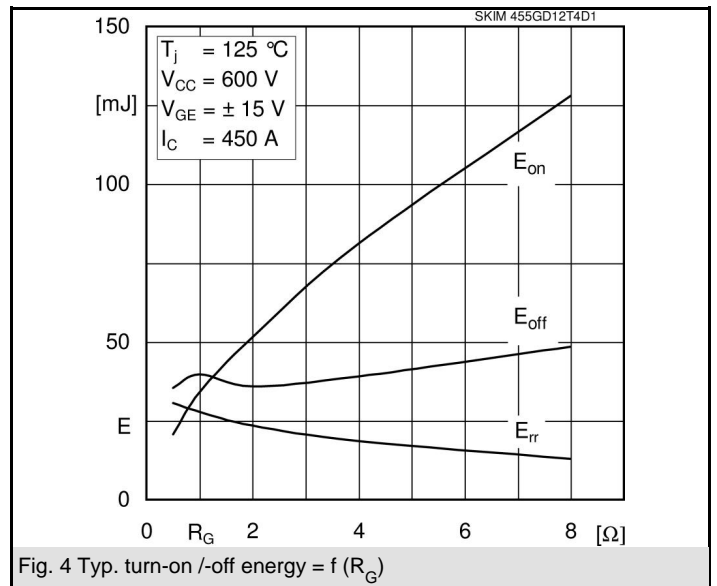
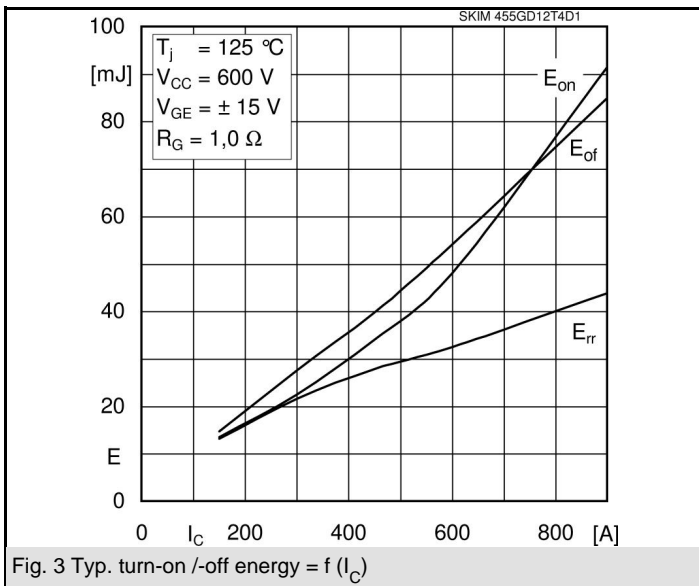
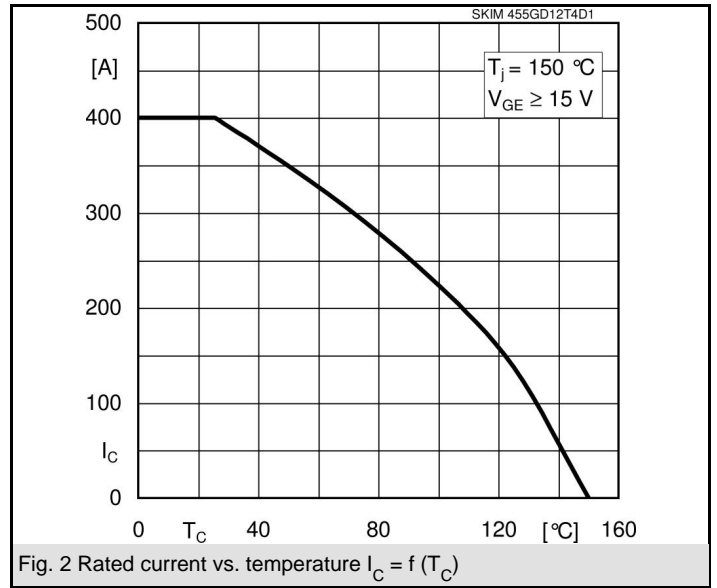
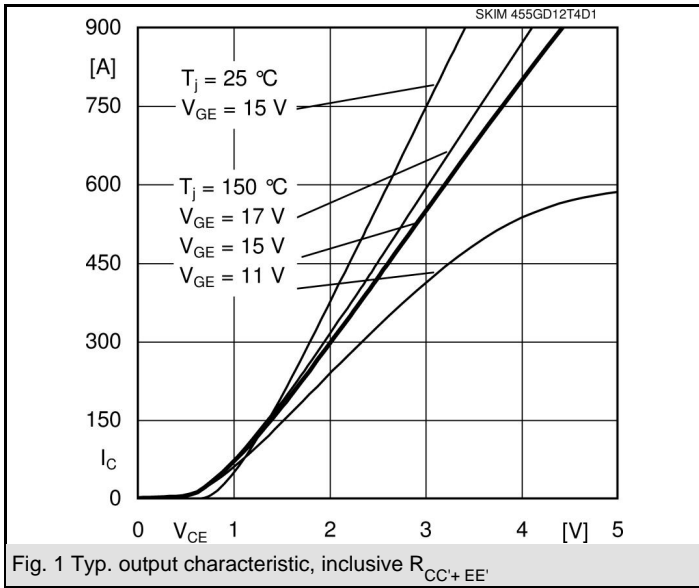


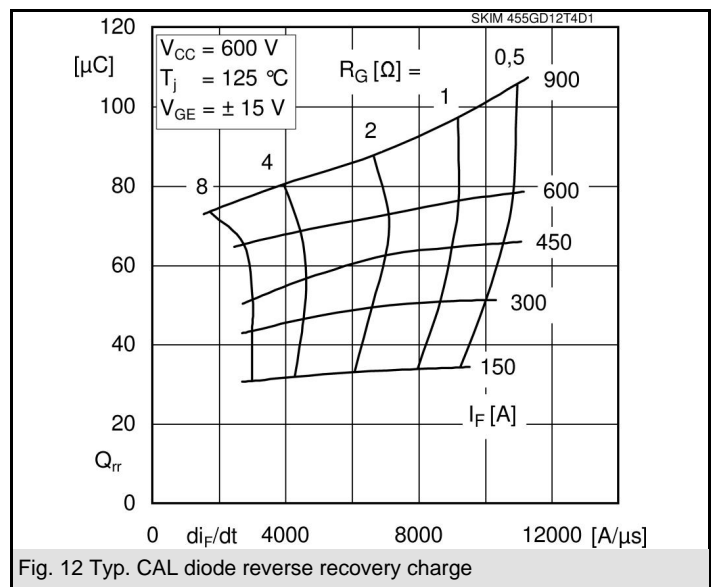
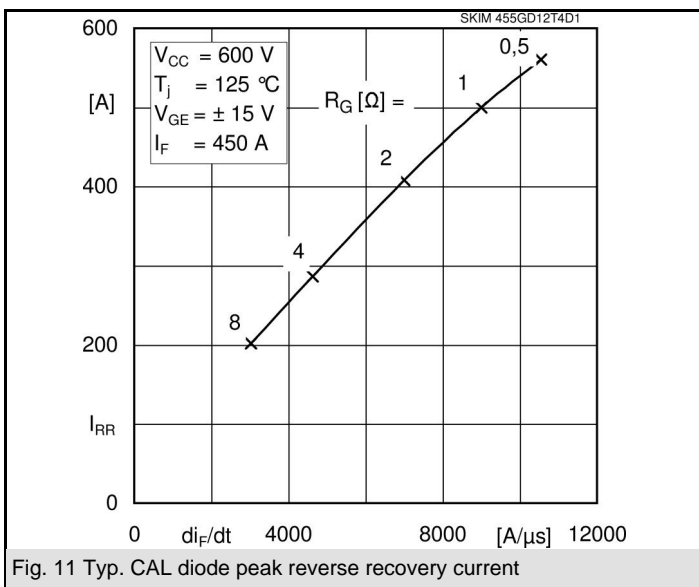
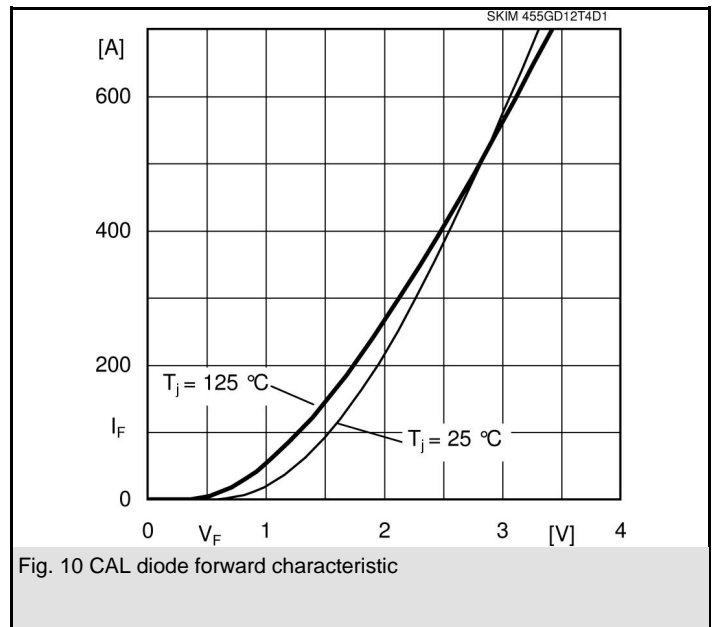
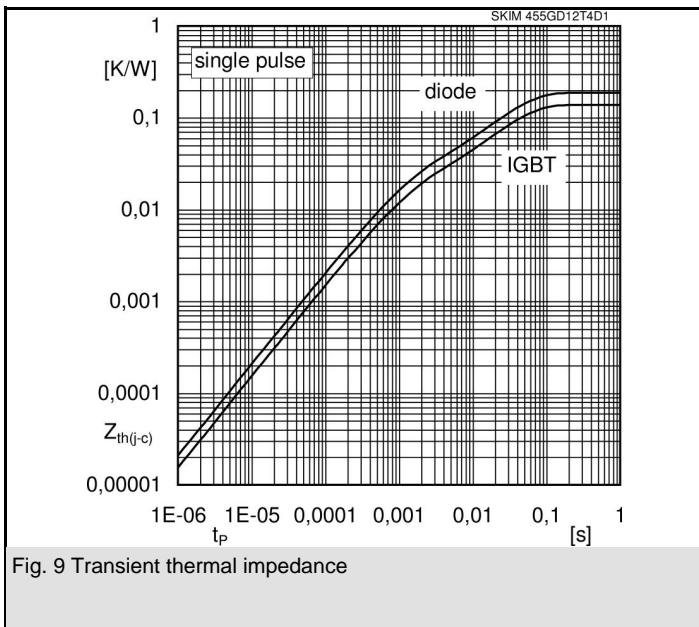
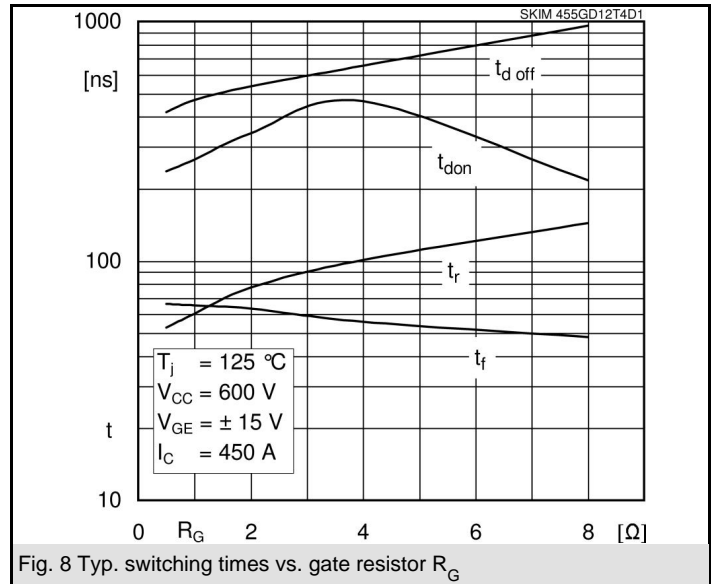
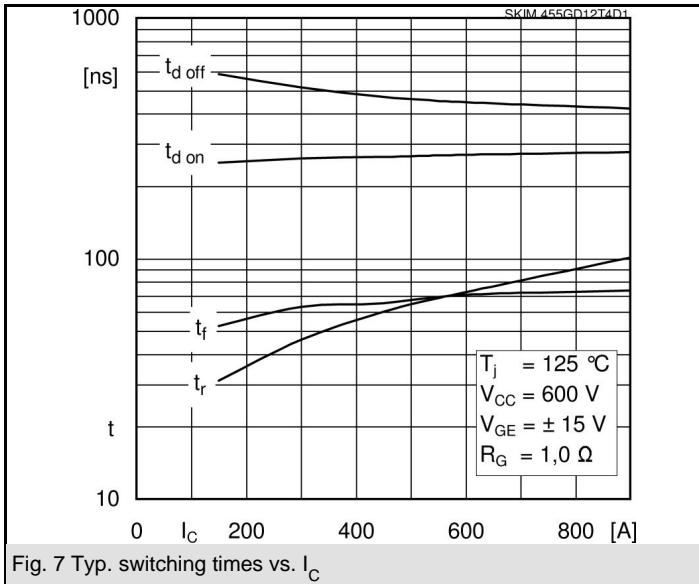
GD

| Characteristics | | | min. | typ. | max. | Units |
|---------------------------|--|--------------------------------------|------|----------|------|-------|
| Symbol | Conditions | | | | | |
| Inverse Diode | | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 450 \text{ A}; V_{GE} = 0 \text{ V}$ | $T_j = 25^\circ\text{C}_{chiplev.}$ | | 2,3 | 2,8 | V |
| | | $T_j = 125^\circ\text{C}_{chiplev.}$ | | 2,2 | 2,7 | V |
| V_{F0} | | $T_j = 25^\circ\text{C}$ | | 1,2 | 1,6 | V |
| | | $T_j = 125^\circ\text{C}$ | | 0,9 | 1,3 | V |
| r_F | | $T_j = 25^\circ\text{C}$ | | 2,3 | 2,7 | mΩ |
| | | $T_j = 125^\circ\text{C}$ | | 2,8 | 3,1 | mΩ |
| I_{RRM} | $I_F = 450 \text{ A}$ | $T_j = 125^\circ\text{C}$ | | 500 | | A |
| Q_{rr} | $di/dt = 9000 \text{ A}/\mu\text{s}$ | | | 64,5 | | μC |
| E_{rr} | $V_{GE} = -15\text{V}$ | | | 27,8 | | mJ |
| $R_{th(j-s)}$ | per diode | | | 0,19 | | K/W |
| Module | | | | | | |
| L_{CE} | | | | | 20 | nH |
| $R_{CC'+EE'}$ | res., terminal-chip | $T_{case} = 25^\circ\text{C}$ | | 0,9 | | mΩ |
| | | $T_{case} = 125^\circ\text{C}$ | | 1,1 | | mΩ |
| M_s | to heat sink M5 | | | | | Nm |
| M_t | to terminals M6 | | 4 | | 5 | Nm |
| w | | | | | 460 | g |
| Temperature sensor | | | | | | |
| R_{TS} | $T = 25 (100)^\circ\text{C}$ | | | 1 (1,67) | | kΩ |
| Tolerance | $T = 25 (100)^\circ\text{C}$ | | | 3 (2) | | % |

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

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.





SKiM455GD12T4D1

UL recognized file

no. E 63 532

