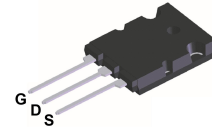


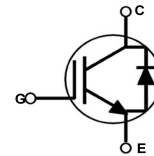
Features

- High Speed Switching & Low Power Loss
- High Input Impedance
- $V_{CE(sat)} = 2V$ @ $I_C = 50A$
- High Input Impedance



Applications

- PFC
- UPS
- Inverter



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	± 20	
Collector current	$T_C = 25^\circ C$	I_C	100	A
	$T_C = 100^\circ C$		50	
Pulsed collector current, pulse time limited by T_{jmax}		I_{CM}	160	
Diode forward current @ $T_C = 100^\circ C$		I_F	30	
Diode pulsed current, Pulse time limited by T_{jmax}		I_{FM}	210	
Power dissipati	$T_C = 25^\circ C$	P_D	360	W
	$T_C = 100^\circ C$		150	
Short circuit withstand time $V_{CE} = 600V$, $V_{GE} = 15V$, $T_C = 150^\circ C$ Allowed number of short circuit < 1000 Time between short circuits $\geq 1.0s$		tsc	10	μS
Operating Junction and storage temperature rang		T_J	-55 to 155	$^\circ C$
		T_{stg}	-55 to 155	

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance junction-to-ambien	$R_{\theta JA}$	40	$^\circ C/W$
Thermal resistance junction-to-case for IGBT	$R_{\theta JC}$	0.35	
Thermal resistance junction-to-case for Diod	$R_{\theta JC}$	0.8	

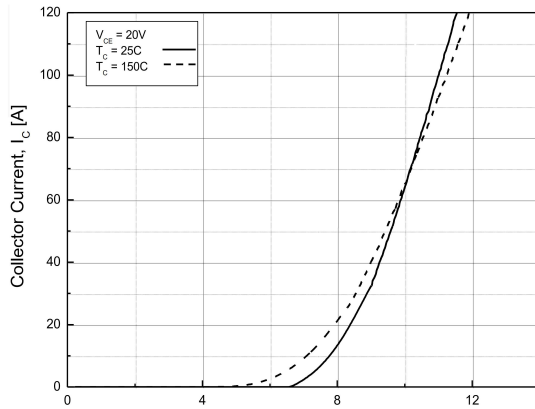
Electrical Characteristics (T_C = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Collector-emitter breakdown voltag	BV _{CES}	I _C = 1mA, V _{GE} = 0V	1200			V
Gate-emitter threshold voltage	V _{GE(th)}	V _{CE} = V _{GE} , I _C = 1mA	4.5	5.5	6.5	
Zero gate voltage collector current	I _{CES}	V _{CE} = 1200V, V _{GE} = 0V	-		1	mV
Gate-emitter leakage current	I _{GES}	V _{GE} = 20V, V _{CE} = 0V	-		±250	nA
Collector-emitter saturation voltage	V _{CE(sat)}	I _C = 40A V _{GE} = 15V T _C = 25°C	-		2.4	V
		I _C = 40A, V _{GE} = 15V, T _C = 150°C	-	2.45		
Dynamic and Switching Characteristi						
Total gate charg	Q _g	V _{CE} = 600V, I _C = 40A, V _{GE} = 15V	-	341	-	nC
Gate-emitter charg	Q _{ge}		-	52	-	
Gate-collector charg	Q _{gc}		-	126	-	
Input capacitanc	C _{ies}	V _{CE} = 30V, V _{GE} = 0V, f = 1MHz	-	6000	-	pF
Reverse transfer capacitanc	C _{res}		-	107	-	
Output capacitance	C _{oes}		-	206	-	
Turn-on delay time	t _{d(on)}	V _{GE} = 15V, V _{CC} = 600V, I _C = 40A, R _G = 10Ω	-	65	-	nS
Rise tim	t _r		-	55	-	
Turn-off delay time	t _{d(off)}		-	308	-	
Fall time	t _f		-	40	-	
Turn-on switching energy	E _{on}	Inductive Load, T _C = 25°C	-	1.96	-	mJ
Turn-off switching energy	E _{off}		-	0.54	-	
Total switching energ	E _{ts}		-	2.5	-	
Turn-on delay time	t _{d(on)}	V _{GE} = 15V, V _{CC} = 600V, I _C = 40A, R _G = 10Ω	-	70	-	nS
Rise tim	t _r		-	61.5	-	
Turn-off delay time	t _{d(off)}		-	325	-	
Fall time	t _f		-	155	-	
Turn-on switching energy	E _{on}	Inductive Load, T _C = 150°C	-	2.5	-	mJ
Turn-off switching energ	E _{off}		-	1.61	-	
Total switching energ	E _{ts}		-	4.11	-	
Diode Characteristics (T _c =25oC unless otherwise specified)						
Forward voltag	V _F	I _F =30A,T _C =25°C	-	3.0	3.5	V
		I _F =30A,T _C =125°C	-	2.2	2.7	
Reverse recovery time	t _{rr}	I _F =30A,di/dt=200A/μS	-	40	70	nS
Reverse recovery current	I _{rr}	T _C =25°C	-	6.5	-	A

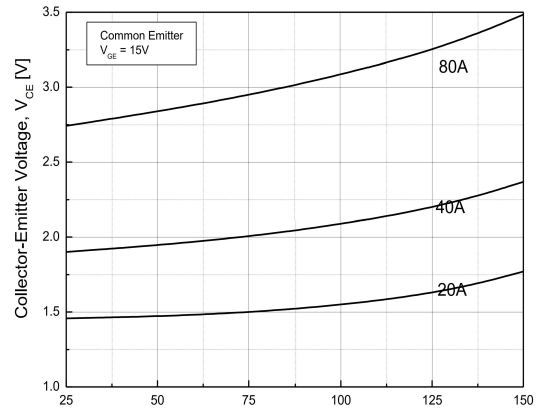
Reverse recovery charge	Q_{rr}	$I_F=30A, di/dt=200A/\mu S$ $T_C=125^\circ C$	-	285	-	nC
Reverse recovery time	t_{rr}		-	130	-	nS
Reverse recovery current	I_{rr}		-	11.3	-	A
Reverse recovery charge	Q_{rr}		-	2.10	-	nC

Typical Performance Characteristic

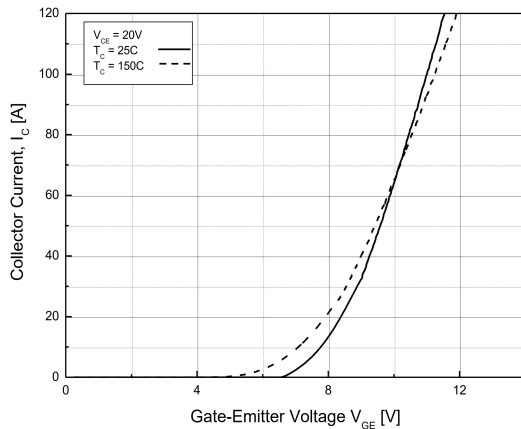
Typical Output Characteristics



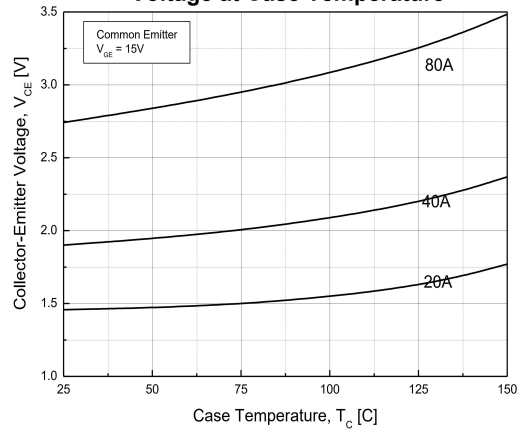
Typical Collector-Emitter Saturation Voltage



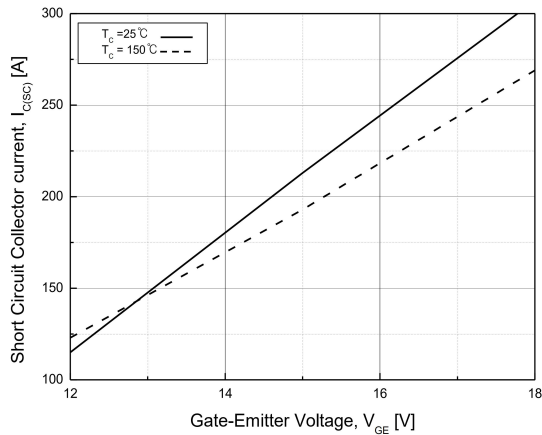
Typical Transfer Characteristics



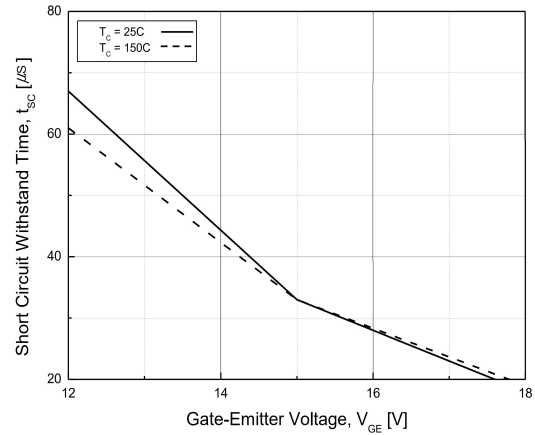
Typical Collector-Emitter Saturation Voltage at Case Temperature



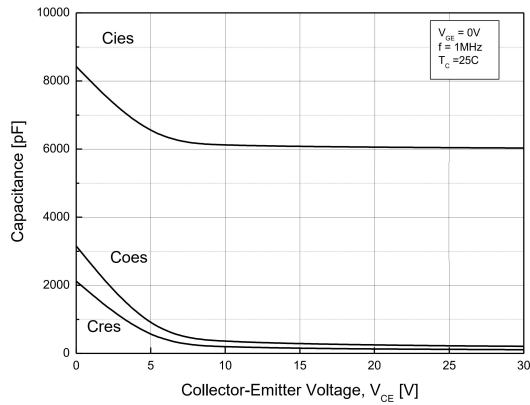
Typical Short Circuit Collector Current



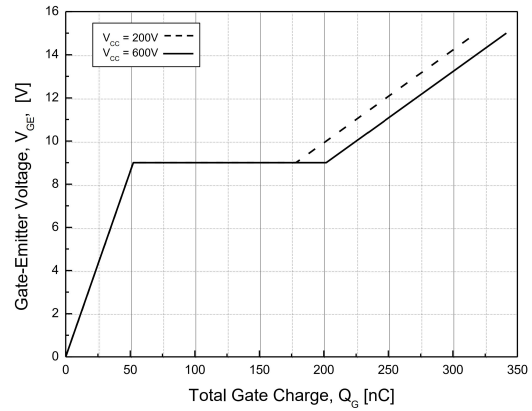
Typical Short Circuit Withstand Time



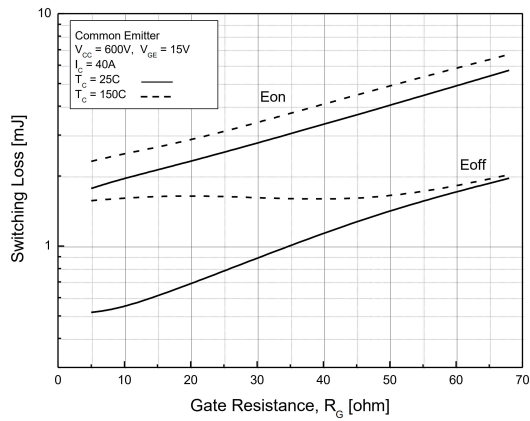
Typical Capacitance



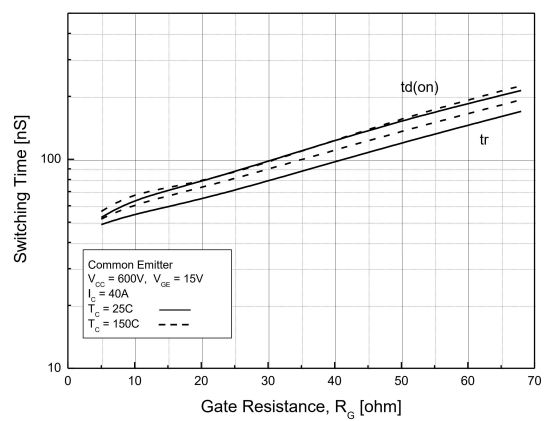
Typical Gate Charge



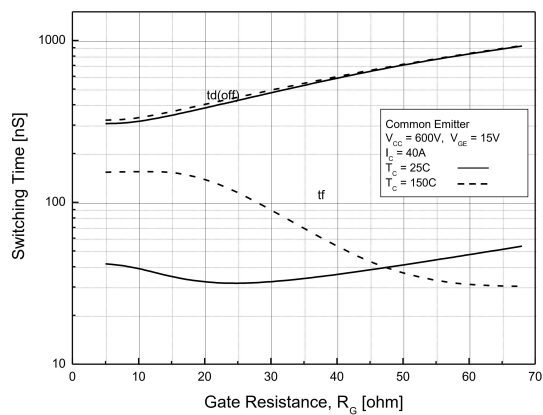
Switching Loss-Gate Resistance



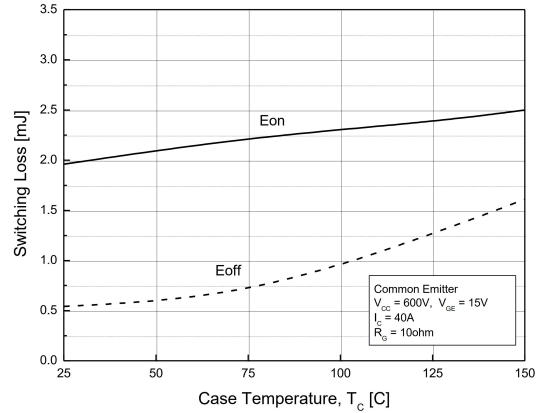
Turn on Characteristics-Gate Resistance



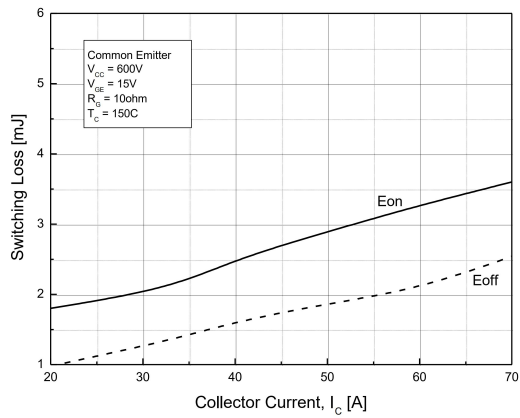
Turn off Characteristics-Gate Resistance



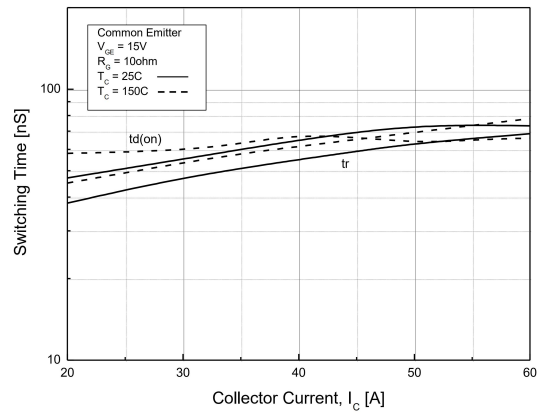
Switching Loss-Case Temperature



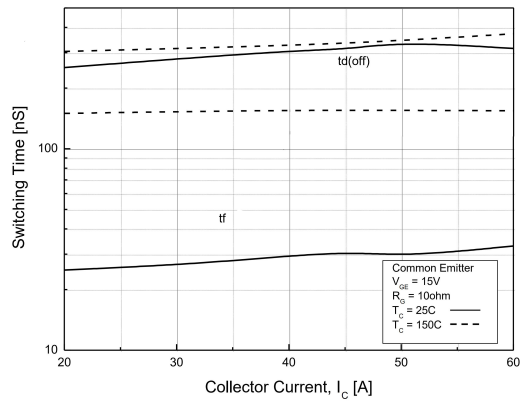
Switching Loss-Collector Current



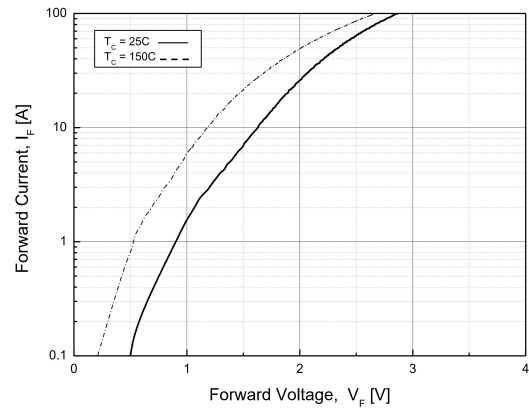
Typical Turn on-Collector Current



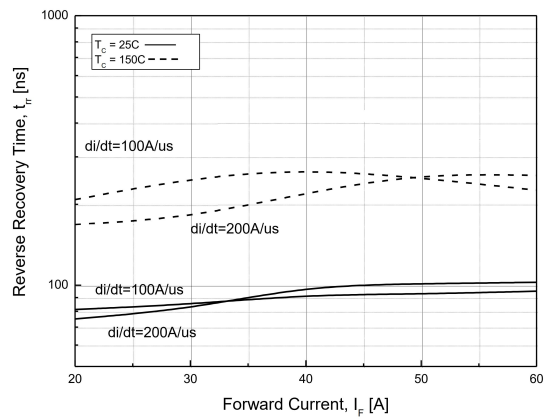
Typical Turn off-Collector Current



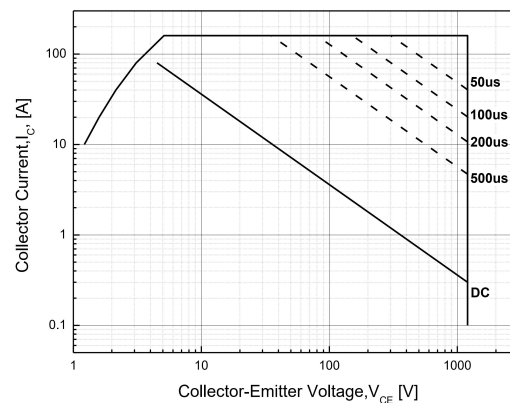
Diode Forward Characteristics



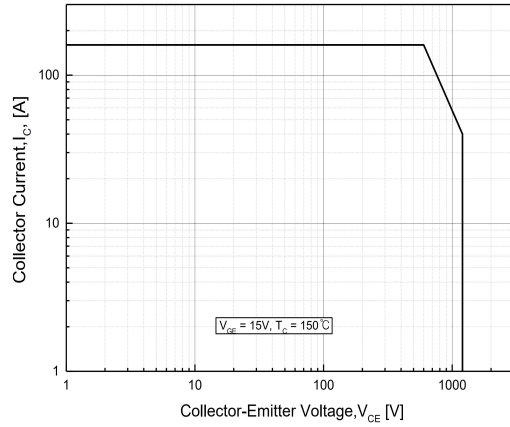
Typical Turn off-Collector Current



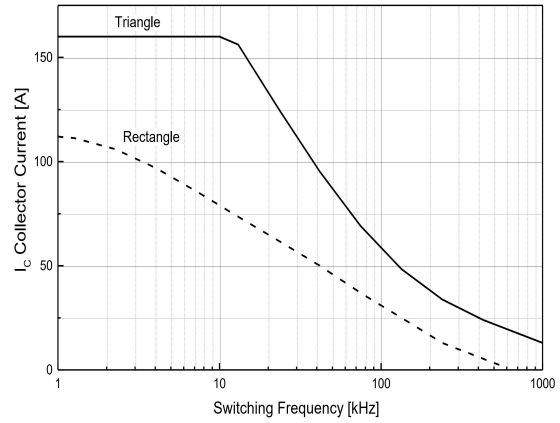
Forward Bias Safe Operating Area



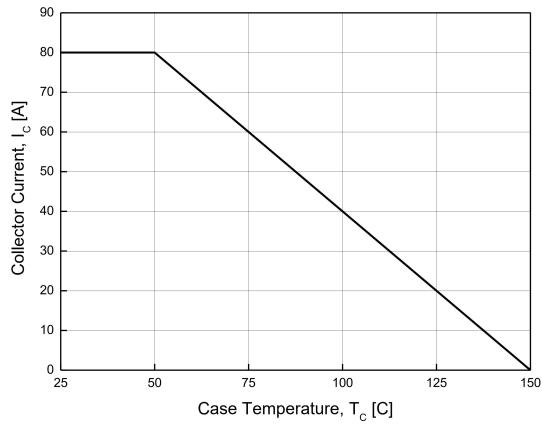
Reverse Bias Safe Operating Area



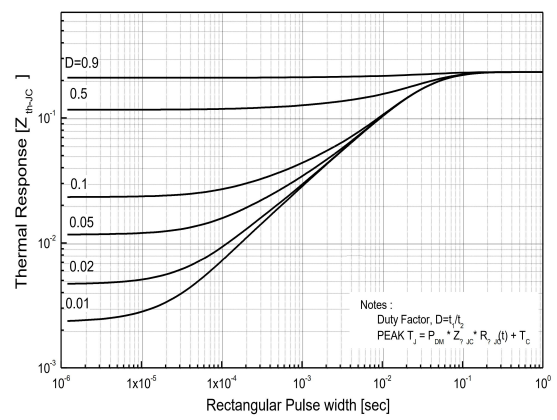
Switching frequency – Collector current



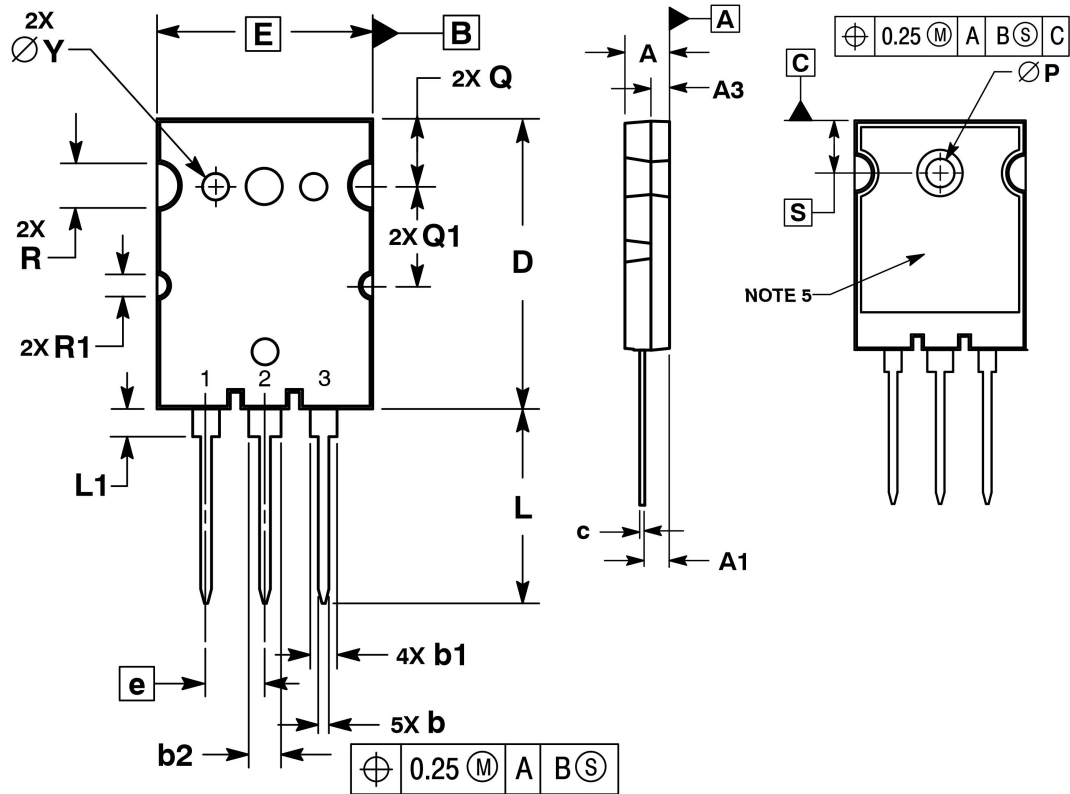
Case Temperature – Collector Current



IGBT Transient Thermal Impedance



Package outline dimension



Symbol	Min	Max	Unit	Symbol	Min	Max	Unit
A	4.80	5.20	mm	L	16.80	18.20	mm
A1	2.50	3.10		L1	2.30	2.70	
A3	2.00			P	3.10	3.50	
b	0.90	1.25		Q	5.80	6.20	
b1	2.5REF			Q1	8.80	9.20	
b2	3.0REF			R	4.0REF		
c	0.50	0.85		R1	2.0REF		
D	25.60	26.40		S	9.0BSC		
E	19.80	20.20		Y	1.8REF		
e	5.45BSC						