

**Key Parameters**

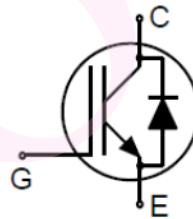
V_{CE}	= 1200V
I_C	= 40A ⁽¹⁾

Features

- Low $V_{ce(sat)}$
- High speed switching
- High ruggedness
-

Applications

- Inverter for motor drive
- Solar Inverters
- UPS
- Hard and Soft switching welding machine



Equivalent Circuit Schematic

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Absolute Maximum Ratings						
Symbol	Characteristic	Conditions	Value			Unit
V_{CES}	Collector-Emitter Voltage		1200			V
I_C	Continuous Collector Current	$T_C=25^{\circ}\text{C}, T_J=175^{\circ}\text{C}$	75			A
		$T_C=100^{\circ}\text{C}, T_J=175^{\circ}\text{C}$	48			A
I_{CRM}	Pulse Collector Current	Pulse width limited by maximum T_J	160			A
V_{GES}	Gate-Emitter Voltage		± 20			V
	Transient Gate-Emitter Voltage	$tp \leq 10\mu\text{s}, D < 0.010$	± 30			V
$P_{D(max)}$	Maximum power dissipation	$T_C=25^{\circ}\text{C}, T_J=175^{\circ}\text{C}$	333			W
Static Electrical Characteristics						
Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	Collector-Emitter breakdown Voltage	$V_{GE}=0\text{V}, I_C=250\mu\text{A}, T_{vj}=25^{\circ}\text{C}$	1200			V
$V_{GE(th)}$	Gate-emitter Threshold Voltage	$V_{GE}=V_{CE}, I_C=1\text{mA}, T_{vj}=25^{\circ}\text{C}$	4.2	5.2	6.2	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$			10.0	μA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_{vj}=150^{\circ}\text{C}$			5.0	mA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_{vj}=175^{\circ}\text{C}$			20.0	mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=40\text{A}, V_{GE}=15\text{V}, T_{vj}=25^{\circ}\text{C}$		1.7	2.05	V
		$I_C=40\text{A}, V_{GE}=15\text{V}, T_{vj}=150^{\circ}\text{C}$		2.35		V
		$I_C=40\text{A}, V_{GE}=15\text{V}, T_{vj}=175^{\circ}\text{C}$		2.5		V
I_{GES}	Gate-Emitter leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 20\text{V}, T_{vj}=25^{\circ}\text{C}$			100	ηA
V_F	Diode forward voltage	$I_C=40\text{A}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$		2.05	2.4	V
		$I_C=40\text{A}, V_{GE}=0\text{V}, T_{vj}=150^{\circ}\text{C}$		1.7		V
		$I_C=40\text{A}, V_{GE}=0\text{V}, T_{vj}=175^{\circ}\text{C}$		1.65		V
Thermal Characteristics						
Symbol	Characteristic	Conditions	Min.	Typ.	Max.	Unit
$R_{\theta jc}$	Junction-to Case	IGBT			0.45	$^{\circ}\text{C}/\text{W}$
		Diode			0.9	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Junction to Ambient				40	$^{\circ}\text{C}/\text{W}$
T_{jmax}	Maximum Junction Temperature				175	$^{\circ}\text{C}$
$T_{vj op}$	Operating Junction Temperature		-40		175	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-55		150	$^{\circ}\text{C}$
T_{slid}	Maximum lead temperature for soldering	1/8" from case for 5 seconds			260	$^{\circ}\text{C}$
(1) : $T_C=115^{\circ}\text{C}, T_J=175^{\circ}\text{C}$						
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Typical Electrical Characteristics

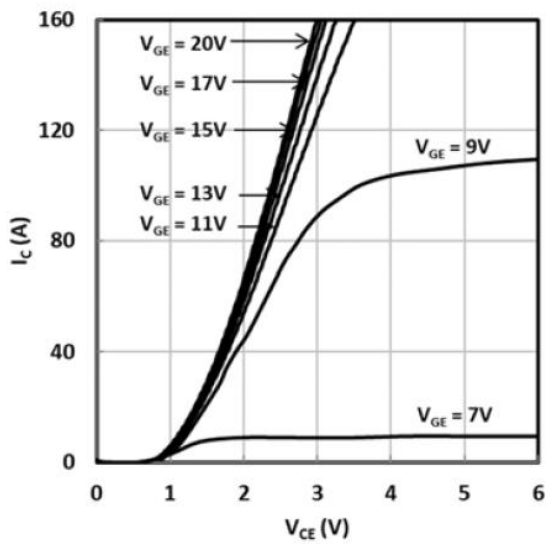


Fig. 1 Typical output characteristics
($T_J = 25\text{ }^\circ\text{C}$, $t_p = 250\text{ }\mu\text{s}$)

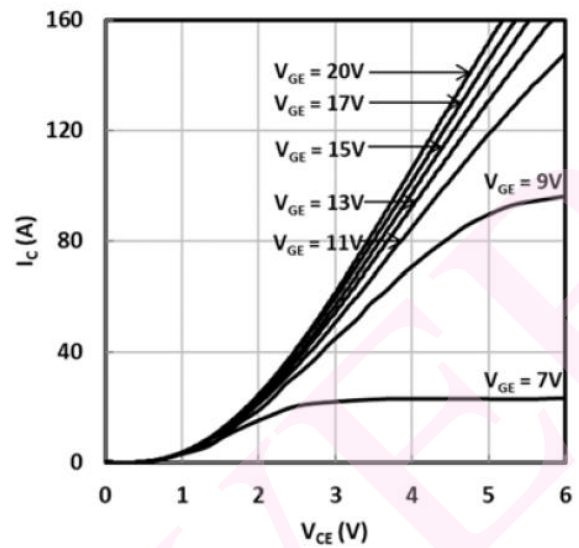


Fig. 2 Typical output characteristics
($T_J = 175\text{ }^\circ\text{C}$, $t_p = 250\text{ }\mu\text{s}$)

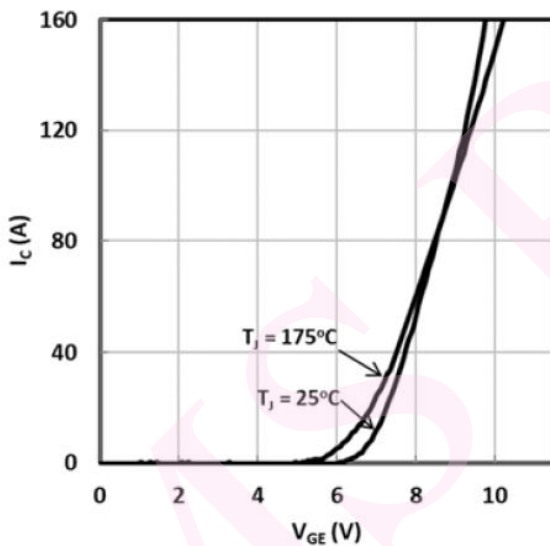


Fig. 3 Typical transfer characteristics
($V_{CE} = 20\text{ V}$, $t_p = 250\text{ }\mu\text{s}$)

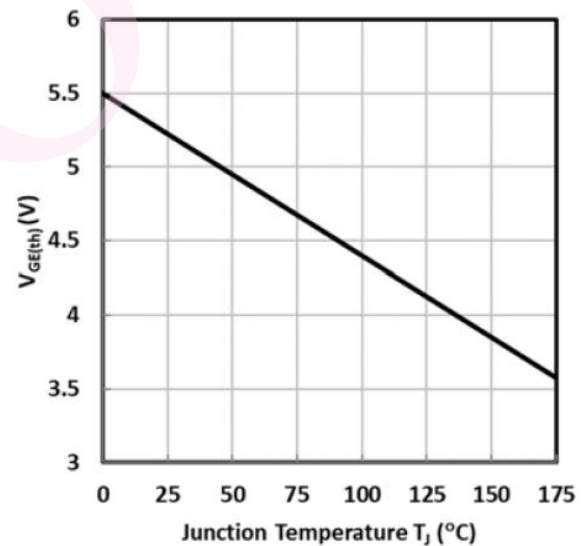


Fig. 4 Typical gate threshold voltage as a function of junction temperature
($V_{CE} = V_{GE}$, $I_C = 1\text{ mA}$)

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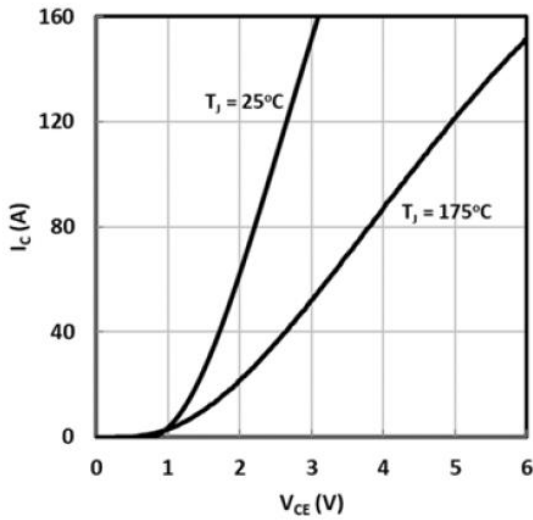


Fig. 5 Typical saturation voltage characteristics
($V_{GE} = 15\text{ V}$, $t_p = 250\ \mu\text{s}$)

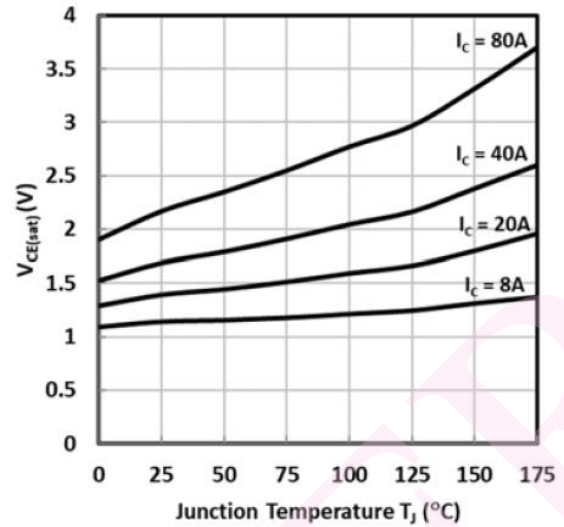


Fig. 6 Typical saturation voltage as a function of junction temperature
($V_{GE} = 15\text{ V}$, $t_p = 250\ \mu\text{s}$)

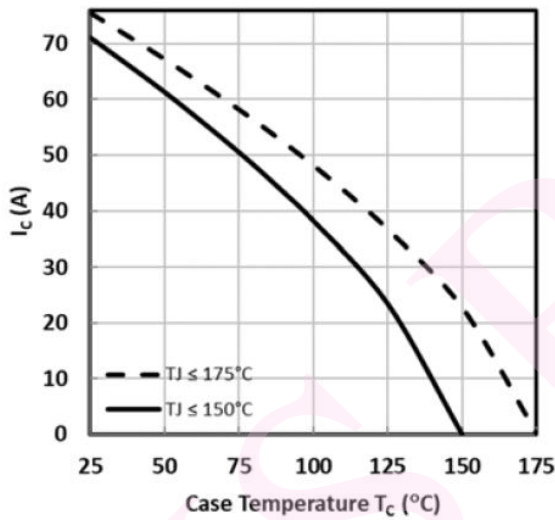


Fig. 7 Maximum DC collector current as a function of case temperature

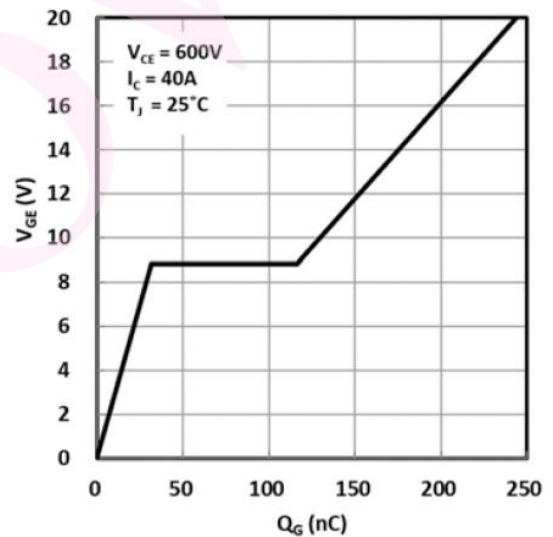


Fig. 8 Typical gate charge characteristics

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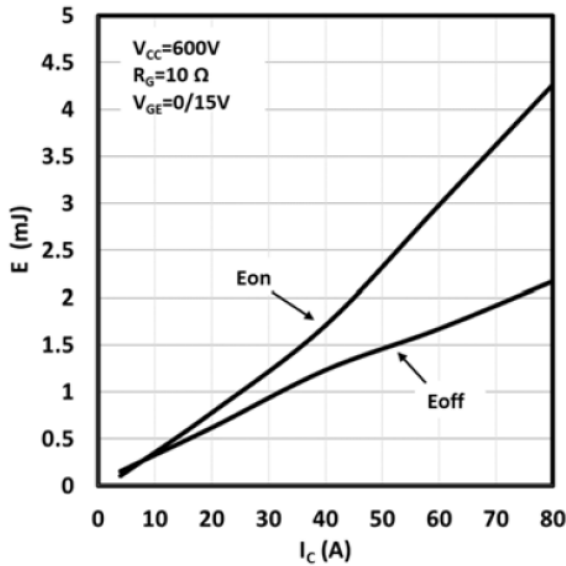


Fig. 9 Typical switching losses vs. I_c

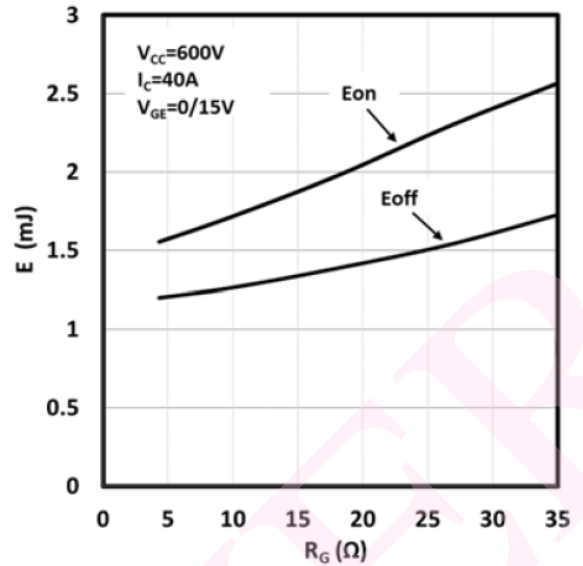


Fig. 10 Typical switching losses vs. R_G

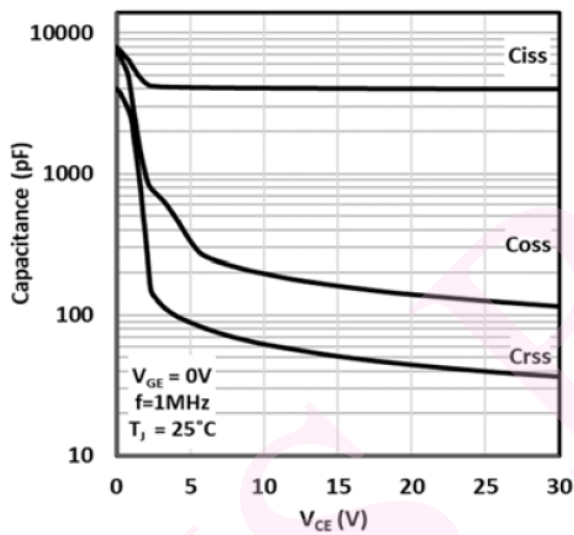


Fig. 11 Typical capacitance as a function of collector-to-emitter voltage

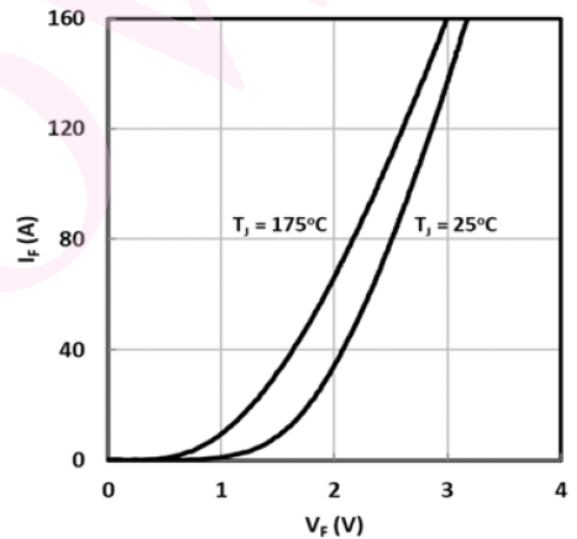


Fig. 12 Typical diode forward current as a function of forward voltage
($V_{GE} = 0 V$, $t_p = 250 \mu s$)

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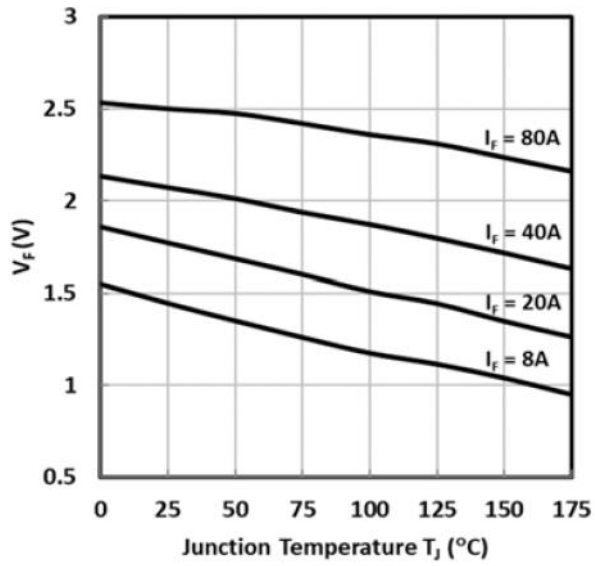
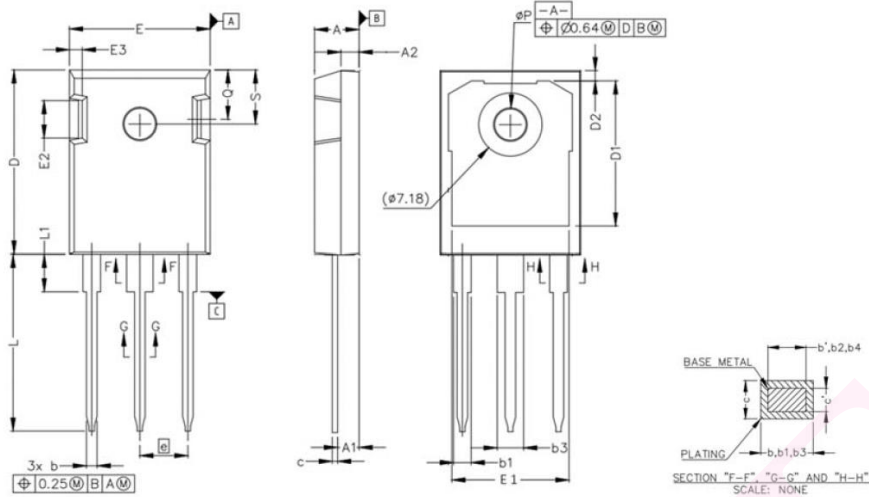


Fig. 13 Typical diode forward voltage as a function of junction temperature

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Outline :



SYM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.90	2.16	.075	.085
b'	1.07	1.28	.042	.050
b	1.07	1.33	.042	.052
b1	1.91	2.41	.075	.095
b2	1.91	2.16	.075	.085
b3	2.87	3.38	.113	.133
b4	2.87	3.13	.113	.123
c'	0.55	0.65	.022	.026
c	0.55	0.68	.022	.027
D	20.80	21.10	.819	.831
D1	16.25	17.65	.640	.695
D2	0.95	1.35	.037	.053
E	15.70	16.13	.618	.635
E1	12.38	13.50	.487	.531
E2	3.68	5.10	.145	.201
E3	1.00	1.90	.039	.075
e	5.44 BSC		.214 BSC	
L	19.80	20.32	.780	.800
L1	---	4.40	---	.173
OP	3.40	3.65	.134	.144
Q	5.49	6.00	.216	.236
S	6.04	6.30	.238	.248

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