

**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units	
<b>Boost IGBT</b>							
<b>Off Characteristics</b>							
$BV_{CES}$	Collector-Emitter Breakdown Voltage	$V_{GE} = 0\text{ V}, I_C = 1\text{ mA}$	650	-	-	V	
$I_{CES}$	Collector Cut-off Current	$V_{CE} = V_{CES}, V_{GE} = 0\text{ V}$	-	-	250	$\mu\text{A}$	
$I_{GES}$	Gate-Emitter Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0\text{ V}$	-	-	$\pm 2$	$\mu\text{A}$	
<b>On Characteristics</b>							
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$V_{GE} = V_{CE}, I_C = 40\text{ mA}$	3.9	5.1	6.8	V	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 40\text{ A}, V_{GE} = 15\text{ V}$	-	1.55	2.2	V	
		$I_C = 40\text{ A}, V_{GE} = 15\text{ V}, T_C = 125^\circ\text{C}$	-	1.85	-	V	
$R_{LEAD}$	Lead Resistance of Pin to Chip	per Chip	-	3.3	-	$\text{m}\Omega$	
<b>Switching Characteristics</b>							
$t_{d(on)}$	Turn-On Delay Time	$V_{CC} = 300\text{ V}$ $I_C = 40\text{ A}$ $V_{GE} = 15\text{ V}$ $R_G = 15\ \Omega$ Inductive Load $T_C = 25^\circ\text{C}$	-	24	-	ns	
$t_r$	Rise Time		-	24	-	ns	
$t_{d(off)}$	Turn-Off Delay Time		-	132	-	ns	
$t_f$	Fall Time		-	17	-	ns	
$E_{ON}$	Turn-On Switching Loss per Pulse		-	0.40	-	mJ	
$E_{OFF}$	Turn-Off Switching Loss per Pulse		-	0.28	-	mJ	
$t_{d(on)}$	Turn-On Delay Time		$V_{CC} = 300\text{ V}$ $I_C = 40\text{ A}$ $V_{GE} = 15\text{ V}$ $R_G = 15\ \Omega$ Inductive Load $T_C = 125^\circ\text{C}$	-	22	-	ns
$t_r$	Rise Time			-	27	-	ns
$t_{d(off)}$	Turn-Off Delay Time			-	148	-	ns
$t_f$	Fall Time			-	17	-	ns
$E_{ON}$	Turn-On Switching Loss per Pulse	-		0.59	-	mJ	
$E_{OFF}$	Turn-Off Switching Loss per Pulse	-		0.37	-	mJ	
$Q_g$	Total Gate Charge	$V_{CC} = 300\text{ V}, I_C = 40\text{ A}, V_{GE} = 15\text{ V}$		-	65	-	nC
$R_{\theta JC}$	Thermal Resistance of Junction to Case	per Chip		-	-	0.96	$^\circ\text{C}/\text{W}$
$R_{\theta CH}$	Thermal Resistance of Case to Heat sink	per Chip, $\lambda_{PCM} = 3.4\text{ W/mK}$		-	0.54	-	$^\circ\text{C}/\text{W}$
<b>Protection Diode</b>							
$V_F$	Diode Forward Voltage	$I_F = 15\text{ A}$	-	1.05	1.4	V	
		$I_F = 15\text{ A}, T_C = 125^\circ\text{C}$	-	0.95	-	V	
$R_{LEAD}$	Lead Resistance of Pin to Chip	per Chip	-	2.4	-	$\text{m}\Omega$	
$I_R$	Reverse Leakage Current	$V_R = 650\text{ V}$	-	-	250	$\mu\text{A}$	
$R_{\theta JC}$	Thermal Resistance of Junction to Case	per Chip	-	-	1.07	$^\circ\text{C}/\text{W}$	
$R_{\theta CH}$	Thermal Resistance of Case to Heat sink	per Chip, $\lambda_{PCM} = 3.4\text{ W/mK}$	-	0.33	-	$^\circ\text{C}/\text{W}$	
<b>Boost Diode</b>							
$V_F$	Diode Forward Voltage	$I_F = 15\text{ A}$	-	1.45	1.9	V	
		$I_F = 15\text{ A}, T_C = 125^\circ\text{C}$	-	1.75	-	V	
$R_{LEAD}$	Lead Resistance of Pin to Chip	per Chip	-	2.8	-	$\text{m}\Omega$	
$I_R$	Reverse Leakage Current	$V_R = 650\text{ V}$	-	-	60	$\mu\text{A}$	
$I_{rr}$	Reverse Recovery Current	$V_R = 300\text{ V}, I_F = 15\text{ A},$ $di/dt = 1390\text{ A}/\mu\text{s},$ $T_C = 25^\circ\text{C}$	-	9.2	-	A	
$Q_C$	Total Capacitive Charge	$V_R = 300\text{ V}, I_F = 15\text{ A},$ $di/dt = 1390\text{ A}/\mu\text{s},$ $T_C = 125^\circ\text{C}$	-	60	-	nC	
$E_{rec}$	Reverse Recovery Energy		-	4.9	-	$\mu\text{J}$	
$I_{rr}$	Reverse Recovery Current		-	9.2	-	A	
$Q_C$	Total Capacitive Charge	$V_R = 300\text{ V}, I_F = 15\text{ A},$ $di/dt = 1390\text{ A}/\mu\text{s},$ $T_C = 125^\circ\text{C}$	-	65	-	nC	
$E_{rec}$	Reverse Recovery Energy		-	4.9	-	$\mu\text{J}$	
$R_{\theta JC}$	Thermal Resistance of Junction to Case	per Chip	-	-	1.52	$^\circ\text{C}/\text{W}$	
$R_{\theta CH}$	Thermal Resistance of Case to Heat sink	per Chip, $\lambda_{PCM} = 3.4\text{ W/mK}$	-	0.18	-	$^\circ\text{C}/\text{W}$	

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Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
<b>NTC (Thermistor)</b>						
$R_{\text{NTC}}$	Rated Resistance	$T_C = 25^\circ\text{C}$	-	10	-	$\text{k}\Omega$
		$T_C = 100^\circ\text{C}$	-	936	-	$\Omega$
	Tolerance	$T_C = 25^\circ\text{C}$	-3	-	+3	%
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	-	-	20	mW
$B_{\text{Value}}$	B-Constant	$B_{25/50}$	-	3450	-	K
		$B_{25/100}$	-	3513	-	K