

Features :

- Low $V_{CE(sat)}$ Trench IGBT technology
- $V_{CE(sat)}$ with positive temperature coefficient
- Low inductance case
- Fast & soft reverse recovery anti-parallel FWD
- Isolated copper baseplate using DBC technology

Typical Applications :

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
V_{CES}	Collector-Emitter voltage	$T_j=25^\circ\text{C}$			1700	V
V_{GES}	Gate-Emitter voltage	$T_j=25^\circ\text{C}$			± 20	V
I_C	Collector current	Continuous@ $T_C=115^\circ\text{C}$			600	A
I_{CM}		$T_P=1\text{ms}$			1200	A
P_D	Collector power dissipation	$T_j=175^\circ\text{C}$, 1 device			3570	W
T_j	Junction temperature	/			175	$^\circ\text{C}$
T_{stg}	Storage temperature	/	-40		125	$^\circ\text{C}$
V_{iso}	Isolation between terminal and copper base	$T_j=25^\circ\text{C}$, AC: 1minute	4000			V
I_{CES}	Zero gate voltage collector current	$T_j=25^\circ\text{C}$, $V_{CE}=1700\text{V}$, $V_{GE}=0\text{V}$			1.0	mA
I_{GES}	Gate-Emitter leakage current	$T_j=25^\circ\text{C}$, $V_{CE}=0\text{V}$, $V_{GE}=\pm 20\text{V}$	-500		500	nA
$V_{GE(th)}$	Gate-Emitter threshold voltage	$T_j=25^\circ\text{C}$, $V_{CE}=20\text{V}$, $I_C=30\text{mA}$	5.0	6.15	7.5	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	$T_j=25^\circ\text{C}$, $V_{GE}=15\text{V}$, $I_C=600\text{A}$		1.65	2.00	V
		$T_j=125^\circ\text{C}$, $V_{GE}=15\text{V}$, $I_C=600\text{A}$		1.85		V
		$T_j=175^\circ\text{C}$, $V_{GE}=15\text{V}$, $I_C=600\text{A}$		2.05		V
Q_G	Gate charge	$V_{GE}=\pm 15\text{V}$		4.50		μC
R_{Gint}	Internal Gate Resistance			1.4		Ω
C_{ies}	Input capacitance	$T_j=25^\circ\text{C}$, $V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		45.9		nF
C_{res}	Reverse transfer capacitance			1.40		nF
$t_{d(on)}$	Turn-on Delay time	$T_j=175^\circ\text{C}$, $V_{CC}=900\text{V}$, $I_C=600\text{A}$, $V_{GE}=\pm 15\text{V}$, $R_G=1.5\Omega$		150		ns
t_r	Rise Time			62		ns
$t_{d(off)}$	Turn-off Delay time			775		ns
t_f	Fall Time			660		ns
E_{on}	Turn-on Switching Loss			261		mJ
E_{off}	Turn-off Switching Loss			216		mJ
I_{sc}	SC Date	$T_P \leq 10\mu\text{s}$, $V_{GE}=15\text{V}$, $T_j=175^\circ\text{C}$, $V_{CC}=1200\text{V}$, $V_{CEM} \leq 1700\text{V}$		2300		A
t_{sc}	Short circuit withstand time	$T_j=150^\circ\text{C}$, $V_{CC}=720\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_g=7.5\Omega$	10			μs

V _F	Forward on voltage	T _j =25°C ,I _F =600A,V _{GE} =0V		1.70	2.15	V
		T _j =125°C ,I _F =600A,V _{GE} =0V		1.90		V
		T _j =175°C ,I _F =600A,V _{GE} =0V		1.95		V
I _{RM}	Peak Reverse Recovery Current	V _R =900V, I _F =600A, -di/dt=10200A/μs, V _{GE} =-15V, T _j =175°C		612		A
Q _r	Recovered Charge			272		μC
E _{rec}	Reverse Recovery Energy			153		mJ
t _{rr}	Reverse recovery time	T _j =150°C ,I _F =600A		1420		ns
R _{th(j-c)}	Thermal resistance	per IGBT			0.042	°C/W
		per Diode			0.073	°C/W
R _{th(c-f)}	Contact thermal resistance (per module)	With thermal compound		0.009		°C/W
R ₂₅	Rated Resistance	T _j =25°C		5.0		k Ω
ΔR/R	Deviation of R ₁₀₀	T _C =100°C,R ₁₀₀ =493.3 Ω	-5		5	%
P ₂₅	Power Dissipation	Continuous@ T _C =100°C			20.0	mW
B _{25/50}	B-value	R ₂ =R ₂₅ exp[B _{25/50} (1/T ₂ -1/(298.15K))]		3375		K
B _{25/80}	B-value	R ₂ =R ₂₅ exp[B _{25/80} (1/T ₂ -1/(298.15K))]		3411		K
B _{25/100}	B-value	R ₂ =R ₂₅ exp[B _{25/100} (1/T ₂ -1/(298.15K))]		3433		K
Screw torque	Mounting(M5)	/	2.4		3.0	N·m
	Terminals(M6)	/	3.5		5.0	N·m
W _t	Weight				350	g
Outline	M43					

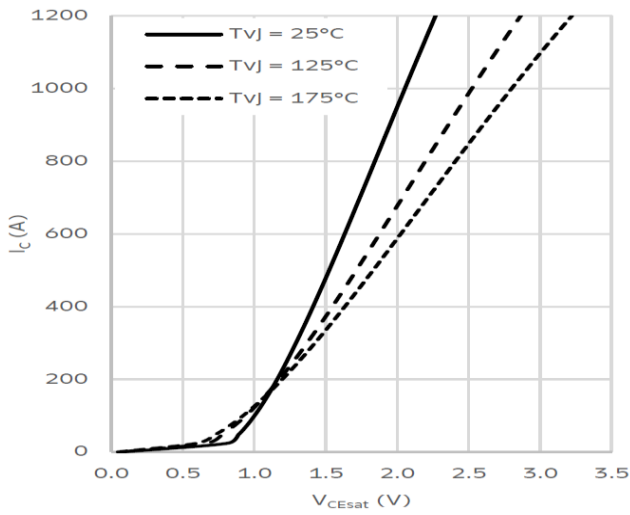


Fig 1. IGBT on-state characteristics

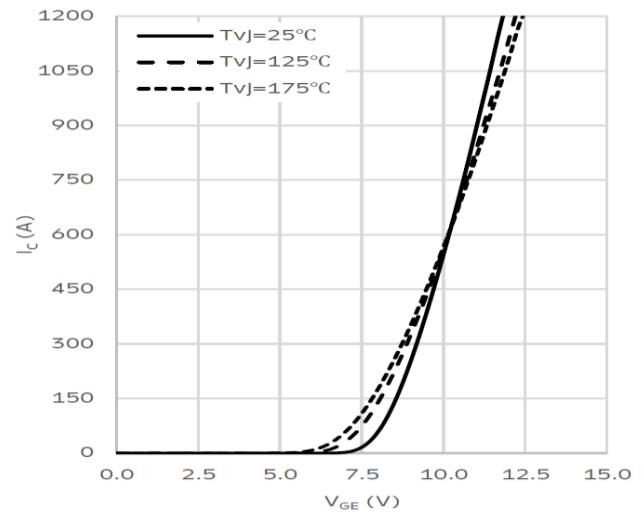


Fig 2. IGBT Transfer Characteristics

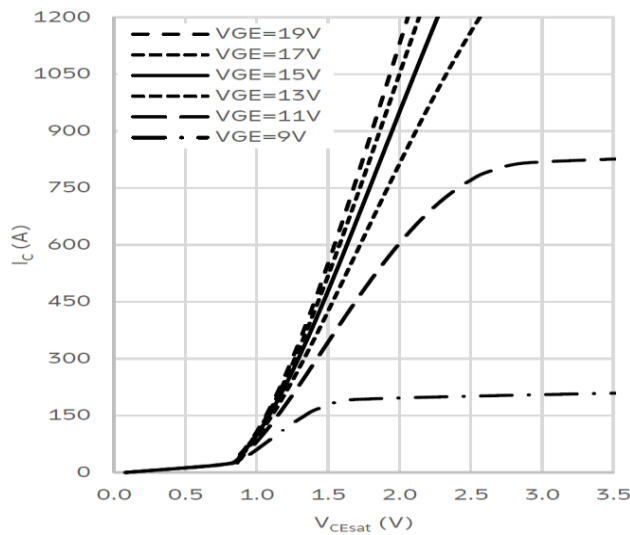


Fig 3. IGBT output characteristics

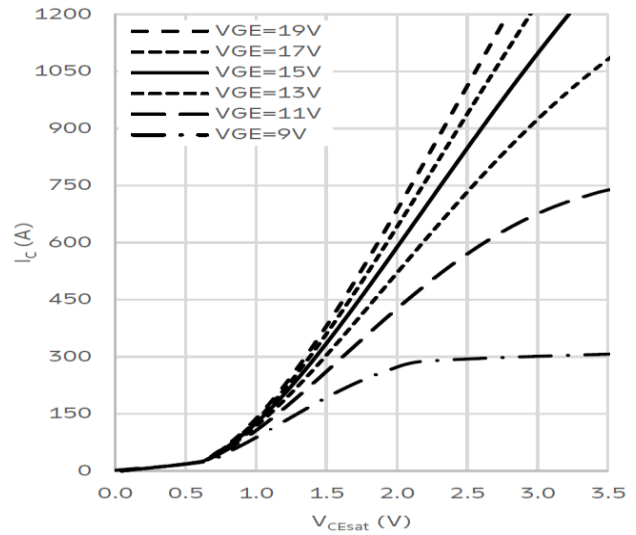


Fig 4. IGBT output characteristics

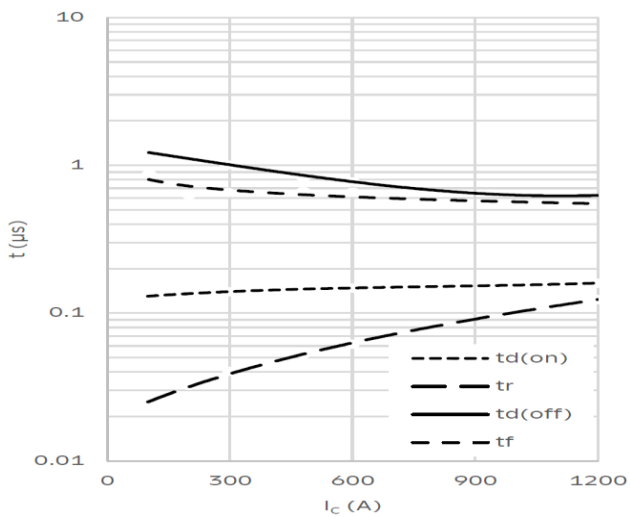


Fig 5. IGBT switching losses

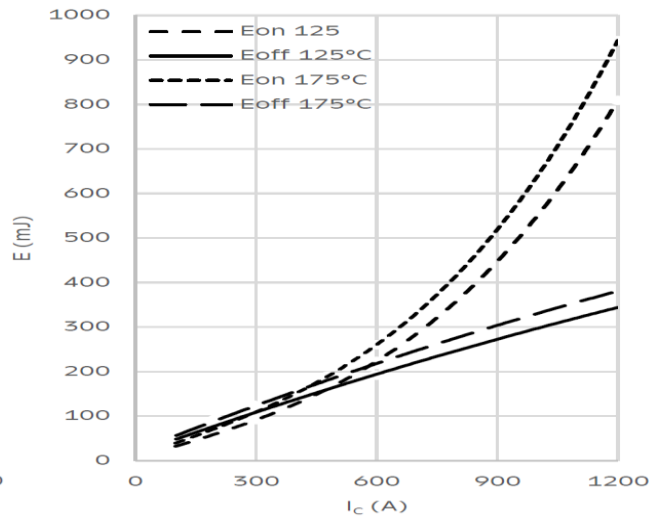


Fig 6. IGBT switching times

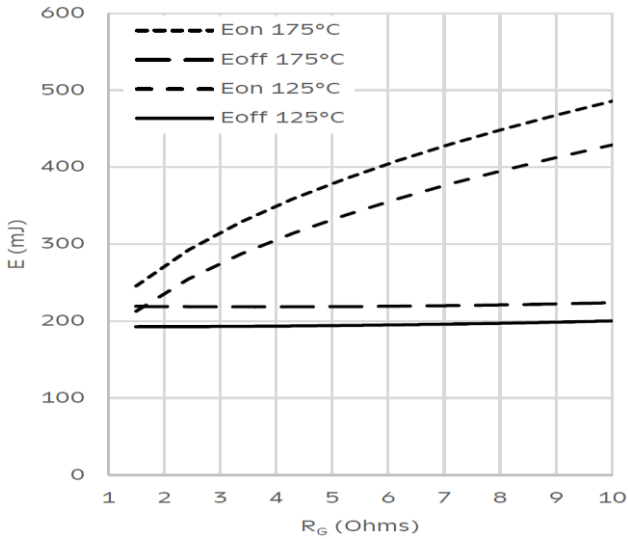


Fig 7. IGBT switching losses

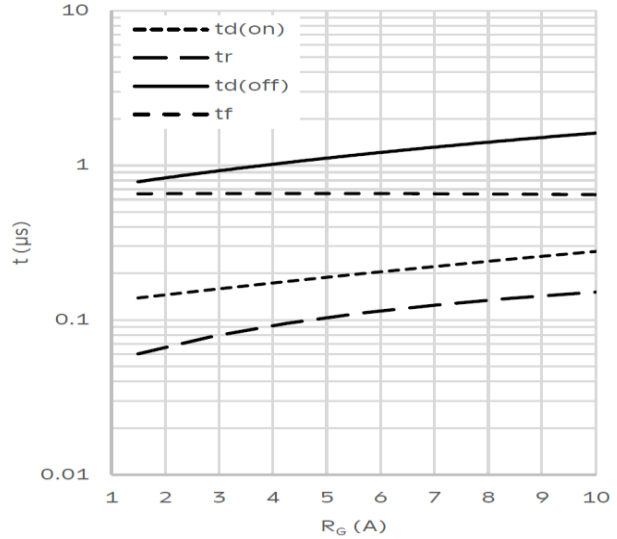


Fig 8. IGBT switching times

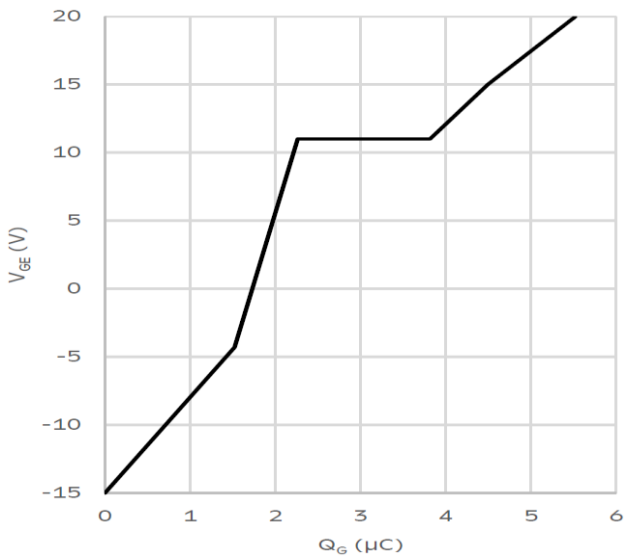


Fig 9. IGBT gate charge

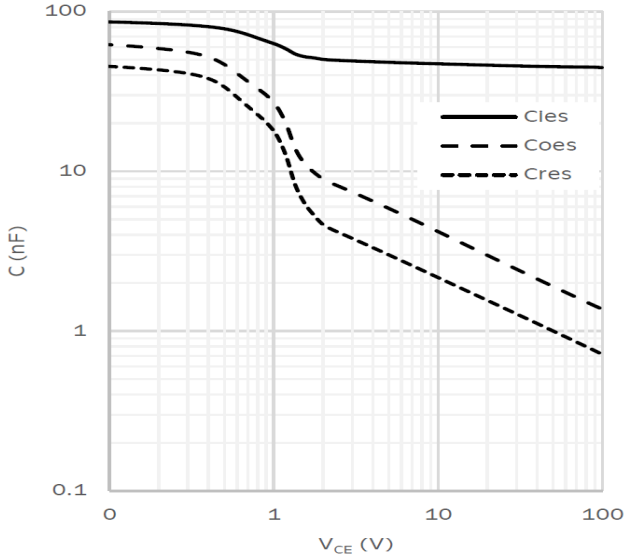


Fig 10. Capacitance characteristics

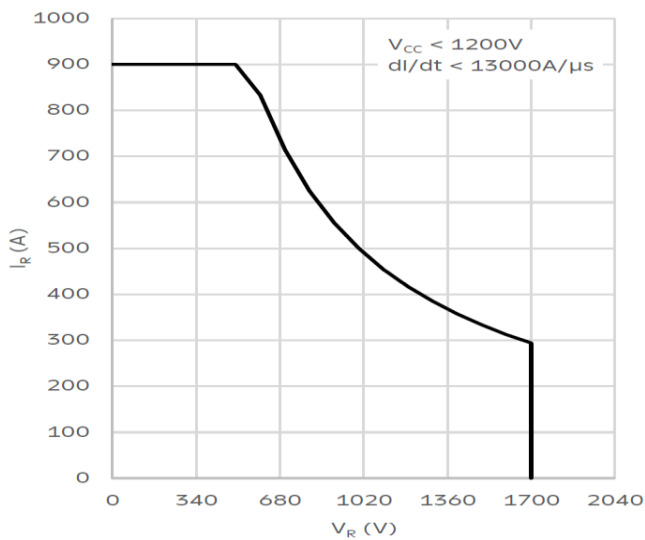


Fig 11. IGBT RBSOA

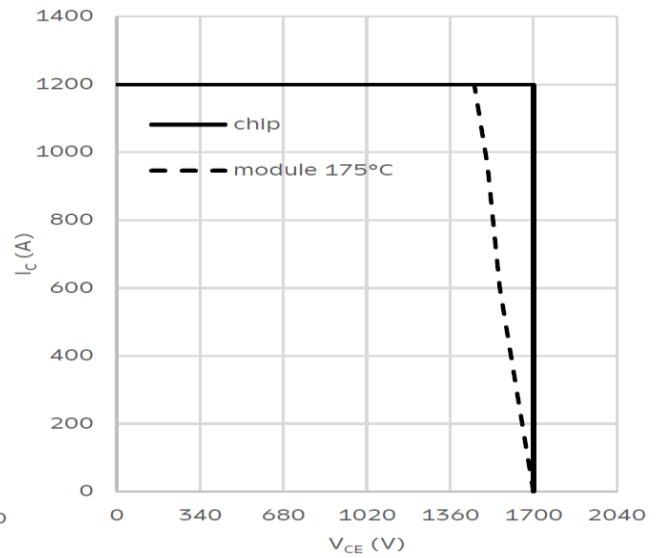


Fig 12. Diode SOA

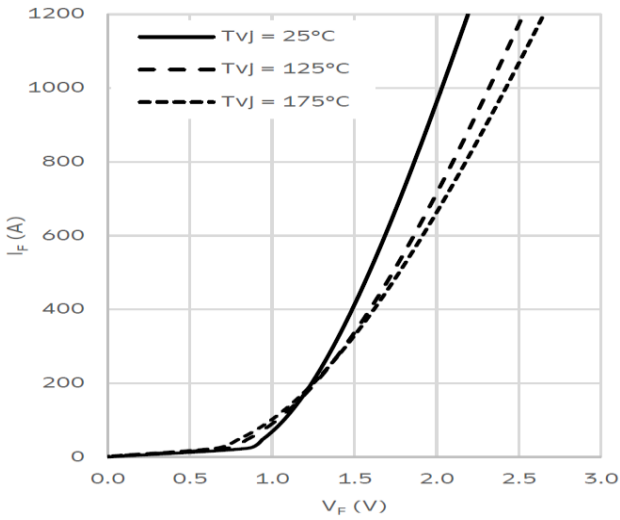


Fig 13. Diode forward characteristic

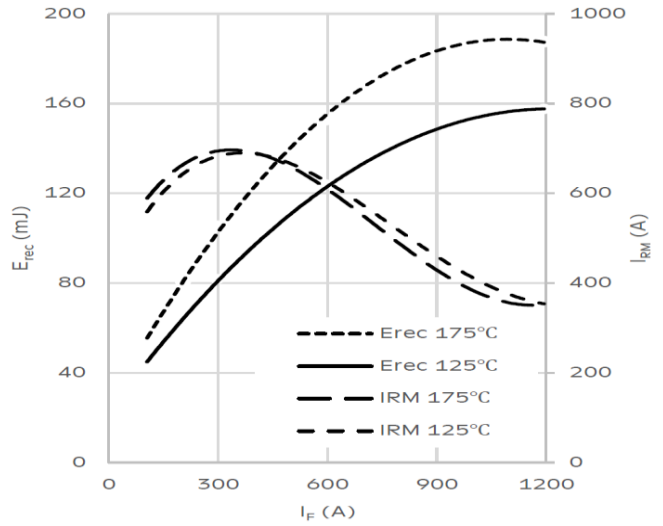


Fig 14. Diode switching characteristics

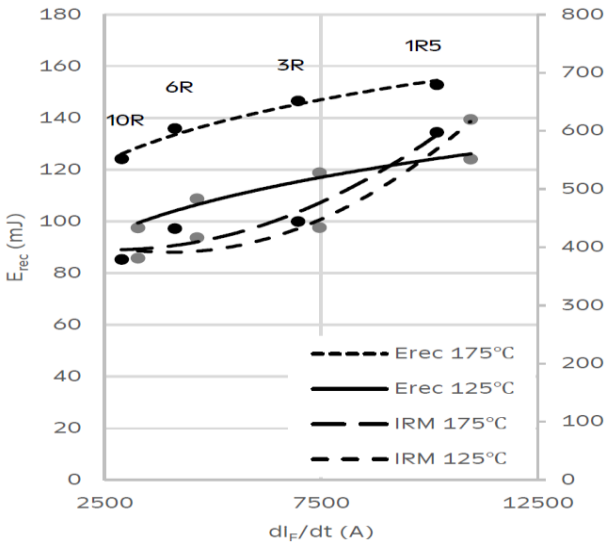


Fig 15. Diode switching characteristics

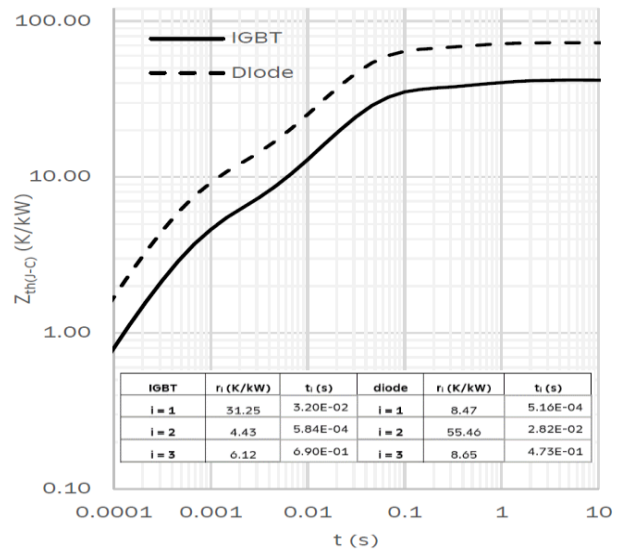


Fig 16. Thermal impedance

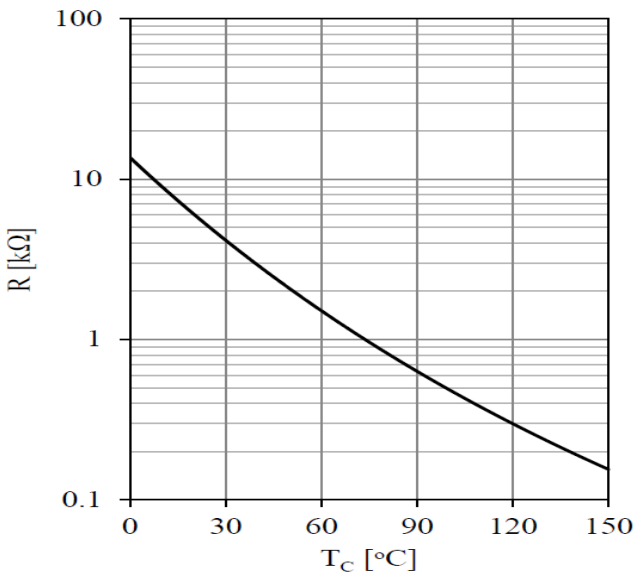


Fig 17. NTC Temperature Characteristic

