SII50N12
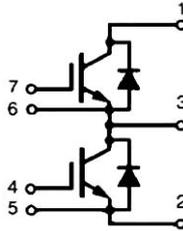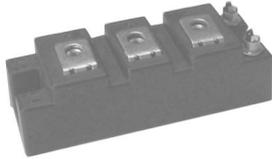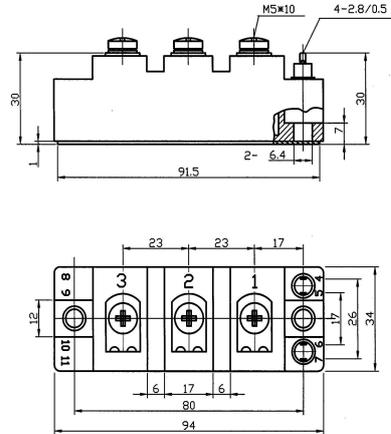
NPT IGBT Modules

Dimensions in mm (1mm = 0.0394")

Absolute Maximum Ratings

$T_C = 25^oC$, unless otherwise specified

Symbol	Conditions	Values	Units
V_{CES}		1200	V
I_C	$T_C = 25(80)^oC$	78(50)	A
I_{CRM}	$T_C = 25(80)^oC$, $t_P = 1ms$	156(100)	A
V_{GES}		±20	V
P_{tot}		400	W
$T_{Vj}, (T_{stg})$	$T_{OPERATION} \leq T_{stg}$	$-40...+125(150)$	^oC
V_{isol}	AC, 1min	2500	V
R_{thJC}		≤ 0.3	K/W
R_{thJCD}		≤ 0.6	

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NPT IGBT Modules

Electeical Characteristics $T_C = 25^oC$, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
Static Characteristics					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2mA$	4.5	5.5	6.5	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = 1200V$; $T_j = 25(125)^oC$		0.8(3.5)	1	mA
I_{GES}	$V_{GE} = 20V$, $V_{CE} = 0$			200	nA
$V_{CE(sat)}$	$I_C = 50A$; $V_{GE} = 15V$; $T_j = 25(125)^oC$; chip level		2.5(3.1)	3(3.7)	V
AC Characteristics					
C_{ies}	under following conditions		3.3		
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25V$, $f = 1MHz$		0.5		nF
C_{res}			0.25		
g_{fs}	$V_{CE}=20V$, $I_C=50A$	23			S
Switching Characteristics					
$t_{d(on)}$	$V_{CC} = 600V$, $I_C = 50A$		44	100	
t_r	$R_{Gon} = R_{Goff} = 22\Omega$, $T_j = 125^oC$		56	100	ns
$t_{d(off)}$	$V_{GE} = \pm 15V$		380	500	
t_f			70	100	
FWD under following conditions:					
V_F	$I_F = 50A$, $V_{GE} = 0V$, $T_j = 25(125)^oC$		2.3(1.8)	2.8	V
t_{rr}	$I_F=50A$, $V_R=-600V$, $V_{GE}=0V$, $di/dt=-800A/us$, $T_j = 125^oC$		0.2		us
Q_{rr}	$I_F = 50A$, $V_{GE} = 0V$, $V_R=-600V$ $di/dt=-800A/us$, $T_j = 25(125)^oC$		2.8(8)		uC
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M5	2.5		5	Nm
w				160	g

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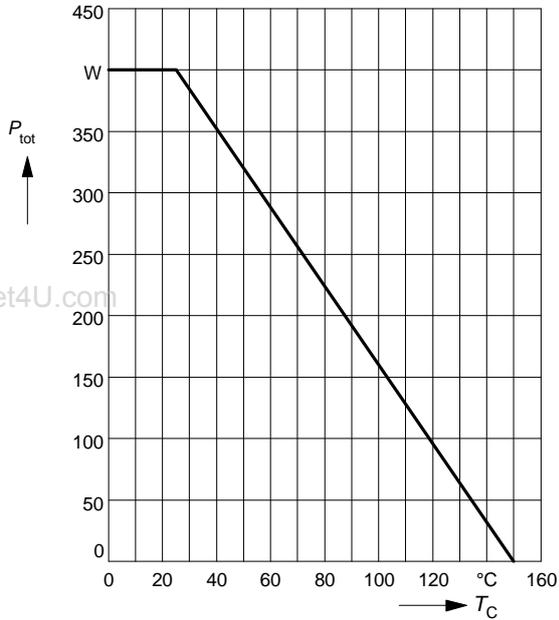# SII50N12

NPT IGBT Modules

Power dissipation

$P_{tot} = f(T_C)$

parameter: $T_j \leq 150\ °C$
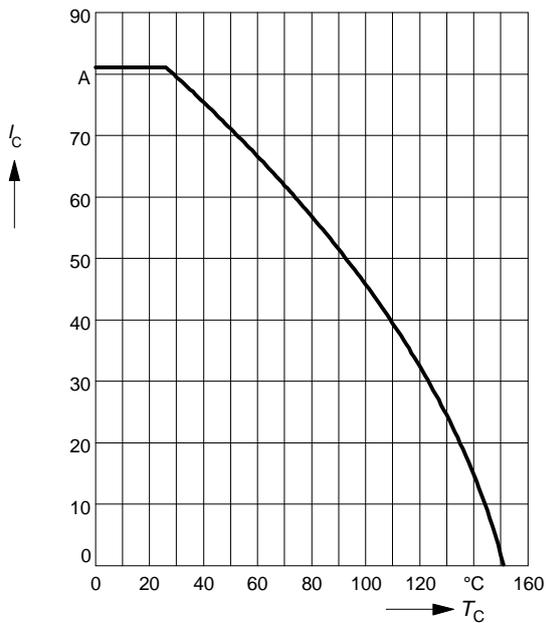

Safe operating area

$I_C = f(V_{CE})$

parameter: $D = 0,\ T_C = 25°C,\ T_j \leq 150\ °C$
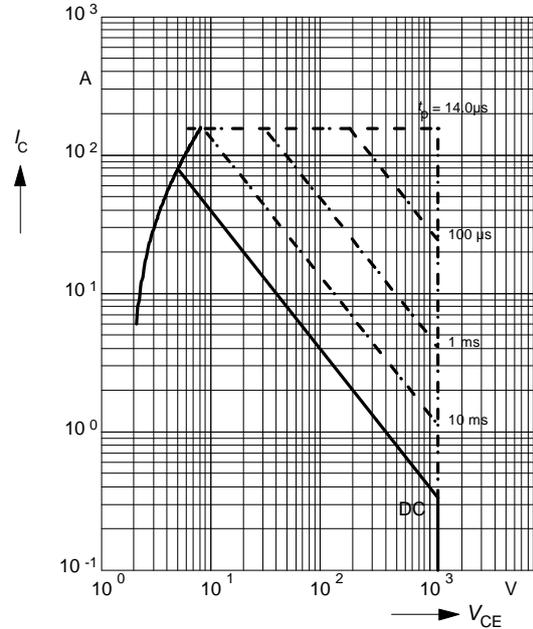
Collector current

$I_C = f(T_C)$

parameter: $V_{GE} \geq 15\ V,\ T_j \leq 150\ °C$

Transient thermal impedance   IGBT

$Z_{th\ JC} = f(t_p)$

parameter: $D = t_p / T$

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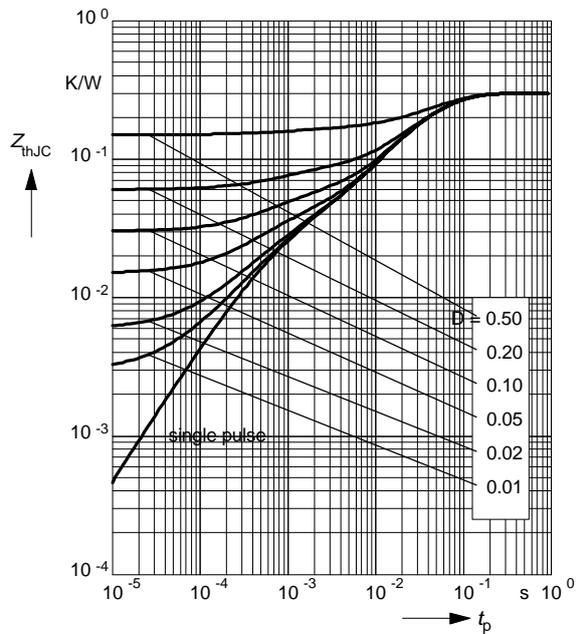
SII50N12

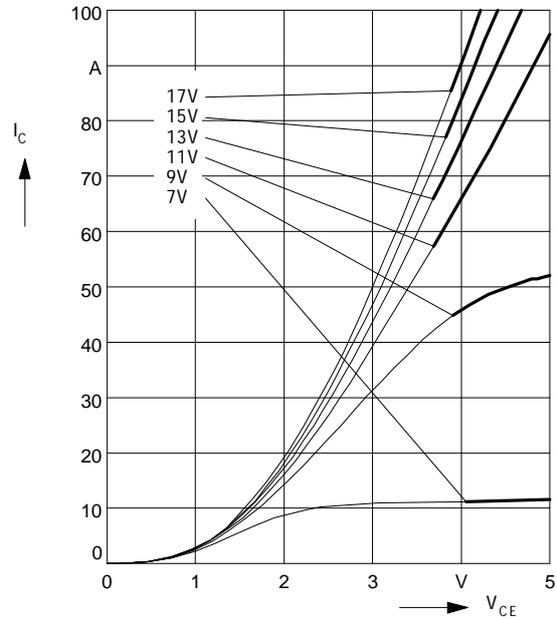## NPT IGBT Modules

Typ. output characteristics
$I_C = f(V_{CE})$
parameter: $t_p = 80\ \mu s$, $T_j = 25\ °C$
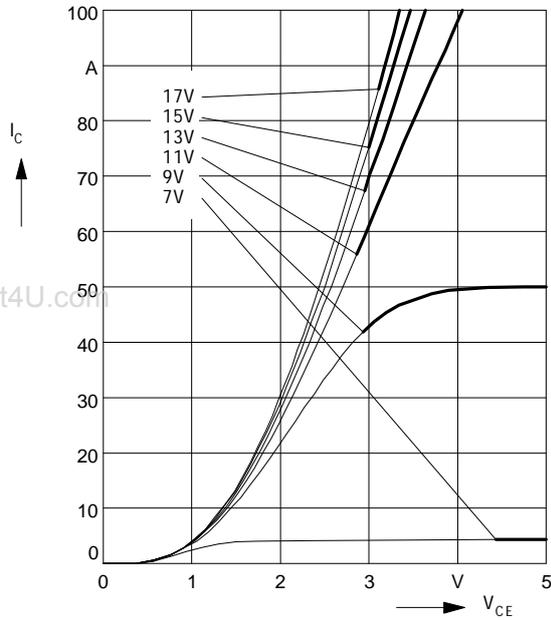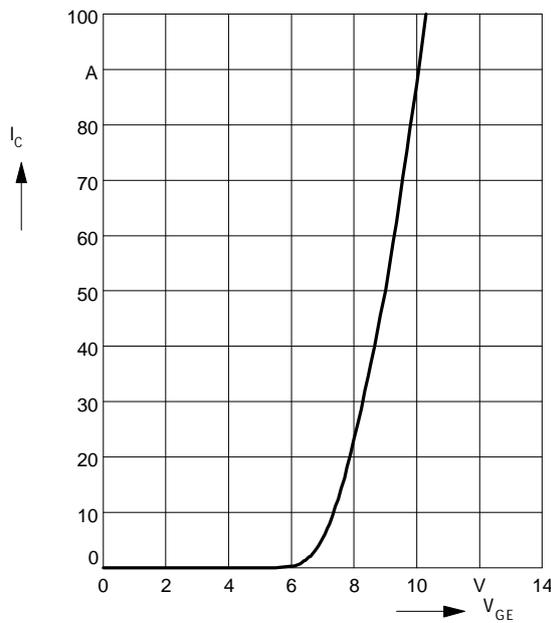
Typ. output characteristics
$I_C = f(V_{CE})$
parameter: $t_p = 80\ \mu s$, $T_j = 125\ °C$

Typ. transfer characteristics
$I_C = f(V_{GE})$
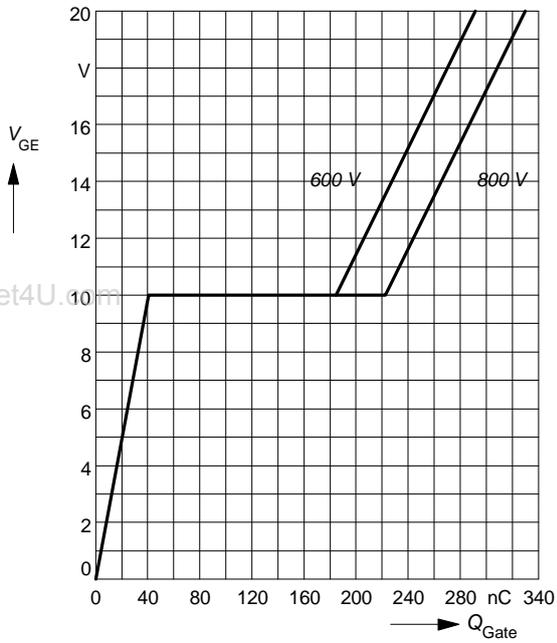parameter: $t_p = 80\ \mu s$, $V_{CE} = 20\ V$

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NPT IGBT Modules

Typ. gate charge

$V_{GE} = f(Q_{Gate})$
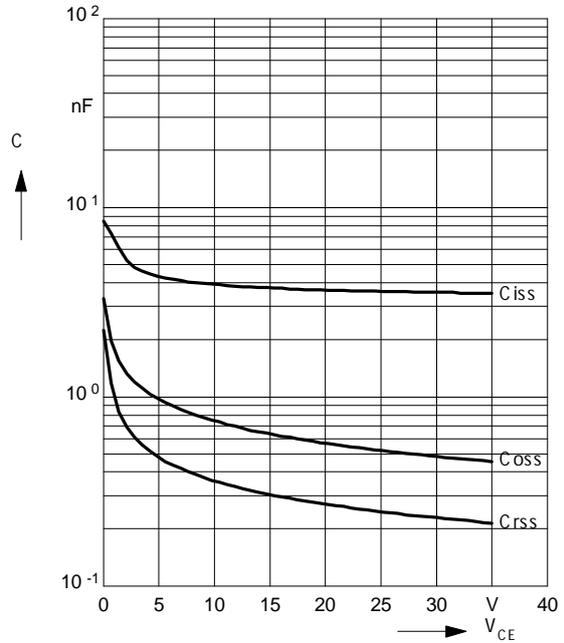
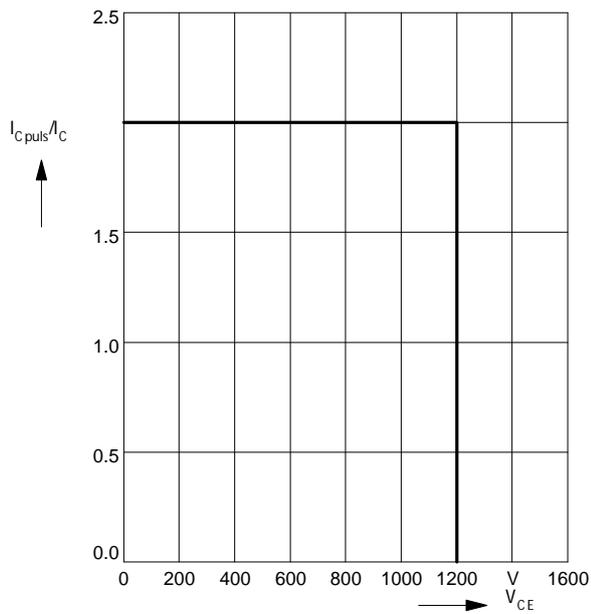parameter: $I_{C\,puls} = 50$ A

Typ. capacitances

$C = f(V_{CE})$

parameter: $V_{GE} = 0$, f = 1 MHz

Reverse biased safe operating area

$I_{C\,puls} = f(V_{CE})$, $T_j = 150°C$
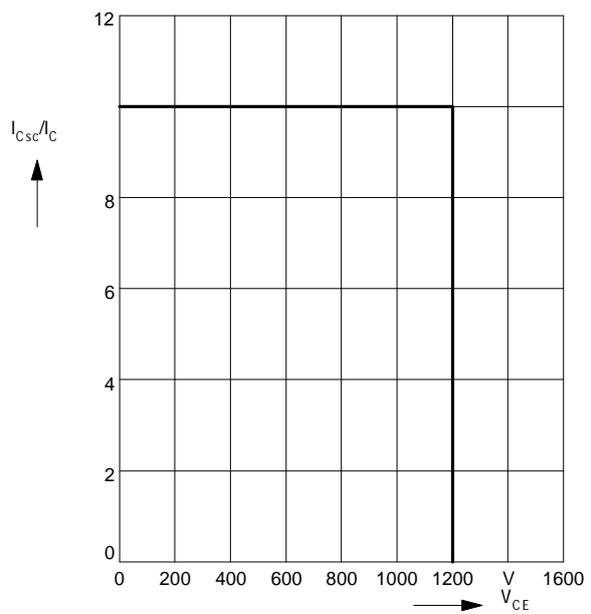
parameter: $V_{GE} = 15$ V

Short circuit safe operating area

$I_{Csc} = f(V_{CE})$, $T_j = 150°C$

parameter: $V_{GE} = \pm 15$ V, $t_{SC} \leq 10$ µs, L < 50 nH

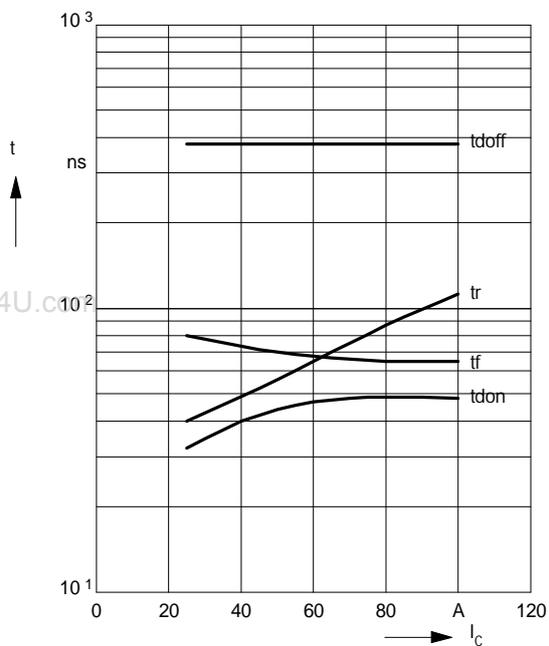**Sirectifier®**

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NPT IGBT Modules

Typ. switching time

I = f (I_C) , inductive load , T_j = 125°C

 par.: V_{CE} = 600 V, V_{GE} = ± 15 V, R_G = 22 Ω

Typ. switching time

t = f (R_G) , inductive load , T_j = 125°C

 par.: V_{CE} = 600 V, V_{GE} = ± 15 V, I_C = 50 A
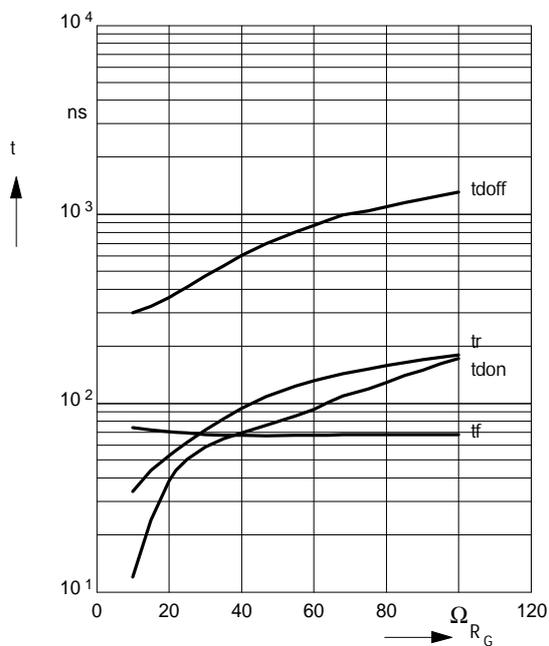
Typ. switching losses

E = f (I_C) , inductive load , T_j = 125°C

 par.: V_{CE} = 600 V, V_{GE} = ± 15 V, R_G = 22 Ω
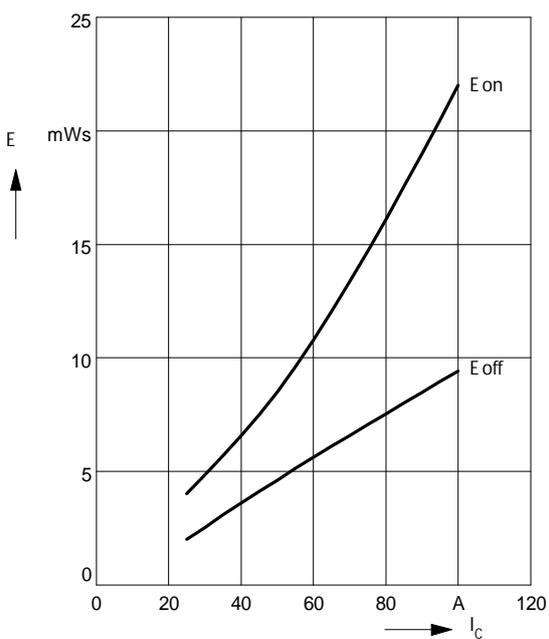
Typ. switching losses

E = f (R_G) , inductive load , T_j = 125°C

 par.: V_{CE} = 600 V, V_{GE} = ± 15 V, I_C = 50 A

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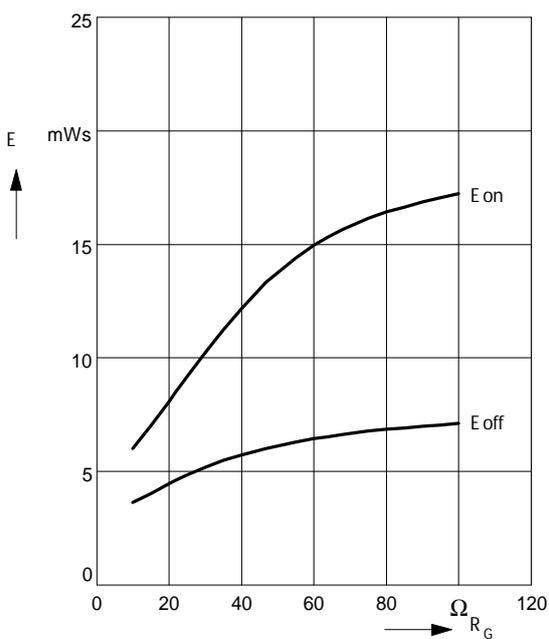
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NPT IGBT Modules

Forward characteristics of fast recovery reverse diode $I_F = f(V_F)$
 parameter: T_j
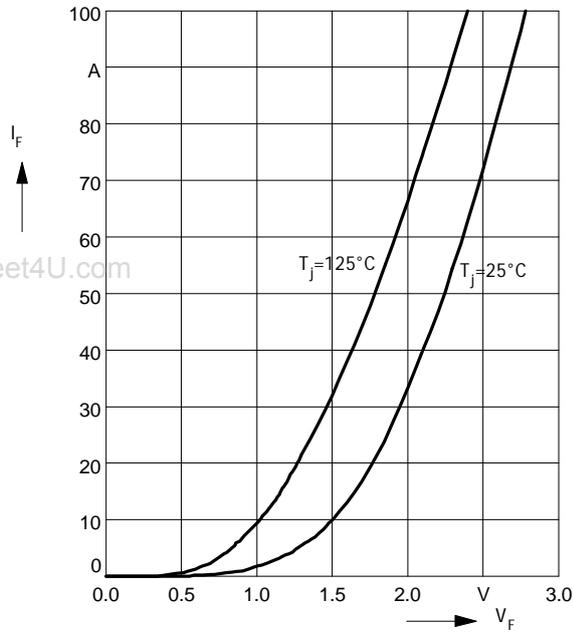
Transient thermal impedance   Diode
$Z_{th\ JC} = f(t_p)$
parameter: $D = t_p / T$

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