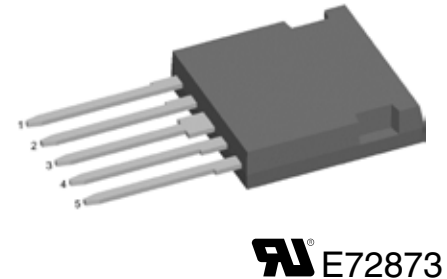
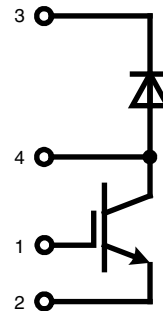


# IGBT Boost Chopper

in ISOPLUS i4-PAC™

 $I_{C25} = 65 \text{ A}$   
 $V_{CES} = 600 \text{ V}$   
 $V_{CE(sat) \text{ typ.}} = 1.6 \text{ V}$ 


E72873

IGBT			
Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	600	V
$V_{GES}$		$\pm 20$	V
$I_{C25}$	$T_C = 25^{\circ}\text{C}$	65	A
$I_{C90}$	$T_C = 90^{\circ}\text{C}$	40	A
$I_{CM}$	$V_{GE} = \pm 15 \text{ V}; R_G = 22 \Omega; T_{VJ} = 125^{\circ}\text{C}$	100	A
$V_{CEK}$	<b>RBSOA</b> Clamped inductive load; $L = 100 \mu\text{H}$	$V_{CES}$	
$t_{SC}$ <b>(SCSOA)</b>	$V_{CE} = V_{CES}; V_{GE} = \pm 15 \text{ V}; R_G = 22 \Omega$ $T_{VJ} = 125^{\circ}\text{C}; \text{non-repetitive}$	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^{\circ}\text{C}$	200	W

### Features

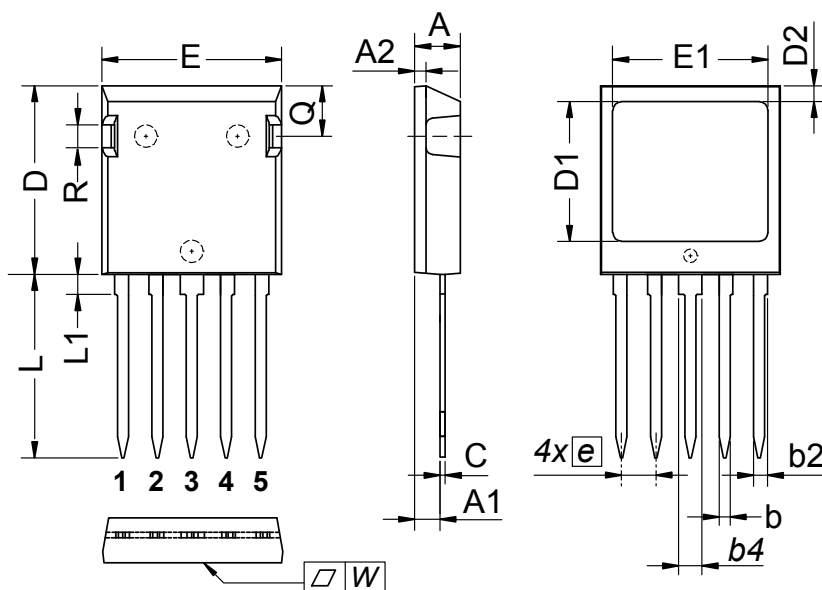
- NPT IGBT technology
  - low saturation voltage with positive temperature coefficient
  - fast switching
  - wide safe operating area
- HiPerFRED™ diode
  - fast reverse recovery
  - low operating forward voltage
  - low leakage current
- ISOPLUS i4-PAC™ package
  - isolated back surface
  - low coupling capacity between pins and heatsink
  - enlarged creepage towards heatsink
  - application friendly pinout
  - low inductive current path
  - high reliability
  - industry standard outline
  - UL registered E 72873

Symbol	Conditions	Characteristic Values				
		$(T_{VJ} = 25^{\circ}\text{C}, \text{ unless otherwise specified})$				
		min.	typ.	max.		
$V_{CE(sat)}$	$I_C = 30 \text{ A}; V_{GE} = 15 \text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$		1.6	2.0	V
		$T_{VJ} = 125^{\circ}\text{C}$		1.8		V
$V_{GE(th)}$	$I_C = 1 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5	V	
$I_{CES}$	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}$			0.1	mA	
				0.1	mA	
$I_{GES}$	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			200	nA	
$t_{d(on)}$	Inductive load $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 300 \text{ V}; I_C = 30 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 22 \Omega$		50		ns	
$t_r$			60		ns	
$t_{d(off)}$			300		ns	
$t_f$			30		ns	
$E_{on}$				1.0		mJ
$E_{off}$				1.4		mJ
$C_{ies}$	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$		2.8		nF	
$Q_{Gon}$	$V_{CE} = 300 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 50 \text{ A}$		120		nC	
$R_{thJC}$				0.6	K/W	
$R_{thJH}$	with heatsink compound		1.2		K/W	

### Applications

- medium frequency power supplies
  - boost chopper for power factor correction
  - transformer primary switch
- drives: supply of
  - switched reluctance machines
  - armature or excitation winding of DC machines
  - excitation winding of synchronous machines

Diode						
Symbol	Conditions		Maximum Ratings			
$V_{RRM}$	$T_{VJ} = 25^{\circ}\text{C}$ to $150^{\circ}\text{C}$		600	V		
$I_{F25}$	$T_C = 25^{\circ}\text{C}$		52	A		
$I_{F90}$	$T_C = 90^{\circ}\text{C}$		31	A		
Symbol	Conditions		Characteristic Values			
			min.	typ.	max.	
$V_F$	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$		2.2	2.6	V
		$T_{VJ} = 125^{\circ}\text{C}$		1.5		V
$I_R$	$V_R = V_{RRM}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.3	0.3	mA mA
$I_{RM}$ $t_{tr}$	} $I_F = 30\text{ A}; di_F/dt = -500\text{ A}/\mu\text{s};$ $V_R = 300\text{ V}; V_{GE} = 0\text{ V};$	$T_{VJ} = 125^{\circ}\text{C}$		15		A
				70		ns
$R_{thJC}$ $R_{thJH}$	with heatsink compound			2.6	1.3	K/W K/W
Component						
Symbol	Conditions		Maximum Ratings			
$T_{VJ}$	operating		-55...+150	$^{\circ}\text{C}$		
$T_{stg}$			-55...+125	$^{\circ}\text{C}$		
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}; t = 1\text{ s}$		2500	V~		
$F_C$	Mounting force with clip		20...120	Nm		
Symbol	Conditions		Characteristic Values			
			min.	typ.	max.	
$C_P$	coupling capacity between shorted pins and mounting tab in the case			40		pF
$d_{s, d_A}$ $d_{s, d_A}$	pin - pin pin - backside metal		1.7 5.5			mm mm
<b>Weight</b>				6		g



DIM.	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
C	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	3.81 BSC		0.15 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	—	0.10	—	0.004

Die konvexe Form des Substrates ist typ. < 0.05 mm über der Kunststoffoberfläche der Bauteilunterseite  
The convex bow of substrate is typ. < 0.05 mm over plastic surface level of device bottom side

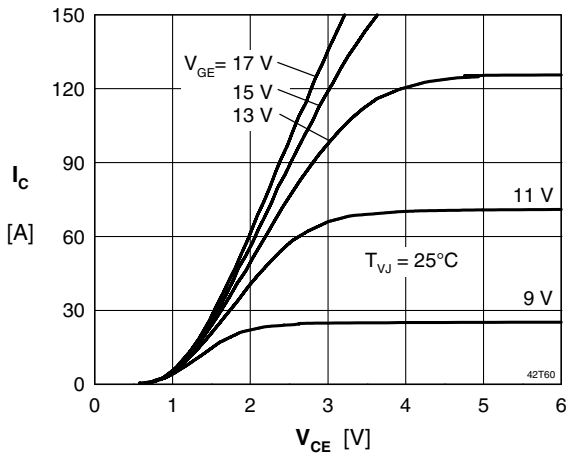


Fig. 1 Typ. output characteristics

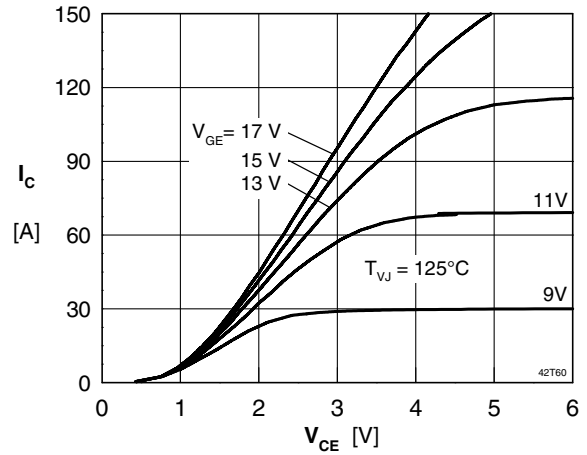


Fig. 2 Typ. output characteristics

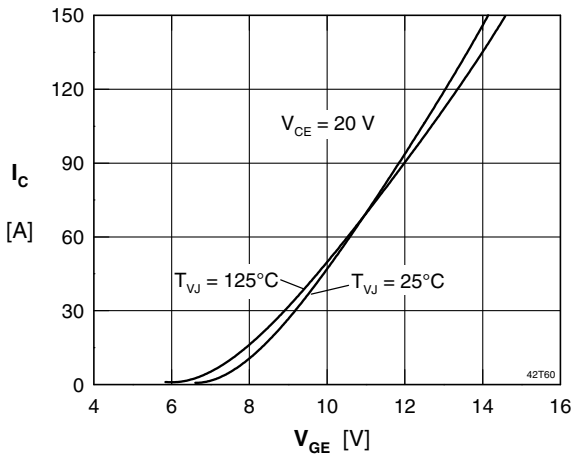


Fig. 3 Typ. transfer characteristics

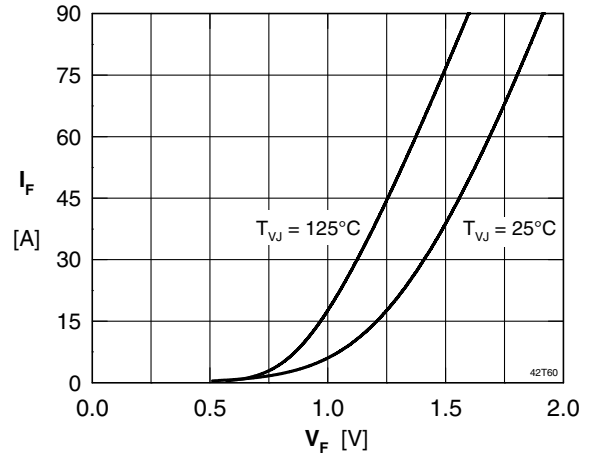


Fig. 4 Typ. forward characteristics of free wheeling diode

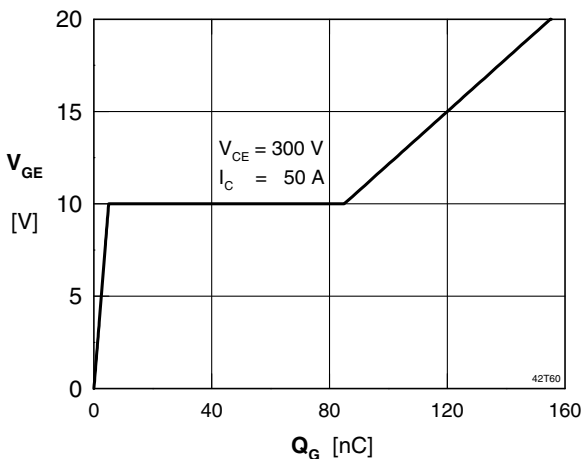


Fig. 5 Typ. turn on gate charge

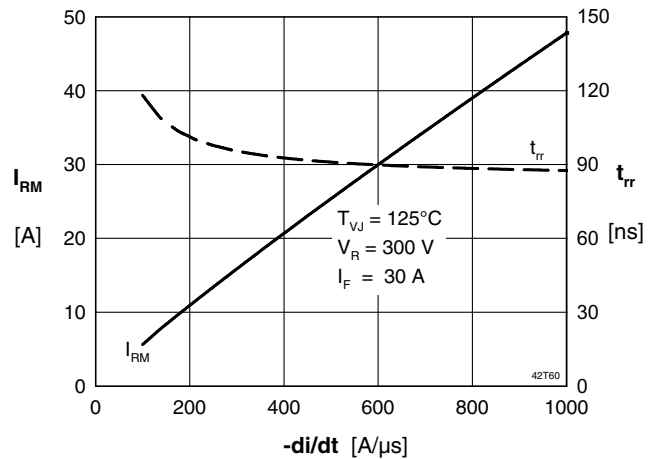


Fig. 6 Typ. turn off characteristics of free wheeling diode

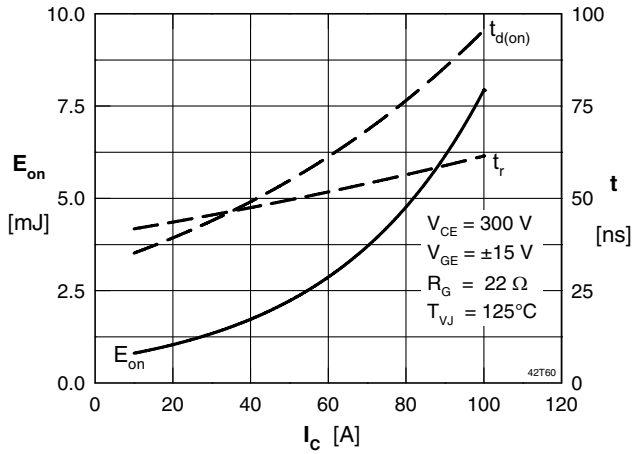


Fig. 7 Typ. turn on energy and switching

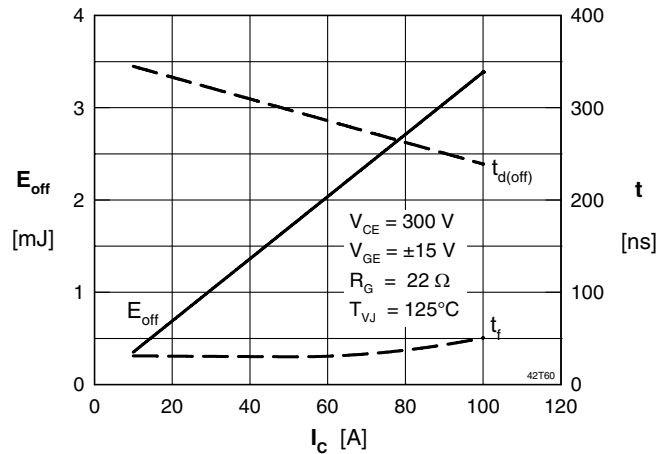


Fig. 8 Typ. turn off energy and switching times versus collector current times versus collector current

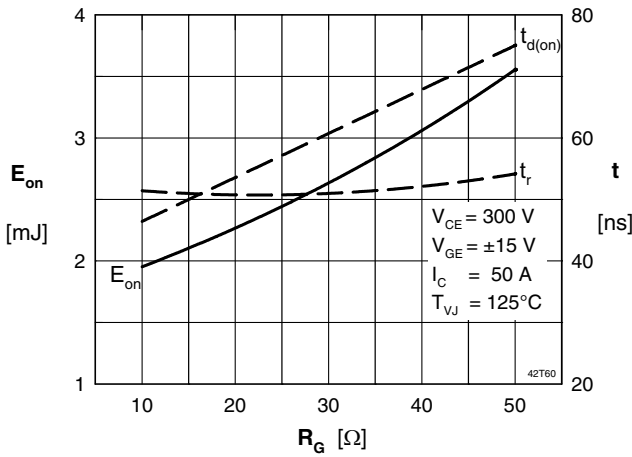


Fig. 9 Typ. turn on energy and switching

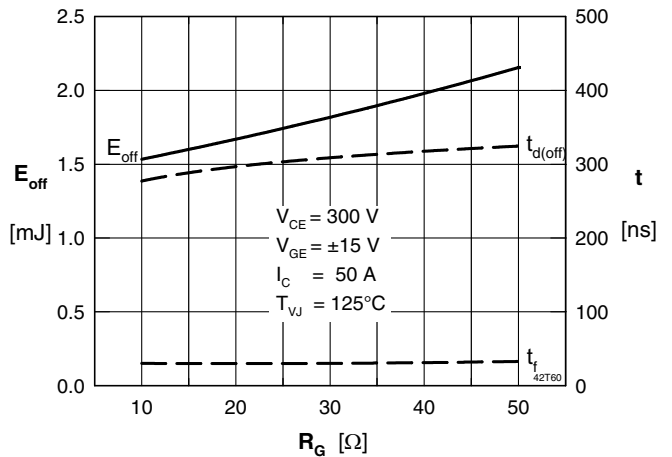


Fig. 10 Typ. turn off energy and switching times versus gate resistor times versus gate resistor

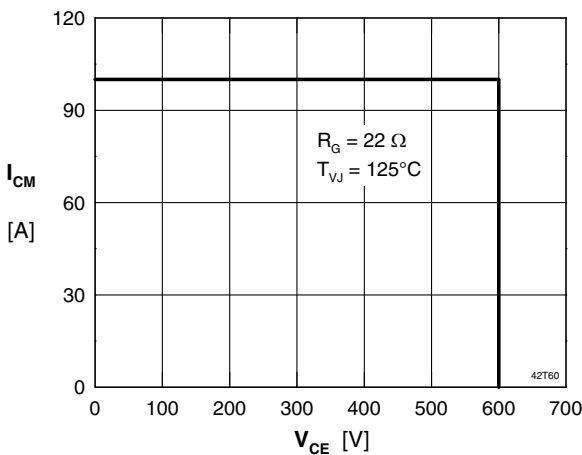


Fig. 11 Reverse biased safe operating area

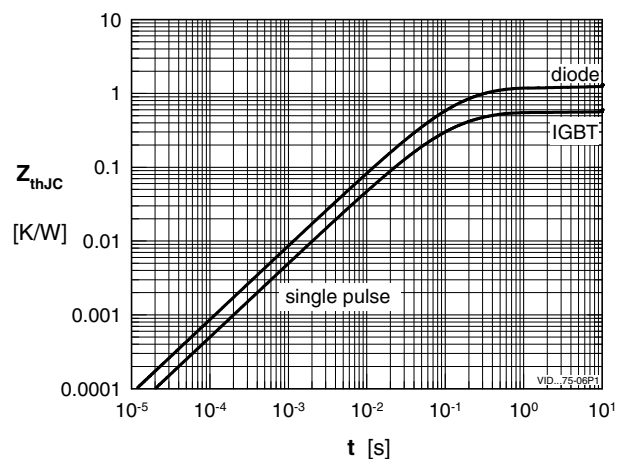


Fig. 12 Typ. transient thermal impedance RBSOA