Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

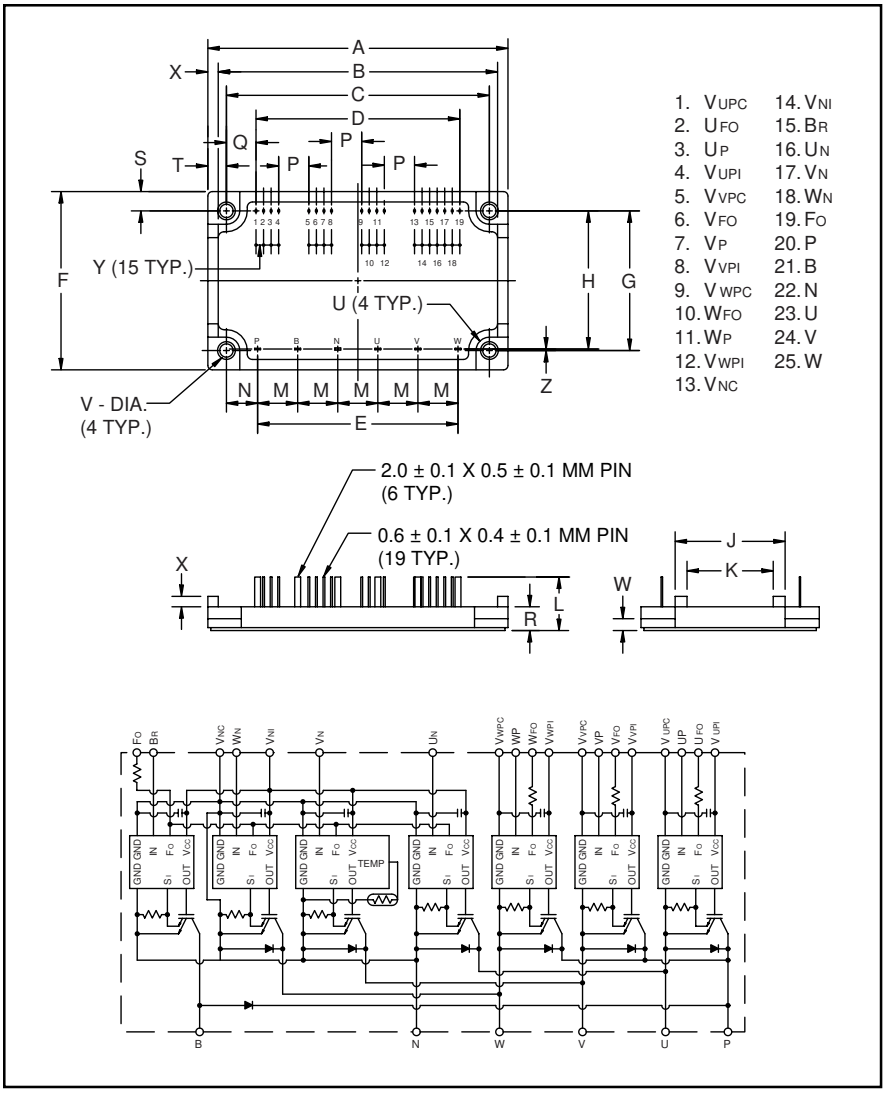
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

Intellimod™ Module

Three Phase + Brake
IGBT Inverter Output
15 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	3.98±0.04	101.0±1.0
B	3.70	94.0
C	3.48±0.03	88.5±0.8
D	2.700±0.03	68.58±0.8
E	2.66±0.02	67.5±0.5
F	2.36±0.04	60.0±1.0
G	1.85±0.02	47.0±0.5
H	1.83±0.03	46.5±0.8
J	1.46	37.0
K	1.14	29.0
L	0.71±0.04	18.0±1.0
M	0.53±0.01	13.5±0.3

Dimensions	Inches	Millimeters
N	0.41	10.5
P	0.400	10.16
Q	0.392	9.96
R	0.31	8.0
S	0.26	6.5
T	0.246	6.25
U	0.18 Rad.	Rad. 4.5
V	0.18 Dia.	Dia. 4.5
W	0.16±0.02	4.0±0.5
X	0.14	3.5
Y	0.100±0.01	2.54±0.25
Z	0.02	0.5

Description:
Powerex Intellimod™ Intelligent Power Modules are isolated base modules designed for power switching applications operating at frequencies to 20kHz. Built-in control circuits provide optimum gate drive and protection for the IGBT and free-wheel diode power devices.

Features:
- ☐ Complete Output Power Circuit
- ☐ Gate Drive Circuit
- ☐ Protection Logic
  - – Short Circuit
  - – Over Current
  - – Over Temperature
  - – Under Voltage

Applications:
- ☐ Inverters
- ☐ UPS
- ☐ Motion/Servo Control
- ☐ Power Supplies

Ordering Information:
Example: Select the complete part number from the table below -i.e. PM15RSH120 is a 1200V, 15 Ampere Intellimod™ Intelligent Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 10)
PM	15	120

Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

PM15RSH120
Intellimod™ Module
Three Phase + Brake IGBT Inverter Output
15 Amperes/1200 Volts

Absolute Maximum Ratings, T_j = 25°C unless otherwise specified

Characteristics	Symbol	PM15RSH120	Units
Power Device Junction Temperature	T_j	-20 to 150	°C
Storage Temperature	T_{stg}	-40 to 125	°C
Case Operating Temperature	T_C	-20 to 100	°C
Mounting Torque, M4 Mounting Screws	—	13	in-lb
Module Weight (Typical)	—	100	Grams
Supply Voltage Protected by OC and SC (V_D = 13.5 - 16.5V, Inverter Part, T_j = 125°C)	$V_{CC(prot.)}$	800	Volts
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	V_{RMS}	2500	Volts

Control Sector

Supply Voltage Applied between (V_{UP1}-V_{UPC}, V_{VP1}-V_{VPC}, V_{WP1}-V_{WPC}, V_{N1}-V_{NC})	V_D	20	Volts
Input Voltage Applied between (U_P, V_P, W_P, U_N, V_N, W_N, B_r)	V_{CIN}	20	Volts
Fault Output Supply Voltage	V_{FO}	20	Volts
Fault Output Current	I_{FO}	20	mA

IGBT Inverter Sector

Collector-Emitter Voltage (V_D = 15V, V_{CIN} = 15V)	V_{CES}	1200	Volts
Collector Current, ±	I_C	15	Amperes
Peak Collector Current, ±	I_{CP}	30	Amperes
Supply Voltage (Applied between P - N)	V_{CC}	900	Volts
Supply Voltage, Surge (Applied between P - N)	$V_{CC(surge)}$	1000	Volts
Collector Dissipation	P_C	83	Watts

Brake Sector

Collector-Emitter Voltage	V_{CES}	1200	Volts
Collector Current, ±	I_C	10	Amperes
Peak Collector Current, ±	I_{CP}	20	Amperes
Supply Voltage (Applied between P - N)	V_{CC}	900	Volts
Supply Voltage, Surge (Applied between P - N)	$V_{CC(surge)}$	1000	Volts
Collector Dissipation	P_C	41	Watts
Diode Forward Current	I_F	10	Amperes
Diode DC Reverse Voltage	$V_{R(DC)}$	1200	Volts

Electrical and Mechanical Characteristics, T_j = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Control Sector						
Over Current Trip Level Inverter Part	OC	-20°C ≤ T ≤ 125°C	22	37	—	Amperes
Over Current Trip Level Brake Part			15	27	—	Amperes
Short Circuit Trip Level Inverter Part	SC	-20°C ≤ T ≤ 125°C	—	56	—	Amperes
Short Circuit Trip Level Brake Part			—	41	—	Amperes
Over Current Delay Time	$t_{off(OC)}$	V_D = 15V	—	10	—	µS
Over Temperature Protection	OT	Trip Level	100	110	120	°C
	OT_R	Reset Level	—	90	—	°C
Supply Circuit Under Voltage Protection	UV	Trip Level	11.5	12.0	12.5	Volts
	UV_R	Reset Level	—	12.5	—	Volts
Supply Voltage	V_D	Applied between V_{UP1}-V_{UPC}, V_{VP1}-V_{VPC}, V_{WP1}-V_{WPC}, V_{N1}-V_{NC}	13.5	15	16.5	Volts
Circuit Current	I_D	V_D = 15V, V_{CIN} = 15V, V_{N1}-V_{NC}	—	25	35	mA
		V_D = 15V, V_{CIN} = 15V, V_{XP1}-V_{XPC}	—	7	10	mA
Input ON Threshold Voltage	$V_{CIN(on)}$	Applied between	1.2	1.5	1.8	Volts
Input OFF Threshold Voltage	$V_{CIN(off)}$	U_P, V_P, W_P, U_N, V_N, W_N, B_r	1.7	2.0	2.3	Volts
PWM Input Frequency	f_{PWM}	3-∅ Sinusoidal	—	15	20	kHz
Fault Output Current	$I_{FO(H)}$	V_D = 15V, V_{FO} = 15V	—	—	0.01	mA
	$I_{FO(L)}$	V_D = 15V, V_{FO} = 15V	—	10	15	mA
Minimum Fault Output Pulse Width	t_{FO}	V_D = 15V	1.0	1.8	—	mS

Electrical and Mechanical Characteristics, T_j = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
IGBT Inverter Sector						
Collector Cutoff Current	I_{CES}	$V_{CE} = V_{CES}$, T_j = 25°C	—	—	1.0	mA
		$V_{CE} = V_{CES}$, T_j = 125°C	—	—	10	mA
Diode Forward Voltage	V_{FM}	$-I_C$ = 15A, V_D = 15V, V_{CIN} = 5V	—	2.5	3.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_D = 15V, V_{CIN} = 0V, I_C = 15A	—	2.3	3.3	Volts
		V_D = 15V, V_{CIN} = 0V, I_C = 15A, T_j = 125°C	—	2.1	3.1	Volts
Inductive Load Switching Times	t_{on}	V_D = 15V, V_{CIN} = 0 ~ 15V, V_{CC} = 600V, I_C = 15A, T_j = 125°C	0.4	0.7	1.5	µS
	t_{rr}		—	0.15	0.3	µS
	$t_{C(on)}$		—	0.3	1.0	µS
	t_{off}		—	1.7	2.9	µS
	$t_{C(off)}$		—	0.7	1.3	µS
Brake Sector						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_D = 15V, V_{CIN} = 0V, I_C = 15A, T_j = 25°C	—	2.8	3.8	Volts
		V_D = 15V, V_{CIN} = 0V, I_C = 15A, T_j = 125°C	—	2.5	3.5	Volts
Diode Forward Voltage	V_{FM}	$-I_C$ = 10A, V_D = 15V, V_{CIN} = 5V	—	2.5	3.5	Volts
Collector Cutoff Current	I_{CES}	$V_{CE} = V_{CES}$, T_j = 25°C	—	—	1	mA
		$V_{CE} = V_{CES}$, T_j = 125°C	—	—	10	mA

Thermal Characteristics

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance	$R_{th(j-c)Q}$	Each Inverter IGBT	—	—	1.5	°C/Watt
	$R_{th(j-c)D}$	Each Inverter FWDi	—	—	4.5	°C/Watt
	$R_{th(c-f)Q}$	Each Brake IGBT	—	—	3.0	°C/Watt
	$R_{th(c-f)D}$	Each Brake FWDi	—	—	5.5	°C/Watt
Contact Thermal Resistance	$R_{th(c-f)}$	Case to Fin Per Module, Thermal Grease Applied	—	—	0.044	°C/Watt

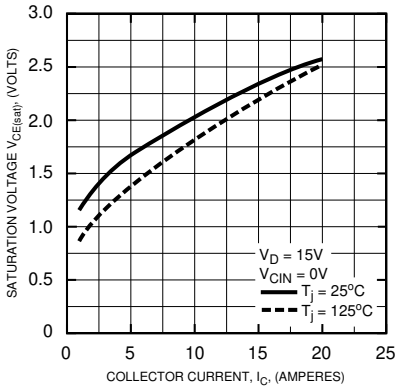
Recommended Conditions for Use

Characteristic	Symbol	Condition	Value	Units
Supply Voltage	V_{CC}	Applied across P-N Terminals	0 ~ 800	Volts
	V_D	Applied between V_{UP1}-V_{UPC}, V_{N1}-V_{NC}, V_{VP1}-V_{VPC}, V_{WP1}-V_{WPC}	15 ± 1.5	Volts
Input ON Voltage	$V_{CIN(on)}$	Applied between U_P, V_P, W_P, U_N, V_N, W_N, B_r	0 ~ 0.8	Volts
Input OFF Voltage	$V_{CIN(off)}$		4.0 ~ V_D	Volts
PWM Input Frequency	f_{PWM}	Using Application Circuit	5 ~ 20	kHz
Minimum Dead Time	t_{DEAD}	Input Signal	≥ 2.5	µS

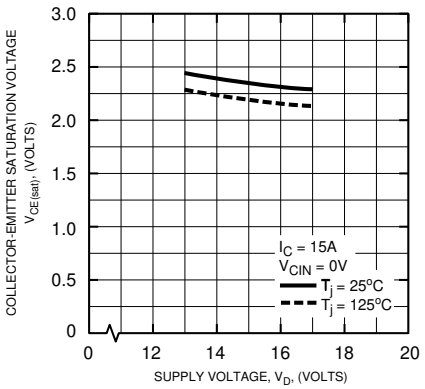
PM15RSH120
Intellimod™ Module
Three Phase + Brake IGBT Inverter Output
15 Amperes/1200 Volts

Inverter Part

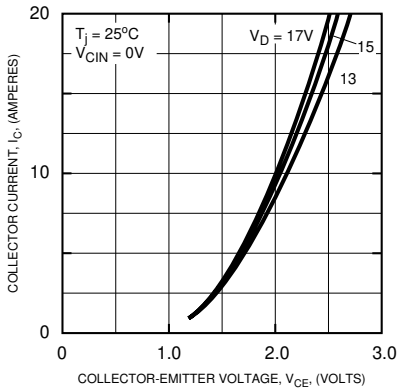
SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



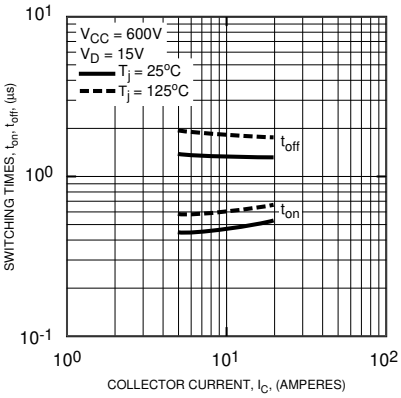
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



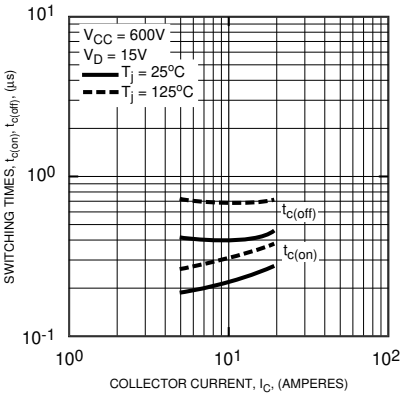
OUTPUT CHARACTERISTICS (TYPICAL)



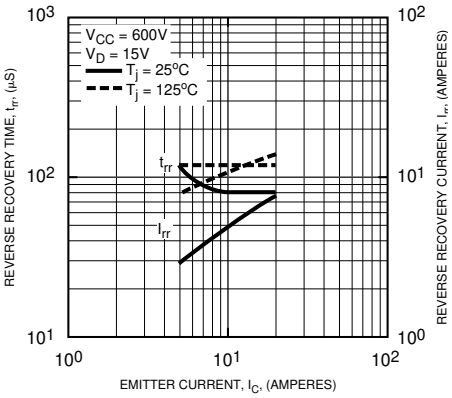
SWITCHING TIME VS. COLLECTOR CURRENT (TYPICAL)



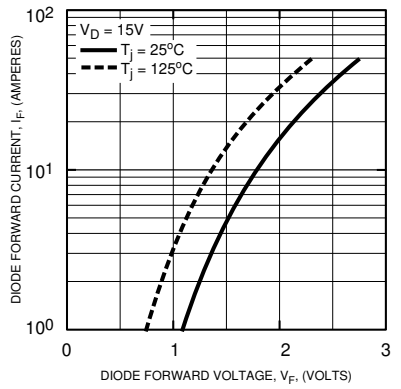
SWITCHING TIME VS. COLLECTOR CURRENT (TYPICAL)



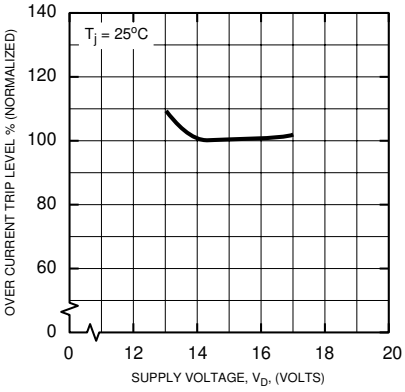
REVERSE RECOVERY CURRENT VS. COLLECTOR CURRENT (TYPICAL)



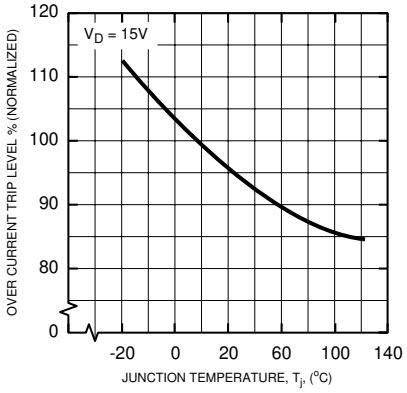
DIODE FORWARD CHARACTERISTICS



OVER CURRENT TRIP LEVEL VS. SUPPLY VOLTAGE (TYPICAL)



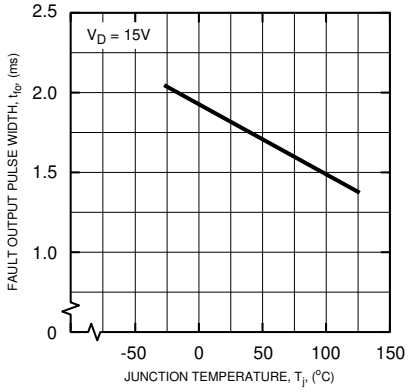
OVER CURRENT TRIP LEVEL VS. TEMPERATURE (TYPICAL)



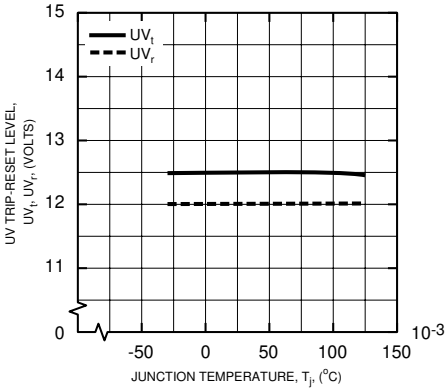
PM15RSH120
Intellimod™ Module
Three Phase + Brake IGBT Inverter Output
15 Amperes/1200 Volts

Inverter Part

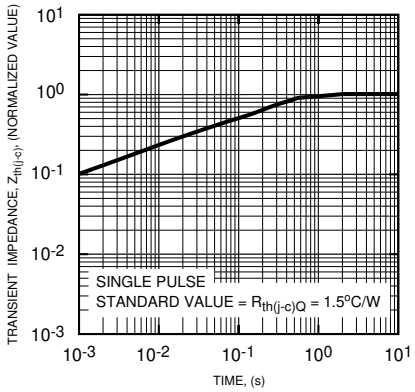
FAULT OUTPUT PULSE WIDTH VS. TEMPERATURE (TYPICAL)



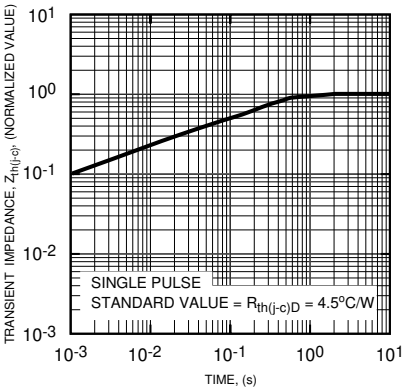
CONTROL SUPPLY VOLTAGE TRIP-RESET LEVEL TEMPERATURE DEPENDENCY (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT)



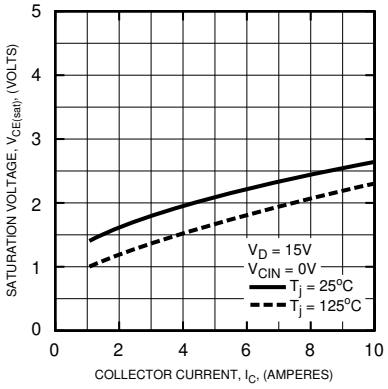
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (FWDi)



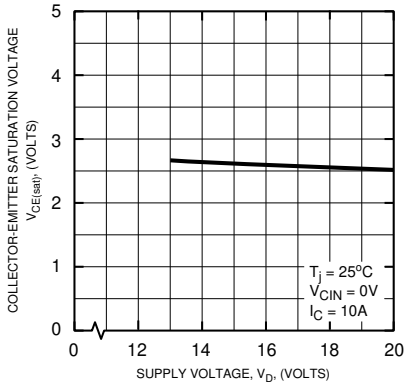
PM15RSH120
Intellimod™ Module
Three Phase + Brake IGBT Inverter Output
15 Amperes/1200 Volts

Brake Part

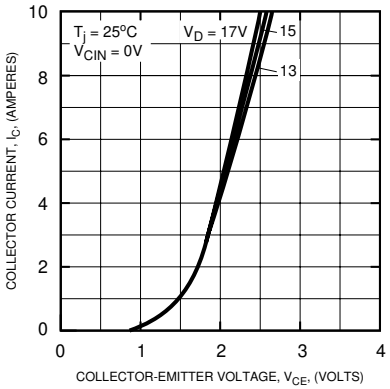
SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



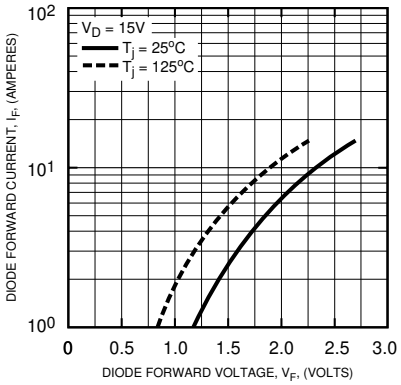
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



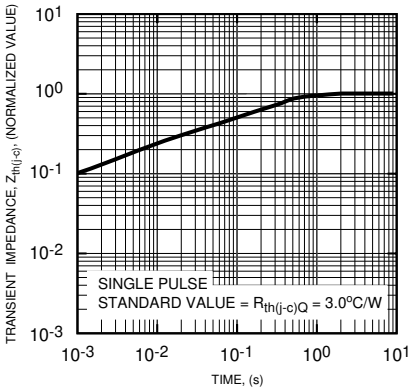
OUTPUT CHARACTERISTICS (TYPICAL)



DIODE FORWARD CHARACTERISTICS



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (FWDi)