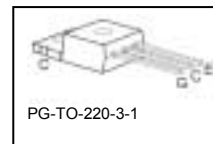
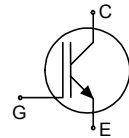


Fast IGBT in NPT-technology

- lower E_{off} compared to previous generation
- Short circuit withstand time – 10 μ s
- Designed for:
 - Motor controls
 - Inverter
 - SMPS
- NPT-Technology offers:
 - very tight parameter distribution
 - high ruggedness, temperature stable behaviour
 - parallel switching capability



- Qualified according to JEDEC¹ for target applications
- Pb-free lead plating; RoHS compliant
- Complete product spectrum and PSpice Models : <http://www.infineon.com/igbt/>

Type	V_{CE}	I_C	E_{off}	T_j	Marking	Package
SGP07N120	1200V	8A	0.7mJ	150°C	GP07N120	PG-TO-220-3-1

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CE}	1200	V
DC collector current	I_C	16.5	A
$T_C = 25^\circ\text{C}$		7.9	
$T_C = 100^\circ\text{C}$			
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpuls}	27	
Turn off safe operating area	-	27	
$V_{CE} \leq 1200\text{V}, T_j \leq 150^\circ\text{C}$			
Gate-emitter voltage	V_{GE}	± 20	V
Avalanche energy, single pulse	E_{AS}	40	mJ
$I_C = 8\text{A}, V_{CC} = 50\text{V}, R_{GE} = 25\Omega$, start at $T_j = 25^\circ\text{C}$			
Short circuit withstand time ²	t_{SC}	10	μ s
$V_{GE} = 15\text{V}, 100\text{V} \leq V_{CC} \leq 1200\text{V}, T_j \leq 150^\circ\text{C}$			
Power dissipation	P_{tot}	125	W
$T_C = 25^\circ\text{C}$			
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ\text{C}$
Soldering temperature, 1.6mm (0.063 in.) from case for 10s	-	260	

¹ J-STD-020 and JESD-022

² Allowed number of short circuits: <1000; time between short circuits: >1s.

Thermal Resistance

Parameter	Symbol	Conditions	Max. Value	Unit
Characteristic				
IGBT thermal resistance, junction – case	R_{thJC}		1	K/W
Thermal resistance, junction – ambient	R_{thJA}	PG-TO-220-3-1	62	

Electrical Characteristic, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V, I_C=500\mu A$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15V, I_C=8A$ $T_j=25^\circ\text{C}$ $T_j=150^\circ\text{C}$	2.5	3.1	3.6	
			-	3.7	4.3	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=350\mu A, V_{CE}=V_{GE}$	3	4	5	
Zero gate voltage collector current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V$ $T_j=25^\circ\text{C}$ $T_j=150^\circ\text{C}$	-	-	100	μA
			-	-	400	
Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V$	-	-	100	nA
Transconductance	g_{fs}	$V_{CE}=20V, I_C=8A$		6	-	S
Dynamic Characteristic						
Input capacitance	C_{iss}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1\text{MHz}$	-	720	870	pF
Output capacitance	C_{oss}		-	60	75	
Reverse transfer capacitance	C_{riss}		-	40	50	
Gate charge	Q_{Gate}	$V_{CC}=960V, I_C=8A$ $V_{GE}=15V$	-	70	90	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	7	-	nH
Short circuit collector current ²⁾	$I_{C(SC)}$	$V_{GE}=15V, t_{SC}\leq 10\mu s$ $100V\leq V_{CC}\leq 1200V,$ $T_j\leq 150^\circ\text{C}$	-	75	-	A

²⁾ Allowed number of short circuits: <1000; time between short circuits: >1s.

Switching Characteristic, Inductive Load, at $T_j=25\text{ }^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
IGBT Characteristic						
Turn-on delay time	$t_{d(on)}$	$T_j=25\text{ }^\circ\text{C}$, $V_{CC}=800\text{V}$, $I_C=8\text{A}$, $V_{GE}=15\text{V}/0\text{V}$, $R_G=47\Omega$, $L_\sigma^{(1)}=180\text{nH}$, $C_\sigma^{(1)}=40\text{pF}$ Energy losses include "tail" and diode reverse recovery.	-	27	35	ns
Rise time	t_r		-	29	38	
Turn-off delay time	$t_{d(off)}$		-	440	570	
Fall time	t_f		-	21	27	
Turn-on energy	E_{on}		-	0.6	0.8	mJ
Turn-off energy	E_{off}		-	0.4	0.55	
Total switching energy	E_{ts}		-	1.0	1.35	

Switching Characteristic, Inductive Load, at $T_j=150\text{ }^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
IGBT Characteristic						
Turn-on delay time	$t_{d(on)}$	$T_j=150\text{ }^\circ\text{C}$ $V_{CC}=800\text{V}$, $I_C=8\text{A}$, $V_{GE}=15\text{V}/0\text{V}$, $R_G=47\Omega$, $L_\sigma^{(1)}=180\text{nH}$, $C_\sigma^{(1)}=40\text{pF}$ Energy losses include "tail" and diode reverse recovery.	-	30	36	ns
Rise time	t_r		-	26	31	
Turn-off delay time	$t_{d(off)}$		-	490	590	
Fall time	t_f		-	30	36	
Turn-on energy	E_{on}		-	1.0	1.2	mJ
Turn-off energy	E_{off}		-	0.7	0.9	
Total switching energy	E_{ts}		-	1.7	2.1	

¹⁾ Leakage inductance L_σ and stray capacity C_σ due to dynamic test circuit in figure E.

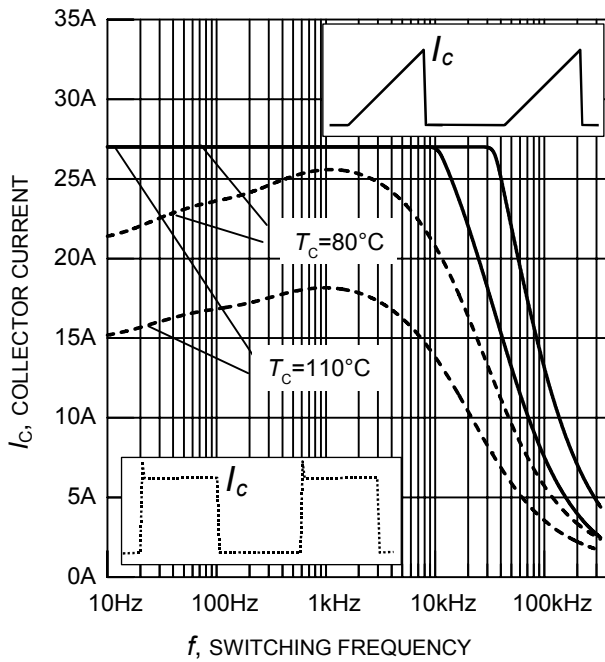


Figure 1. Collector current as a function of switching frequency

($T_j \leq 150^\circ\text{C}$, $D = 0.5$, $V_{CE} = 800\text{V}$, $V_{GE} = +15\text{V}/0\text{V}$, $R_G = 47\Omega$)

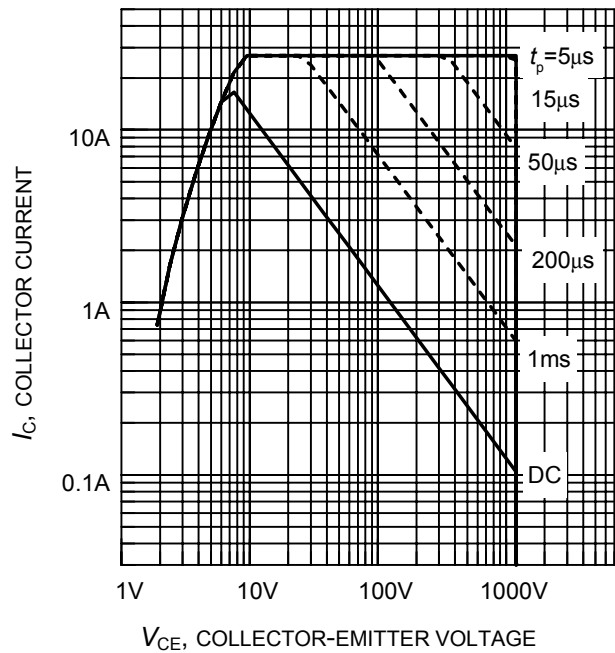


Figure 2. Safe operating area

($D = 0$, $T_C = 25^\circ\text{C}$, $T_j \leq 150^\circ\text{C}$)

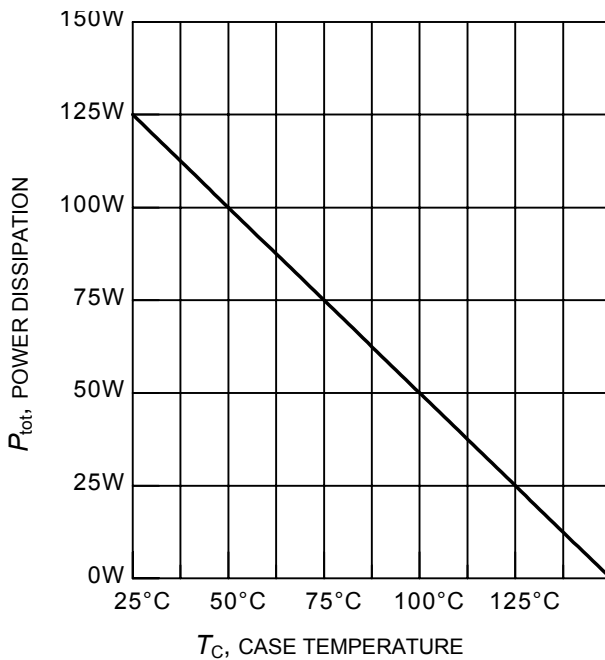


Figure 3. Power dissipation as a function of case temperature

($T_j \leq 150^\circ\text{C}$)

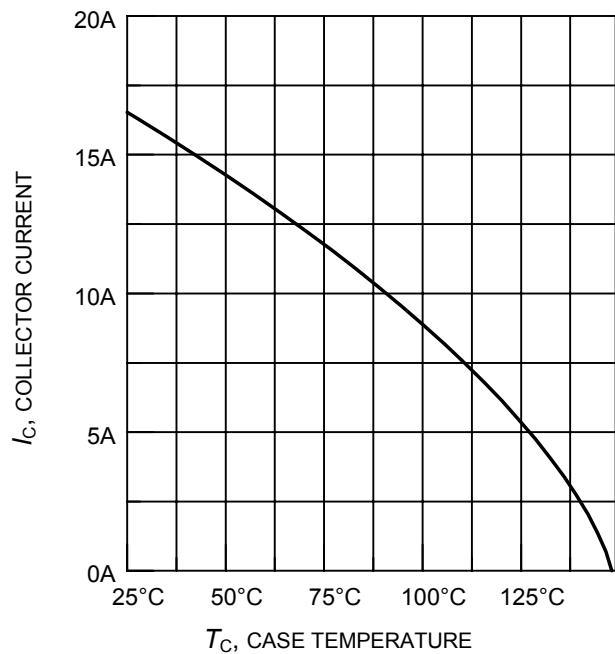


Figure 4. Collector current as a function of case temperature

($V_{GE} \leq 15\text{V}$, $T_j \leq 150^\circ\text{C}$)

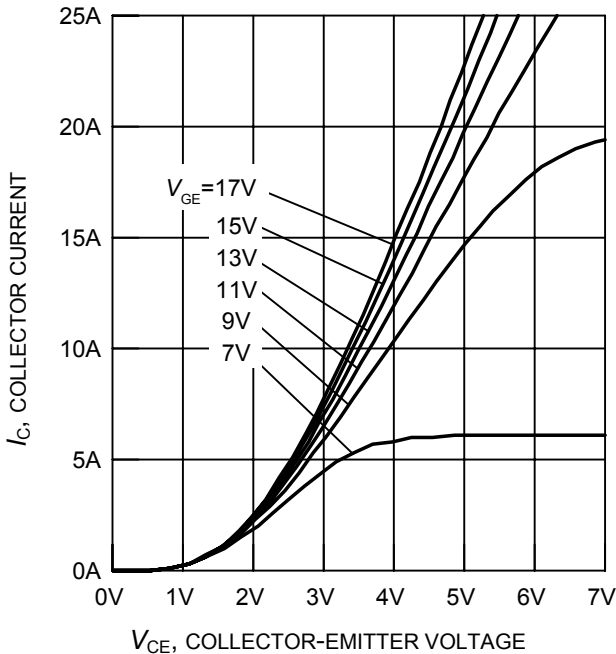


Figure 5. Typical output characteristics
($T_j = 25^\circ\text{C}$)

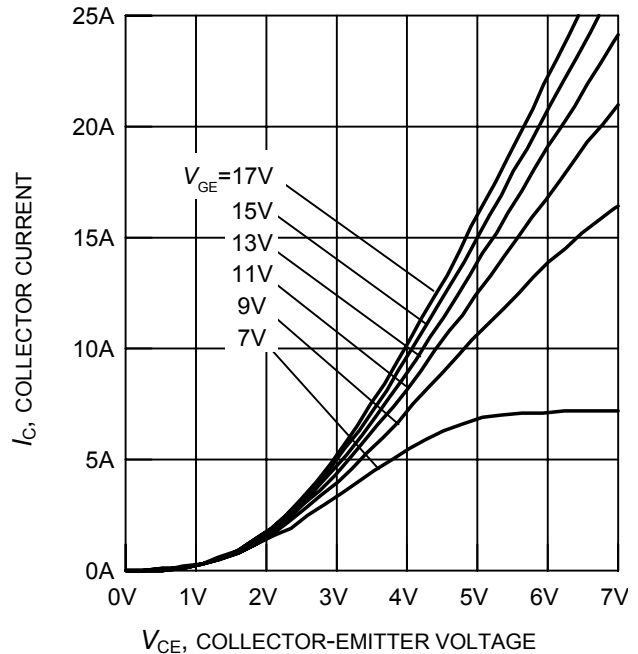


Figure 6. Typical output characteristics
($T_j = 150^\circ\text{C}$)

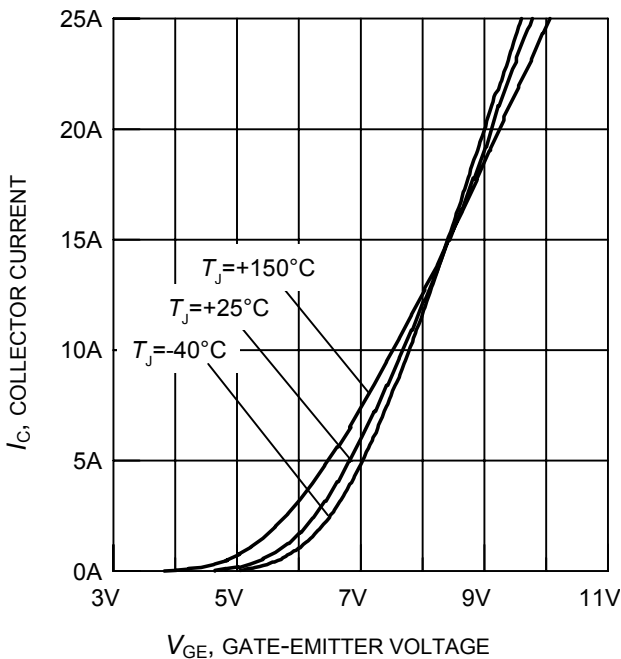


Figure 7. Typical transfer characteristics
($V_{CE} = 20\text{V}$)

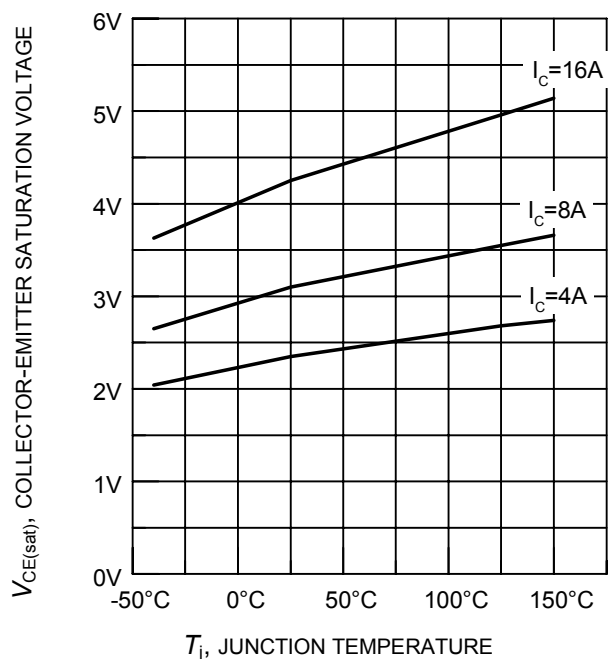


Figure 8. Typical collector-emitter saturation voltage as a function of junction temperature
($V_{GE} = 15\text{V}$)

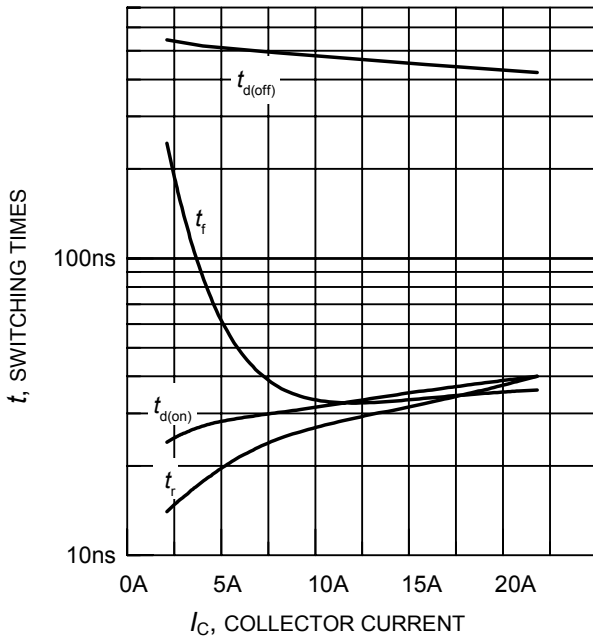


Figure 9. Typical switching times as a function of collector current
 (inductive load, $T_j = 150^\circ\text{C}$,
 $V_{CE} = 800\text{V}$, $V_{GE} = +15\text{V}/0\text{V}$, $R_G = 47\Omega$,
 dynamic test circuit in Fig.E)

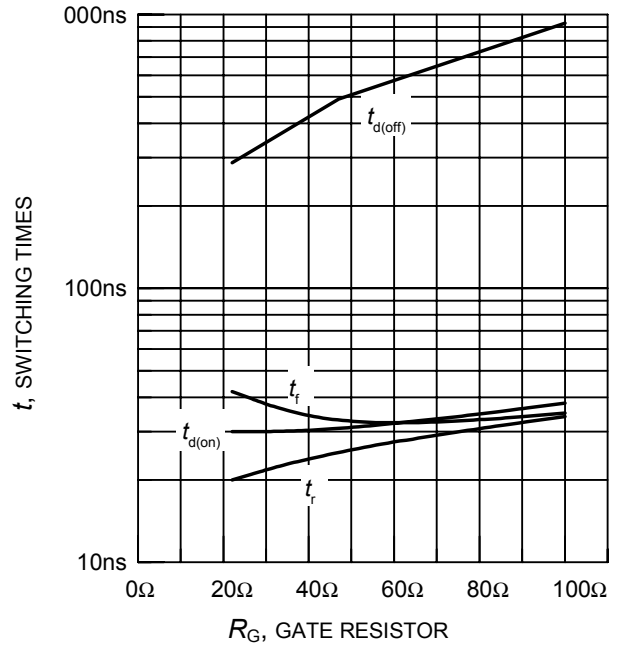


Figure 10. Typical switching times as a function of gate resistor
 (inductive load, $T_j = 150^\circ\text{C}$,
 $V_{CE} = 800\text{V}$, $V_{GE} = +15\text{V}/0\text{V}$, $I_C = 8\text{A}$,
 dynamic test circuit in Fig.E)

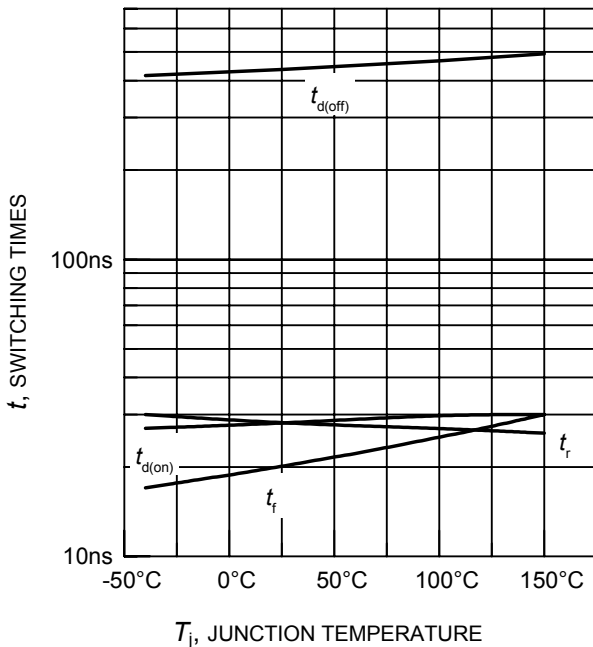


Figure 11. Typical switching times as a function of junction temperature
 (inductive load, $V_{CE} = 800\text{V}$,
 $V_{GE} = +15\text{V}/0\text{V}$, $I_C = 8\text{A}$, $R_G = 47\Omega$,
 dynamic test circuit in Fig.E)

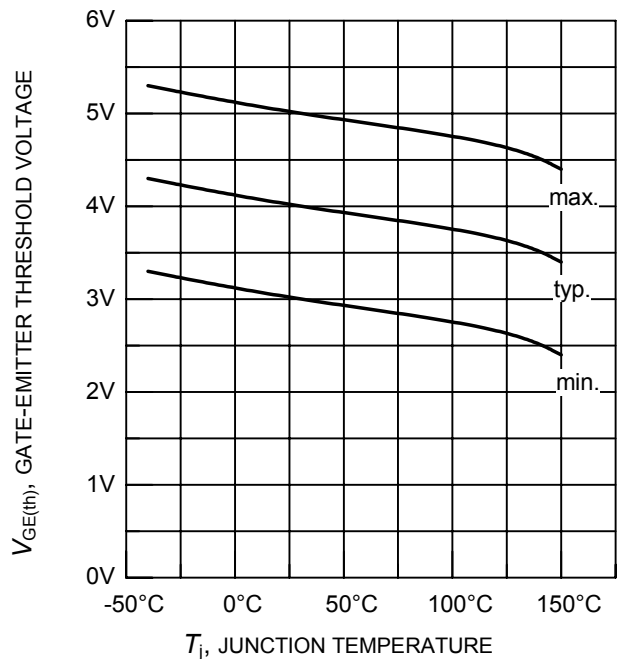


Figure 12. Gate-emitter threshold voltage as a function of junction temperature
 ($I_C = 0.3\text{mA}$)

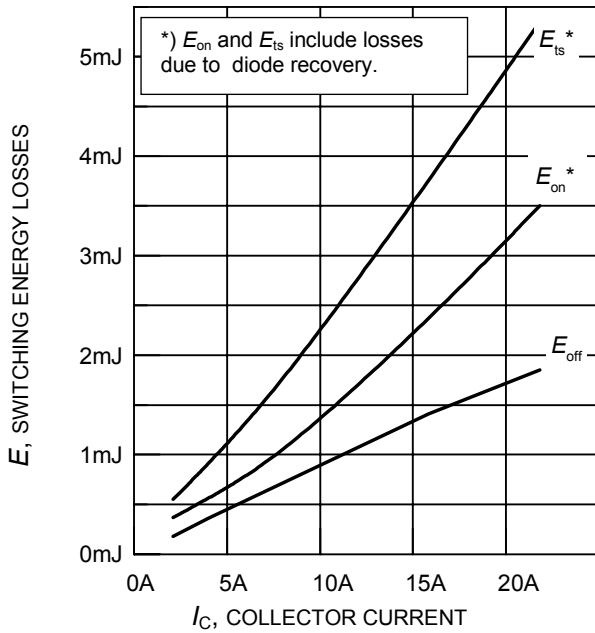


Figure 13. Typical switching energy losses as a function of collector current
 (inductive load, $T_j = 150^\circ\text{C}$, $V_{CE} = 800\text{V}$, $V_{GE} = +15\text{V}/0\text{V}$, $R_G = 47\ \Omega$, dynamic test circuit in Fig.E)

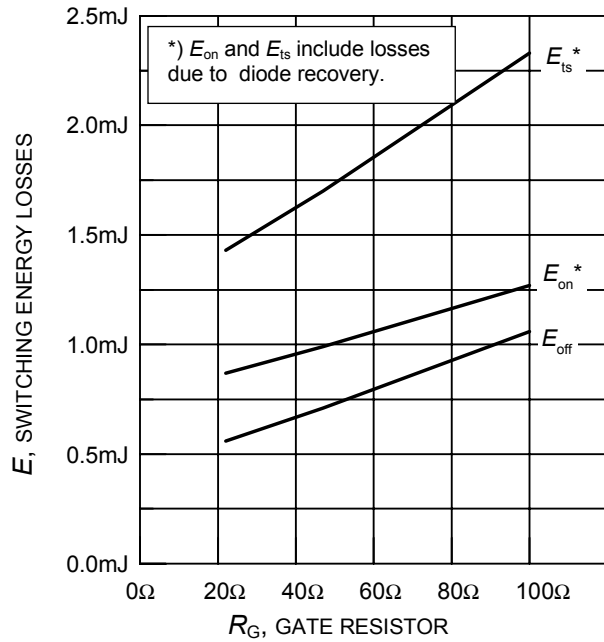


Figure 14. Typical switching energy losses as a function of gate resistor
 (inductive load, $T_j = 150^\circ\text{C}$, $V_{CE} = 800\text{V}$, $V_{GE} = +15\text{V}/0\text{V}$, $I_C = 8\text{A}$, dynamic test circuit in Fig.E)

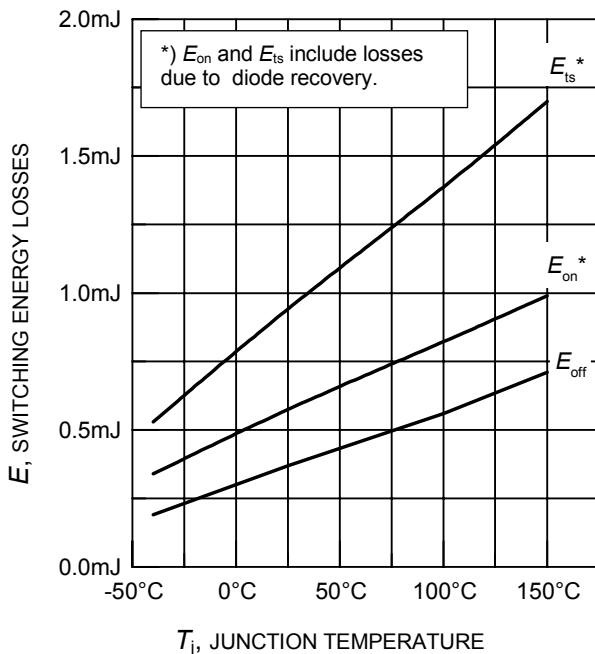


Figure 15. Typical switching energy losses as a function of junction temperature
 (inductive load, $V_{CE} = 800\text{V}$, $V_{GE} = +15\text{V}/0\text{V}$, $I_C = 8\text{A}$, $R_G = 47\ \Omega$, dynamic test circuit in Fig.E)

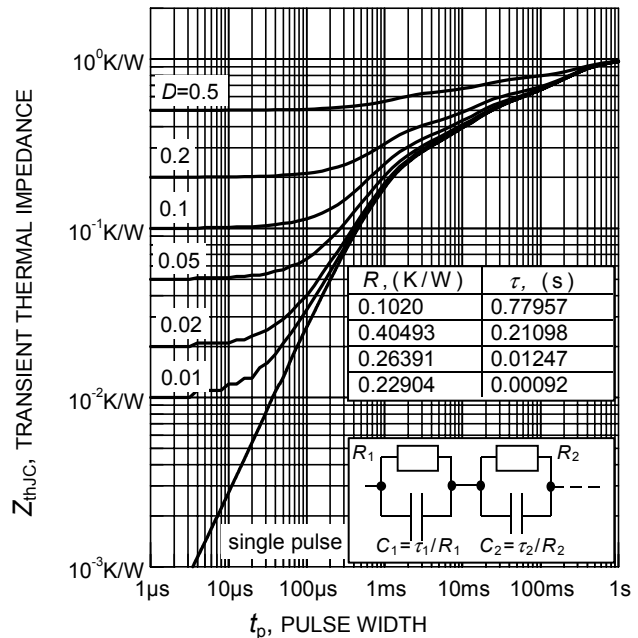


Figure 16. IGBT transient thermal impedance as a function of pulse width
 ($D = t_p / T$)

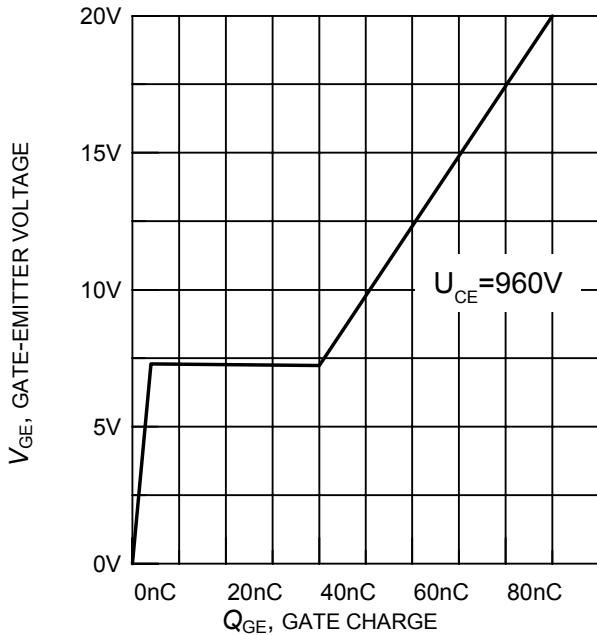


Figure 17. Typical gate charge
($I_C = 8A$)

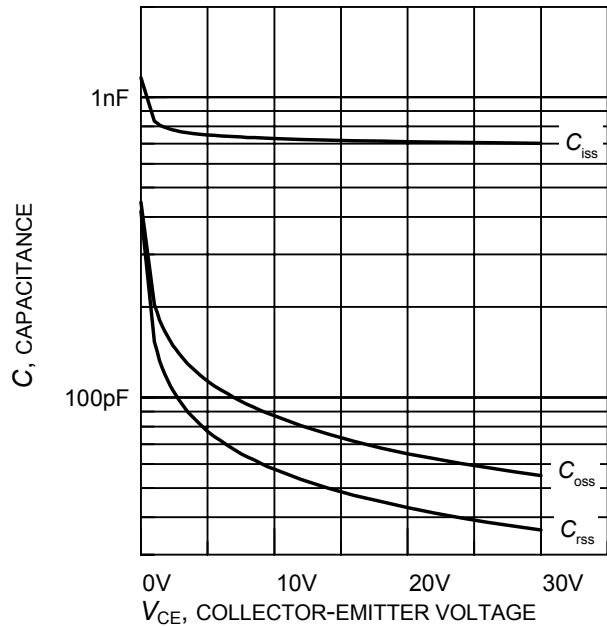


Figure 18. Typical capacitance as a function of collector-emitter voltage
($V_{GE} = 0V, f = 1MHz$)

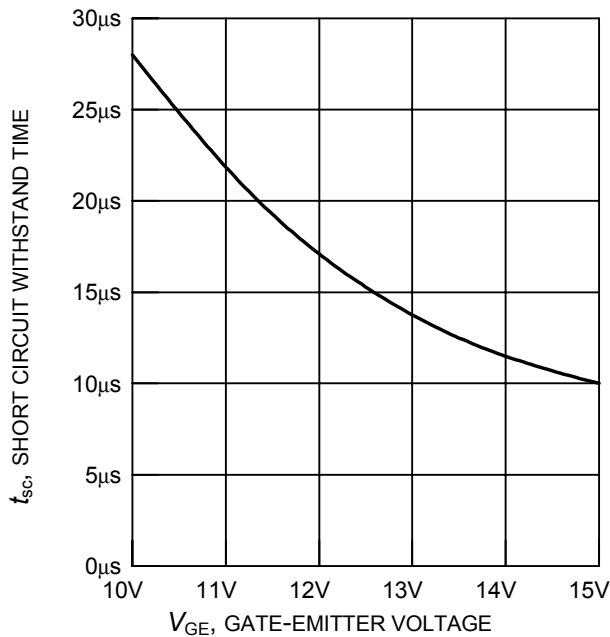


Figure 19. Short circuit withstand time as a function of gate-emitter voltage
($V_{CE} = 1200V, \text{start at } T_j = 25^\circ C$)

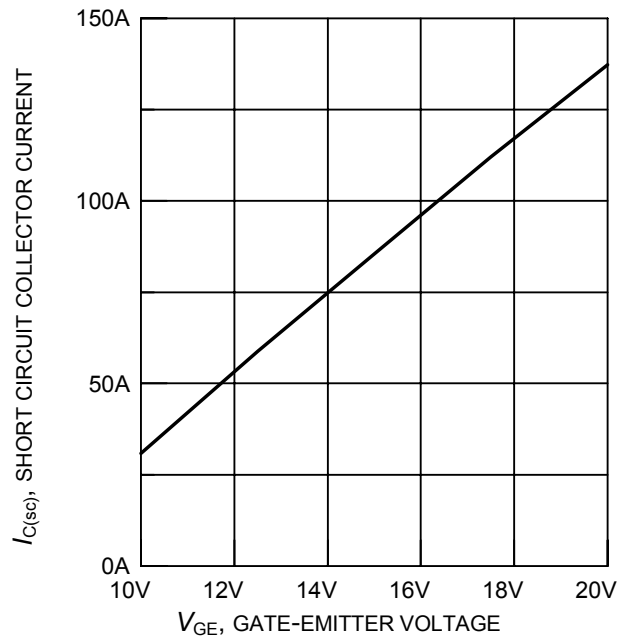
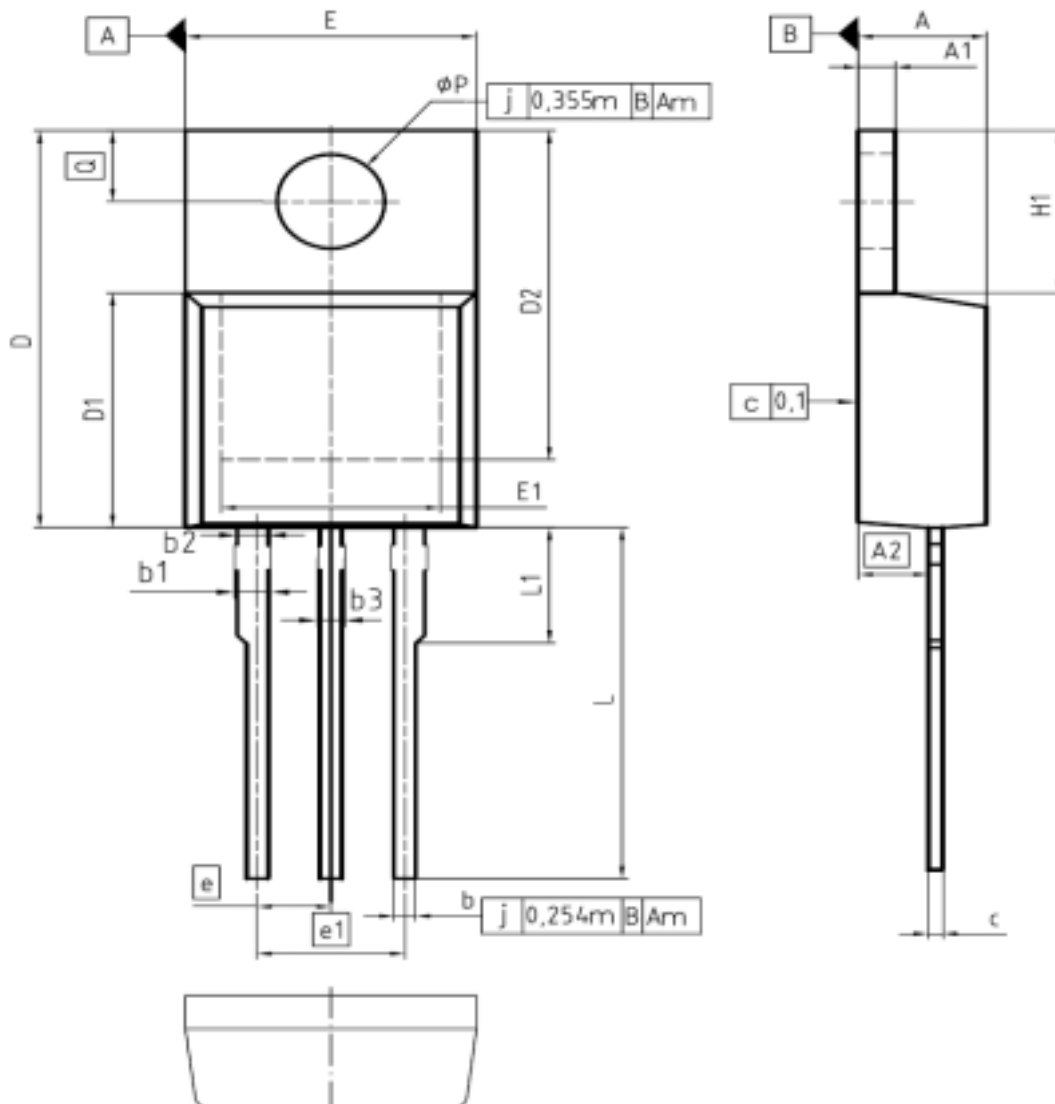


Figure 20. Typical short circuit collector current as a function of gate-emitter voltage
($100V \leq V_{CE} \leq 1200V, T_C = 25^\circ C, T_j \leq 150^\circ C$)

PG-TO220-3-1



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.57	0.169	0.180
A1	1.17	1.40	0.046	0.055
A2	2.15	2.72	0.085	0.107
b	0.65	0.86	0.026	0.034
b1	0.95	1.40	0.037	0.055
b2	0.95	1.15	0.037	0.045
b3	0.65	1.15	0.026	0.045
c	0.33	0.60	0.013	0.024
D	14.81	15.95	0.583	0.628
D1	8.51	9.45	0.335	0.372
D2	12.19	13.10	0.480	0.516
E	9.70	10.36	0.382	0.408
E1	6.50	8.60	0.256	0.339
e	2.54		0.100	
e1	5.08		0.200	
N	3		3	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	-	4.80	-	0.189
eP	3.60	3.89	0.142	0.153
Q	2.60	3.00	0.102	0.118

DOCUMENT NO.
Z8B00003318

SCALE

EUROPEAN PROJECTION

ISSUE DATE
23-08-2007

REVISION
05

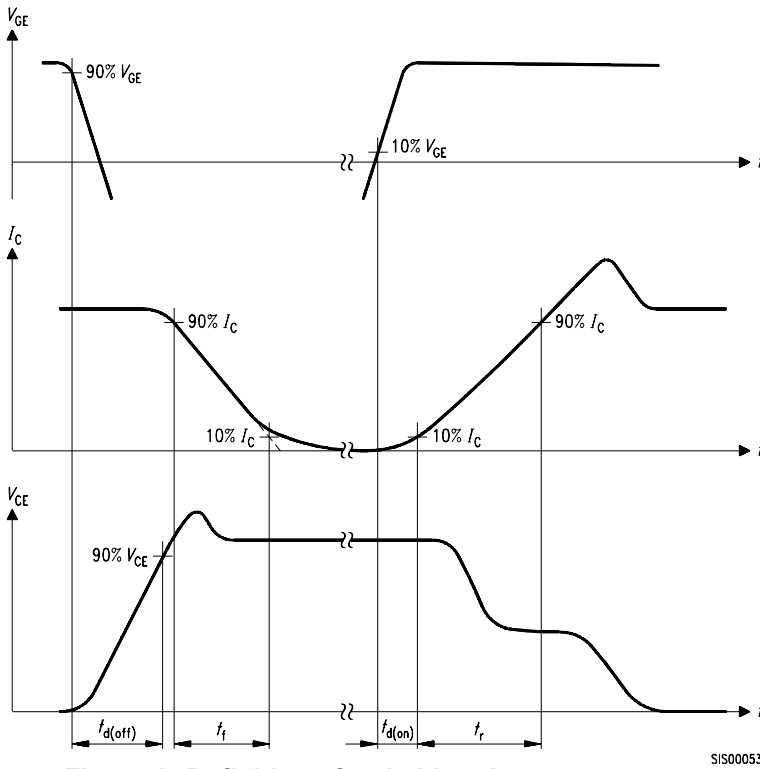


Figure A. Definition of switching times

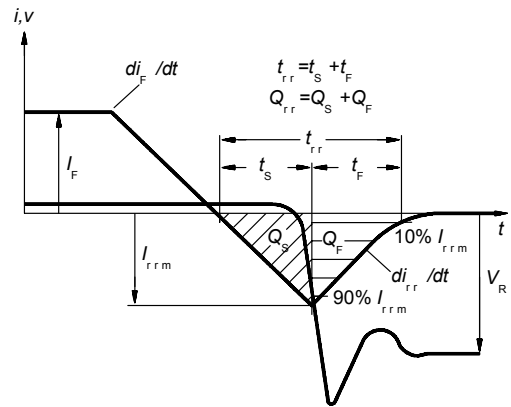


Figure C. Definition of diodes switching characteristics

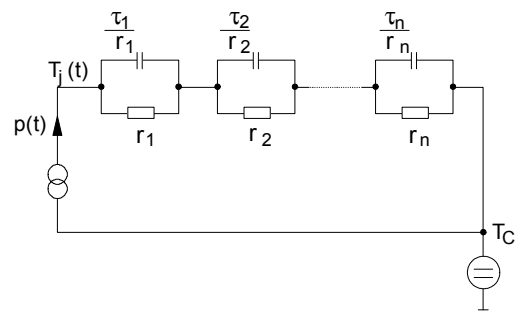


Figure D. Thermal equivalent circuit

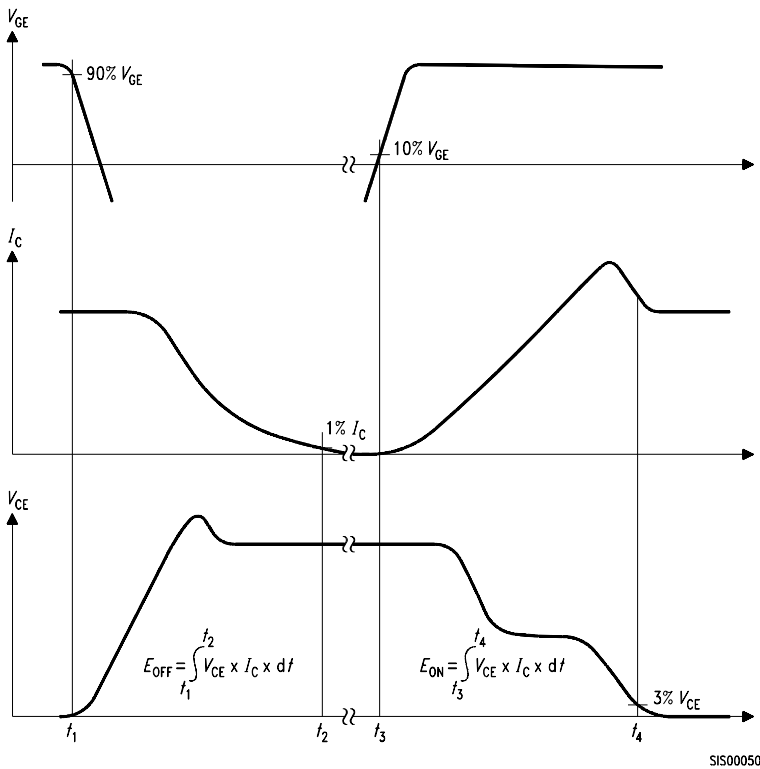


Figure B. Definition of switching losses

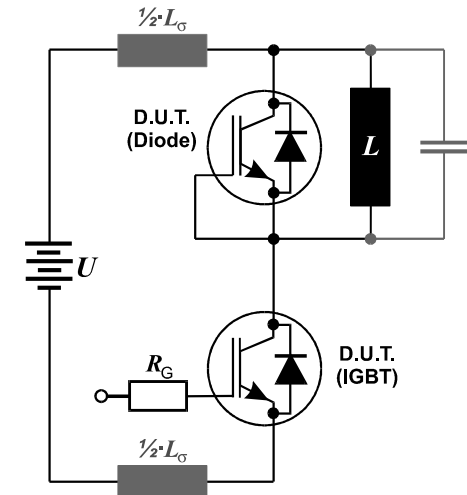


Figure E. Dynamic test circuit
Leakage inductance $L_\sigma=180\text{nH}$,
and stray capacity $C_\sigma=40\text{pF}$.

Edition 2006-01

**Published by
Infineon Technologies AG
81726 München, Germany**

© Infineon Technologies AG 9/12/07.

All Rights Reserved.

Attention please!

The information given in this data sheet shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie"). With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (www.infineon.com).

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкуренеспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru