Diode

Fast Switching Emitter Controlled Diode

IDV30E60C

FullPAK with Emitter Controlled Diode

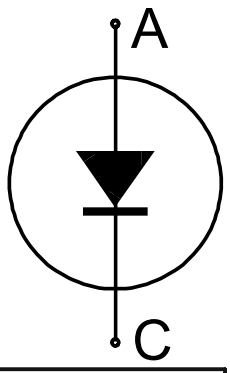
Datasheet

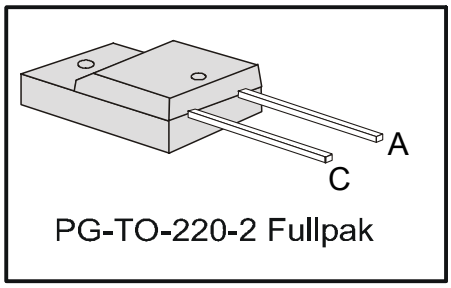
Industrial & Multimarket

Fast Switching Emitter Controlled Diode

Features:

- Electrically isolated FullPAK for easy assembly
- 600 V Emitter Controlled technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- Easy paralleling
- Qualified according to JESD-022 for target applications
- Pb-free lead plating; RoHS compliant
- Halogen free (according to IEC 61249-2-21)
- Complete product spectrum and PSpice Models: http://www.infineon.com/diode/





PG-TO-220-2 Fullpak

Applications:

- Switching diode for PFC applications with operating range up to 30kHz

Green

Halogen-Free

RoHS

Key Performance and Package Parameters

Type	V_{rrm}	I_f	V_f, T_{vj}=25°C	T_{vjmax}	Marking	Package
IDV30E60C	600V	30A	1.65V	175°C	D30E60C	PG-TO220-2-22 FP

Table of Contents

Maximum ratings

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	600	V
Diode forward current, limited by T_{vjmax} T_C = 25°C T_C = 100°C	I_F	 21.0 12.0	A
Diode pulsed current, t_p limited by T_{vjmax}	I_{Fpuls}	90.0	A
Power dissipation T_C = 25°C	P_{tot}	37.0	W
Operating junction temperature	T_{vj}	-40...+175	°C
Storage temperature	T_{stg}	-55...+150	°C
Soldering temperature, wave soldering 1.6 mm (0.063 in.) from case for 10s		260	°C
Mounting torque, M3 screw Maximum of mounting processes: 3	M	0.6	Nm

Thermal Resistance

Parameter	Symbol	Conditions	Max. Value	Unit
Characteristic				
Diode thermal resistance,[1)] junction - case	$R_{th(j-c)}$		4.00	K/W
Thermal resistance junction - ambient	$R_{th(j-a)}$		65	K/W

Electrical Characteristic, at T_{vj} = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Diode forward voltage	V_F	I_F = 30.0A T_{vj} = 25°C T_{vj} = 175°C	 - -	 1.65 1.65	 2.05	V
Reverse leakage current	I_R	V_R = 600V T_{vj} = 25°C T_{vj} = 175°C	 - -	 - -	 40.0 1000.0	µA

Electrical Characteristic, at T_{vj} = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Dynamic Characteristic						
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	7.0	-	nH

Switching Characteristic, Inductive Load, at T_{vj} = 25°C

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	

[1)] Please be aware that in non standard load conditions, due to high Rth(j-c), Tvj close to Tvjmax can be reached.

Diode Characteristic, at T_{vj} = 25°C

Diode reverse recovery time	t_{rr}	T_{vj} = 25°C, V_R = 400V, I_F = 30.0A, di_F/dt = 1000A/µs	-	130	-	ns
Diode reverse recovery charge	Q_{rr}		-	0.88	-	µC
Diode peak reverse recovery current	I_{rrm}		-	16.9	-	A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt		-	-598	-	A/µs

Switching Characteristic, Inductive Load, at T_{vj} = 175°C

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	

Diode Characteristic, at T_{vj} = 175°C

Diode reverse recovery time	t_{rr}	T_{vj} = 175°C, V_R = 400V, I_F = 30.0A, di_F/dt = 1000A/µs	-	217	-	ns
Diode reverse recovery charge	Q_{rr}		-	2.40	-	µC
Diode peak reverse recovery current	I_{rrm}		-	22.9	-	A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt		-	-307	-	A/µs

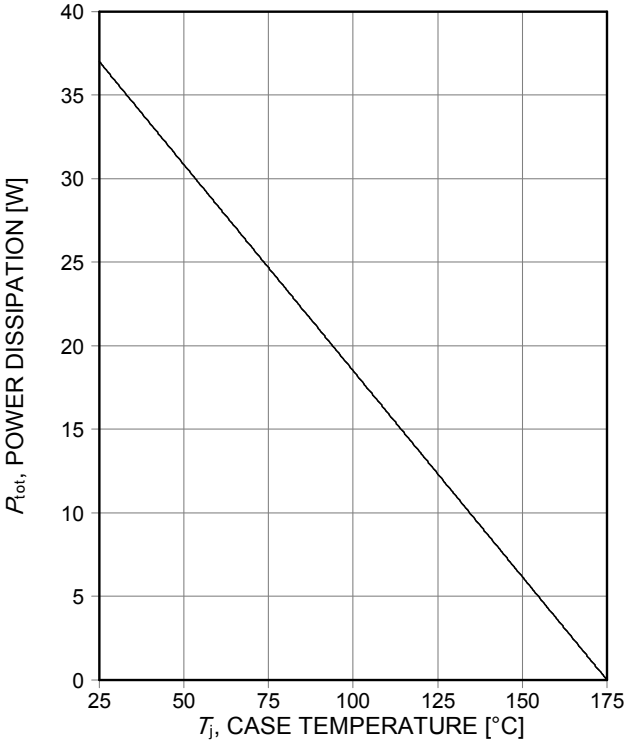


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175°C$)

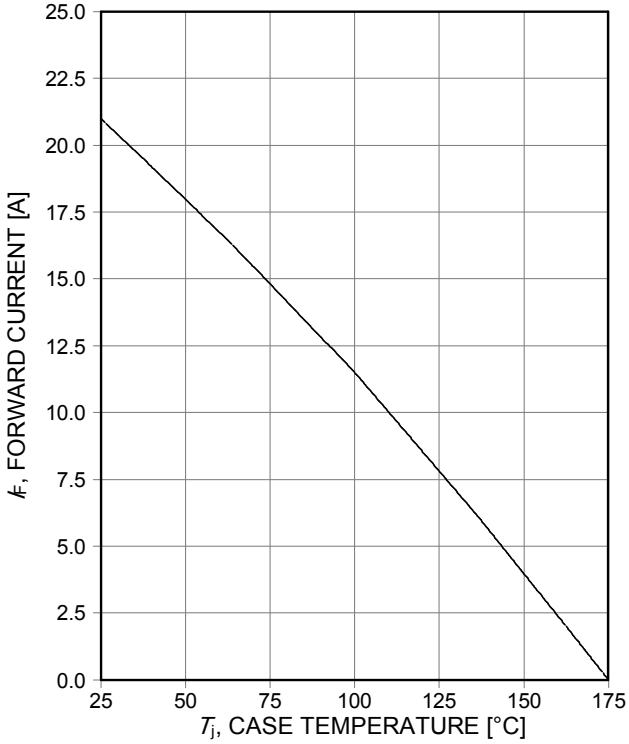


Figure 2. Diode forward current as a function of case temperature
($V_{GE} \geq 15V$, $T_j \leq 175°C$)

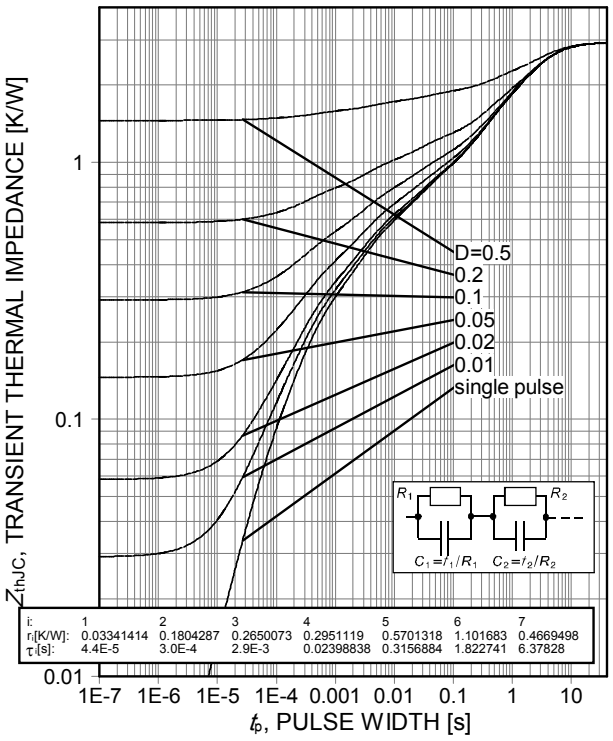


Figure 3. Diode transient thermal impedance as a function of pulse width
($D=t_p/T$)

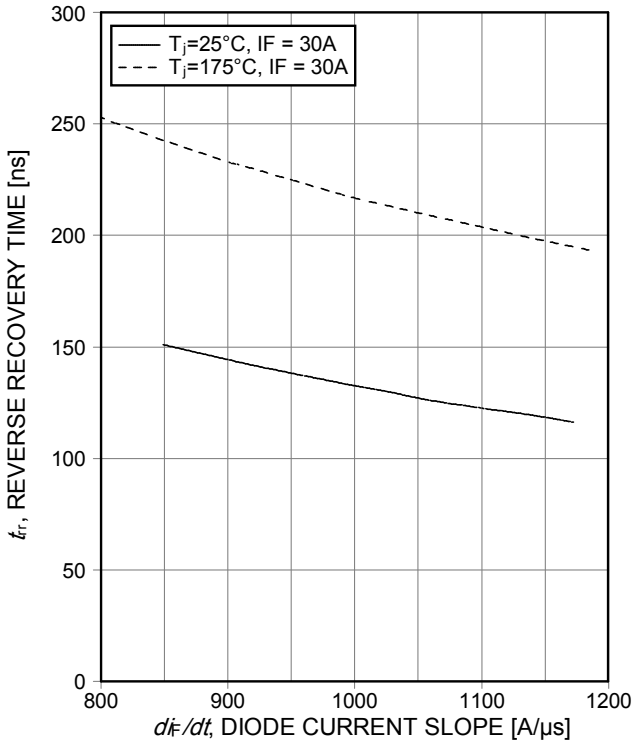


Figure 4. Typical reverse recovery time as a function of diode current slope
(V_R=400V, I_F=30A, Dynamic test circuit in Figure E)

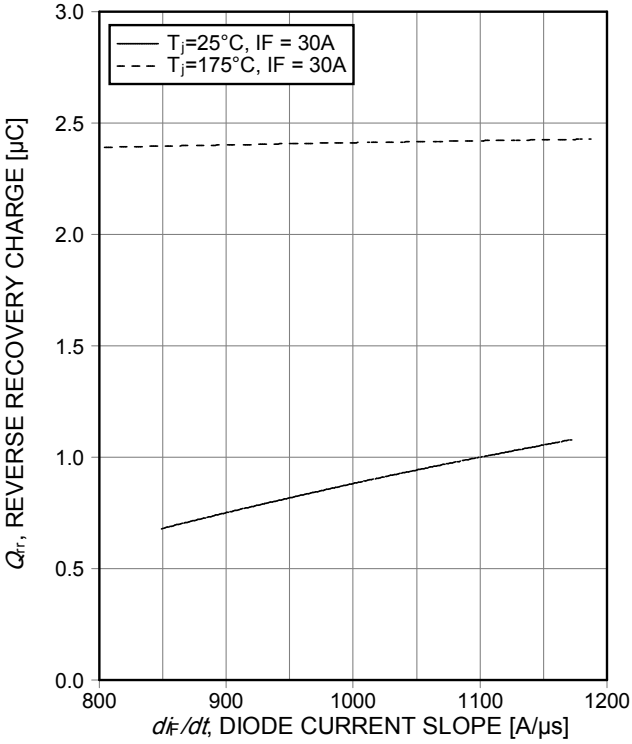


Figure 5. Typical reverse recovery charge as a function of diode current slope
(V_R=400V, I_F=30A, Dynamic test circuit in Figure E)

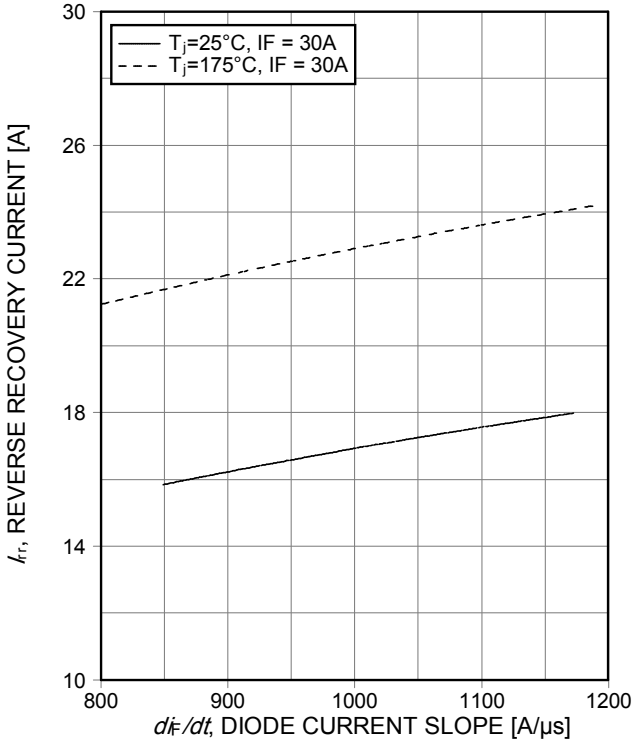


Figure 6. Typical reverse recovery current as a function of diode current slope
(V_R=400V, I_F=30A, Dynamic test circuit in Figure E)

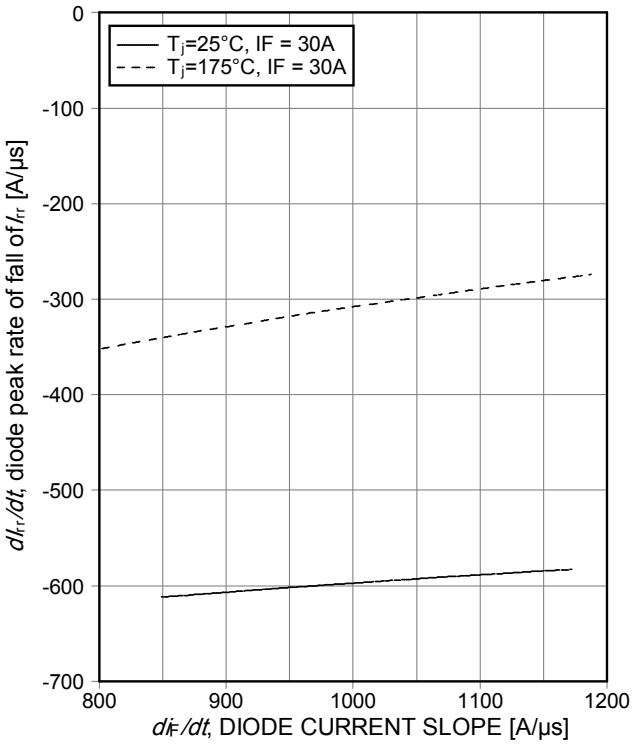


Figure 7. Typical diode peak rate of fall of reverse recovery current as a function of diode current slope
(V_R=400V, I_F=30A, Dynamic test circuit in Figure E)

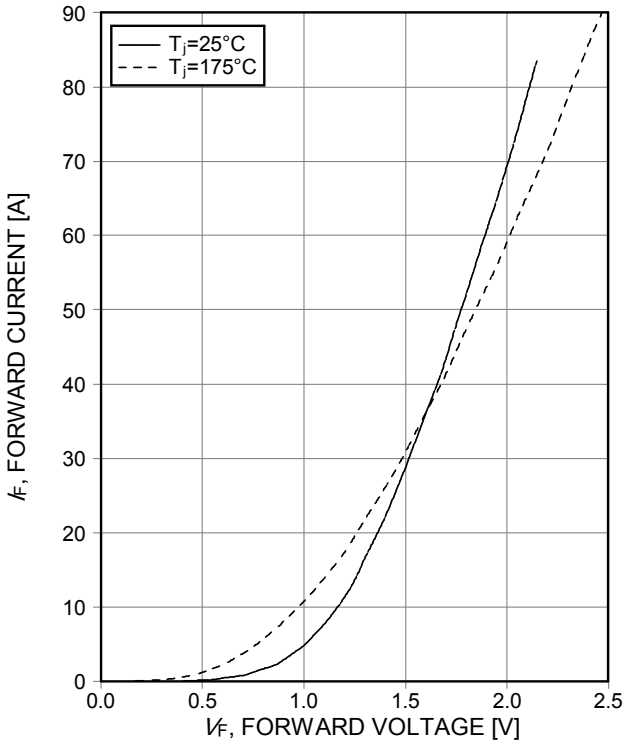


Figure 8. Typical diode forward current as a function of forward voltage

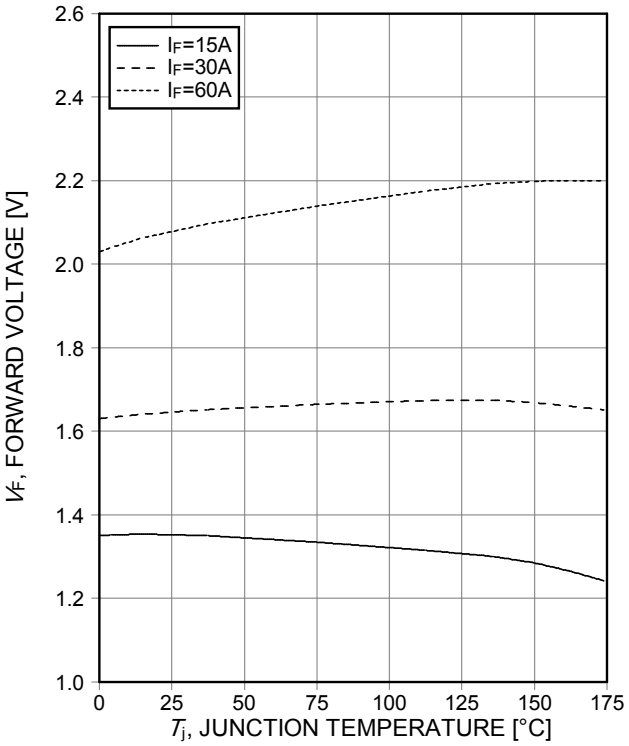
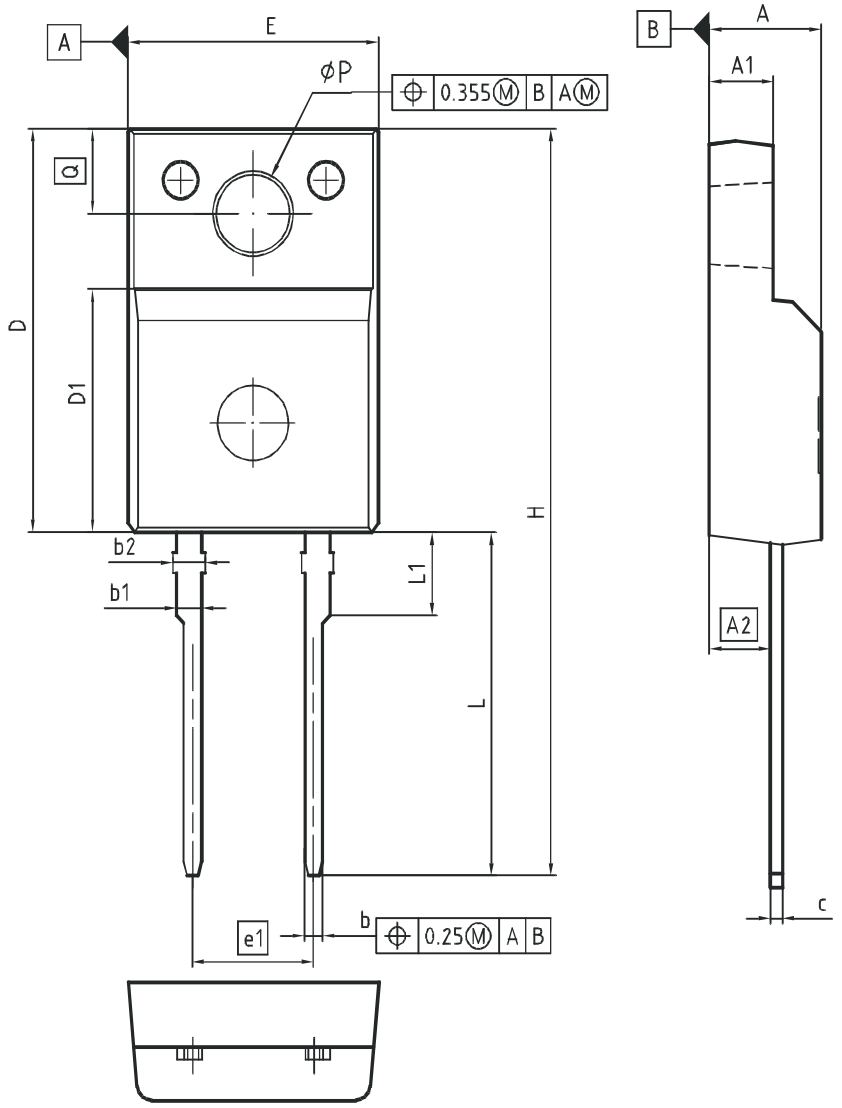


Figure 9. Typical diode forward voltage as a function of junction temperature

PG-TO220-2-22



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.55	4.85	0.179	0.191
A1	2.55	2.85	0.100	0.112
A2	2.42	2.72	0.095	0.107
b	0.65	0.85	0.026	0.033
b1	0.95	1.15	0.037	0.045
b2	0.95	1.35	0.037	0.053
c	0.40	0.60	0.016	0.024
D	15.85	16.15	0.624	0.636
D1	9.53	9.83	0.375	0.387
E	10.35	10.65	0.407	0.419
e1	5.08		0.200	
N	2		2	
H	29.30	29.90	1.154	1.177
L	13.45	13.75	0.530	0.541
L1	3.15	3.45	0.124	0.136
øP	3.00	3.20	0.118	0.126
Q	3.20	3.50	0.126	0.138

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SCALE 0 2.5 0 2.5 5mm

EUROPEAN PROJECTION

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REVISION
01

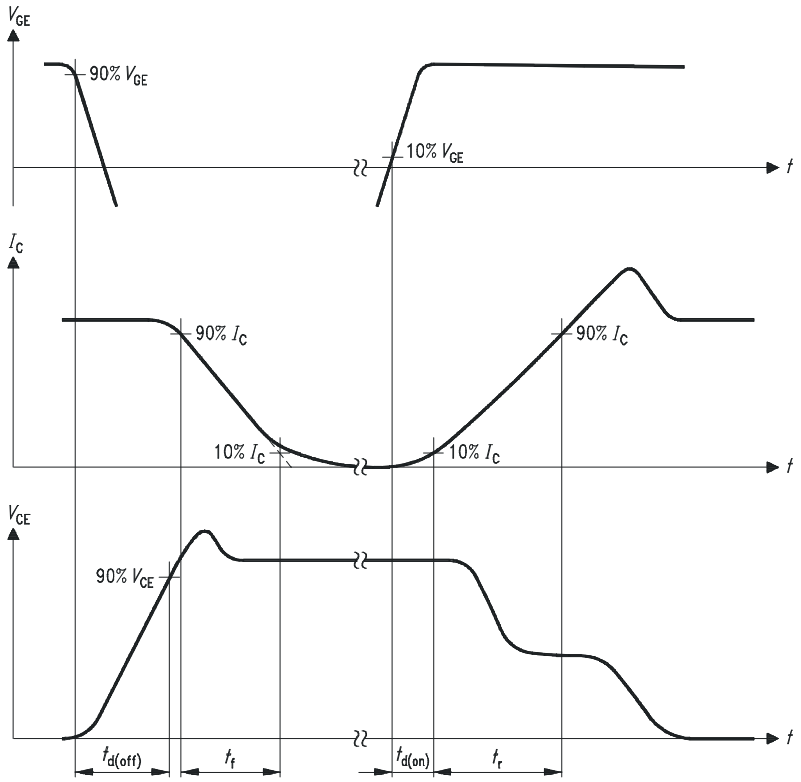

Figure A. Definition of switching times

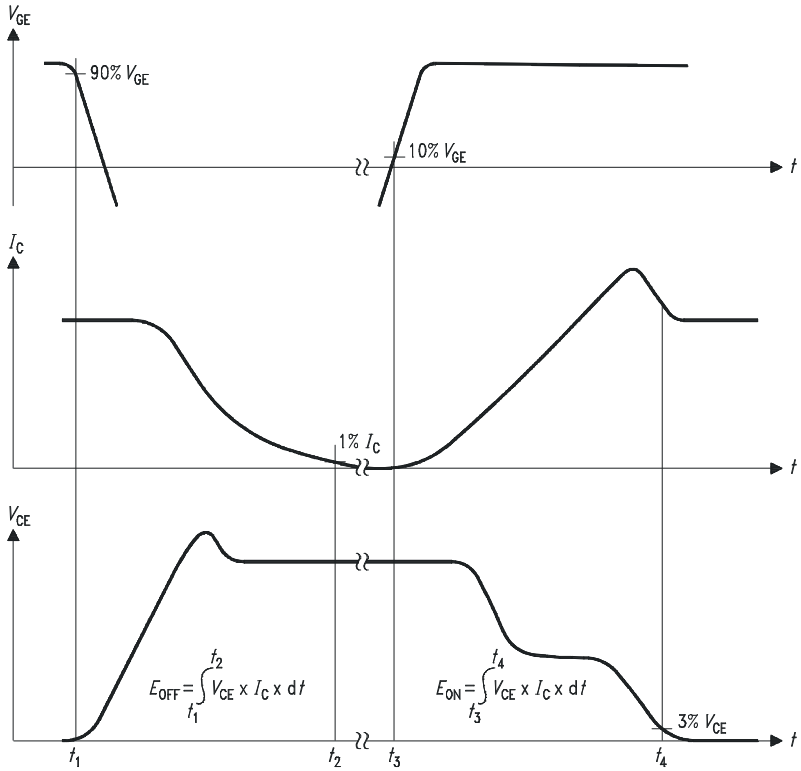

Figure B. Definition of switching losses

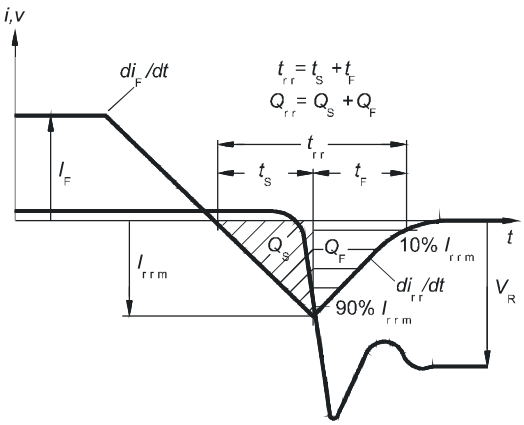

Figure C. Definition of diodes switching characteristics

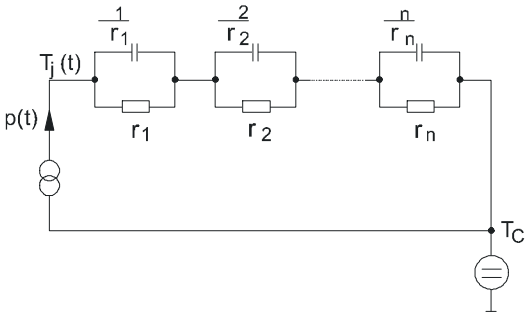

Figure D. Thermal equivalent circuit

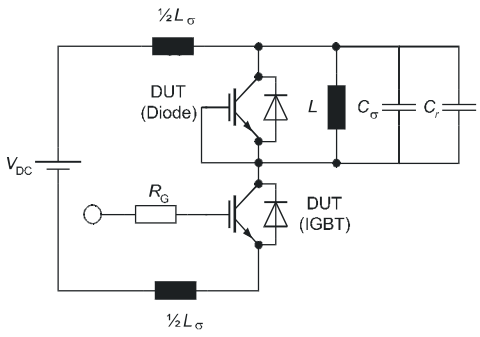

Figure E. Dynamic test circuit
Parasitic inductance L_σ,
Parasitic capacitor C_σ,
Relief capacitor C_r
(only for ZVT switching)

Revision History

IDV30E60C

Revision: 2010-07-26, Rev. 2.1

Previous Revision		
Revision	Date	Subjects (major changes since last revision)
2.1	-	Release of final datasheet

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