



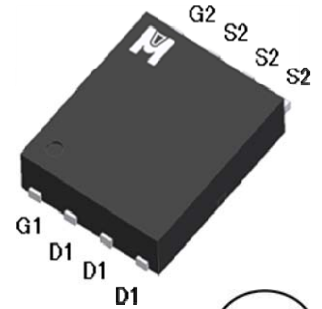
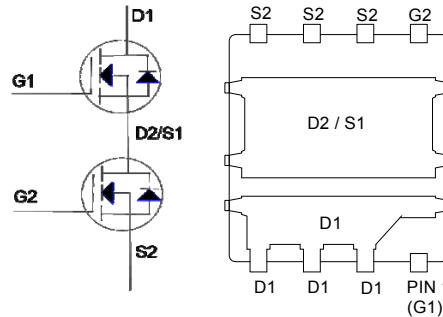
N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

	N-CH-Q1	N-CH-Q2
BV _{DSS}	30V	30V
R _{DS(on)} (MAX.)	9.5mΩ	4.5mΩ
I _D	15A	25A

UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS		UNIT
			Q1	Q2	
Gate-Source Voltage		V _{GS}	±20	±20	V
Continuous Drain Current	T _C = 25 °C	I _D	15	25	A
	T _C = 100 °C		12	18	
Pulsed Drain Current ¹		I _{DM}	60	100	
Avalanche Current		I _{AS}	15	25	
Avalanche Energy	L = 0.1mH, R _G =25Ω	E _{AS}	11.25	31.25	mJ
Repetitive Avalanche Energy ²	L = 0.05mH	E _{AR}	5.62	15.62	
Power Dissipation	T _C = 25 °C	P _D	48	100	W
	T _C = 100 °C		19	40	
Operating Junction & Storage Temperature Range		T _j , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL		TYPICAL	MAXIMUM		UNIT
	R _{θJC}	Steady State		2.6	1.25	
Junction-to-Case	R _{θJC}	Steady State		2.6	1.25	°C / W
Junction-to-Ambient	R _{θJA}	Steady State		62	55	
	R _{θJA}	t ≤ 10 s		27	24	

¹Pulse width limited by maximum junction temperature.

²Duty cycle ≤ 1%

R_{θJA} when mounted on a 1 in² pad of 2 oz copper.



ELECTRICAL CHARACTERISTICS ($T_c = 25\text{ }^\circ\text{C}$, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT	
			MIN	TYP	MAX		
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	Q1	30		V	
			Q2	30			
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	Q1	1	1.5	3	
			Q2	1	1.5	3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	Q1			± 100	nA
			Q2			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24V, V_{GS} = 0V$	Q1			1	μA
			Q2			1	
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$	Q1			25	
			Q2			25	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 10V$	Q1	15		A	
			Q2	25			
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 12A$	Q1		8.2	9.5	m Ω
		$V_{GS} = 10V, I_D = 20A$	Q2		4.0	4.5	
		$V_{GS} = 4.5V, I_D = 9A$	Q1		11	15	
		$V_{GS} = 4.5V, I_D = 15A$	Q2		4.9	6.6	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 5V, I_D = 13A$	Q1		18	S	
		$V_{DS} = 5V, I_D = 20A$	Q2		25		
DYNAMIC							
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$	Q1		828	pF	
			Q2		3150		
Output Capacitance	C_{oss}		Q1		196		
			Q2		440		
Reverse Transfer Capacitance	C_{rss}		Q1		174		
			Q2		340		
Gate Resistance	R_g	$V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz$	Q1		1.7	Ω	
			Q2		1.2		
Total Gate Charge ^{1,2}	$Q_g(V_{GS}=10V)$	$V_{DD} = 15V, V_{GS} = 10V,$ $I_D = 10A$	Q1		17.6	nC	
			Q2		53		
	$Q_g(V_{GS}=4.5V)$		Q1		12.5		
			Q2		27		



Gate-Source Charge ^{1,2}	Q_{gs}	$V_{DD} = 15V, V_{GS} = 10V,$ $I_D = 10A$	Q1		2.8		
			Q2		6		
Gate-Drain Charge ^{1,2}	Q_{gd}		Q1		7.4		
			Q2		12.4		
Turn-On Delay Time ^{1,2}	$t_{d(on)}$	$V_{DD} = 15V,$ $I_D = 1A, V_{GS} = 10V, R_{GS} = 2.7\Omega$	Q1		8	nS	
			Q2		18		
Rise Time ^{1,2}	t_r		Q1		18		
			Q2		10		
Turn-Off Delay Time ^{1,2}	$t_{d(off)}$		Q1		20		
			Q2		45		
Fall Time ^{1,2}	t_f	Q1		12			
		Q2		20			
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C = 25^\circ C$)							
Continuous Current	I_S		Q1		15	A	
			Q2		25		
Pulsed Current ³	I_{SM}		Q1		60		
			Q2		100		
Forward Voltage ¹	V_{SD}		$I_F = 10A, V_{GS} = 0V$	Q1		1.3	V
				Q2		1.3	
Reverse Recovery Time	t_{rr}	Q1		22	nS		
		$I_F = 10A, di_F/dt = 100A / \mu S$	Q2			30	
Reverse Recovery Charge	Q_{rr}	Q2		6	nC		
		$I_F = 10A, di_F/dt = 100A / \mu S$	Q2			20	

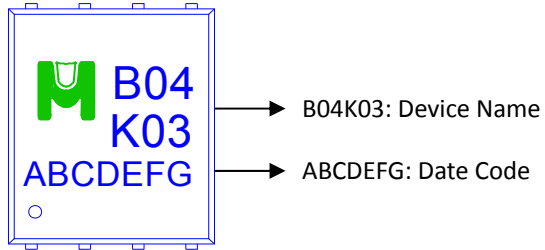
¹Pulse test : Pulse Width $\leq 300 \mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

³Pulse width limited by maximum junction temperature.

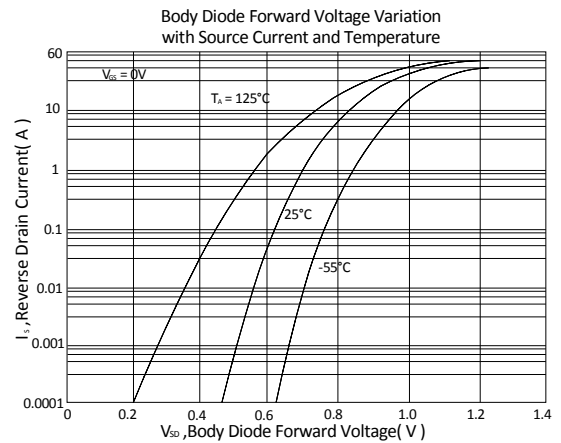
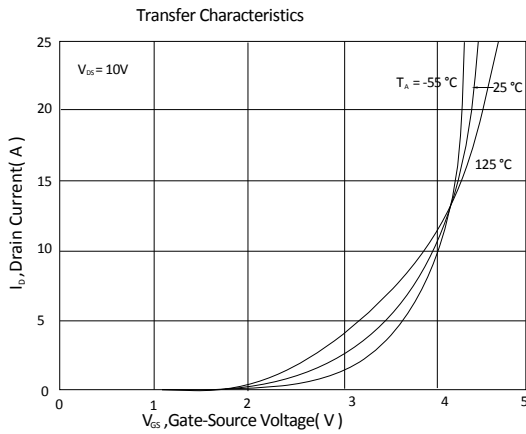
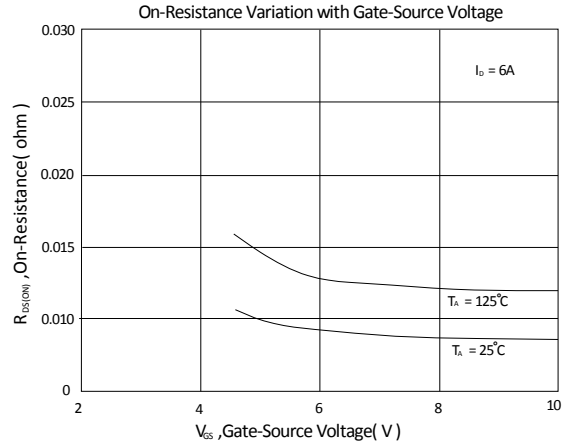
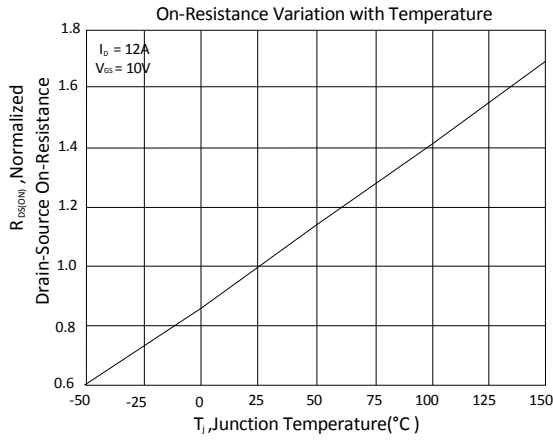
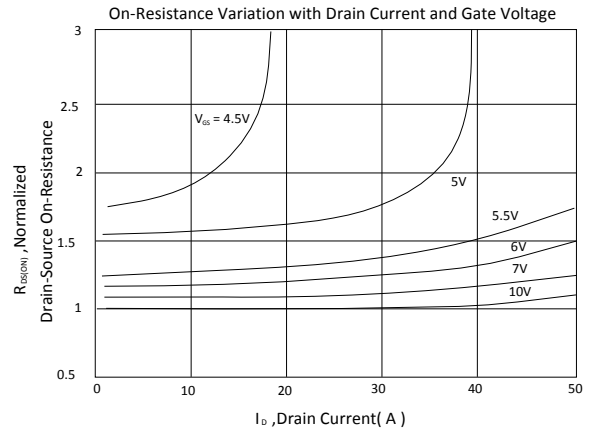
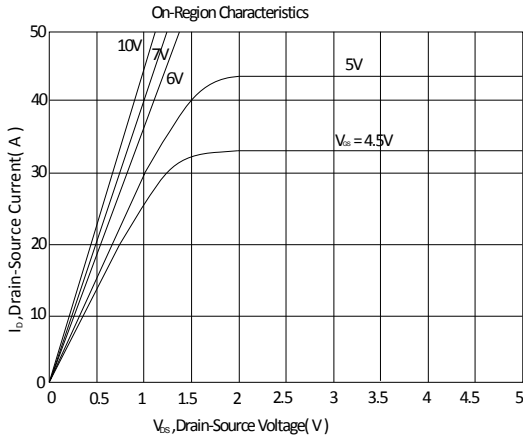
Ordering & Marking Information:

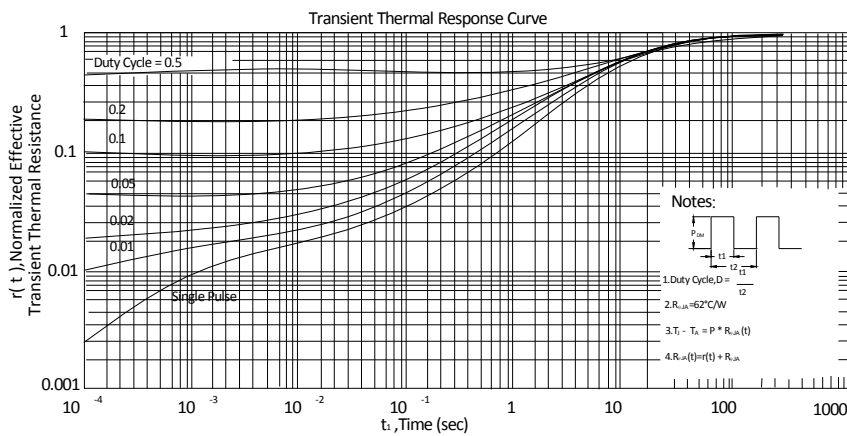
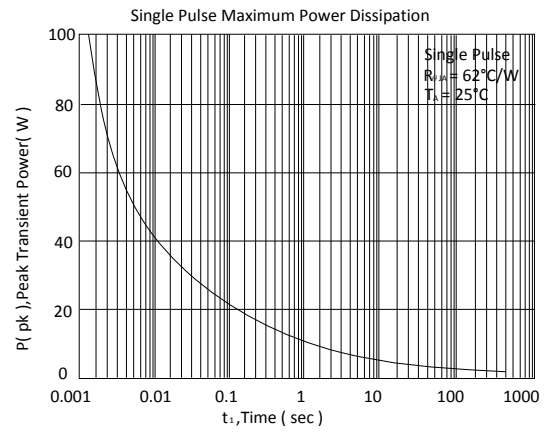
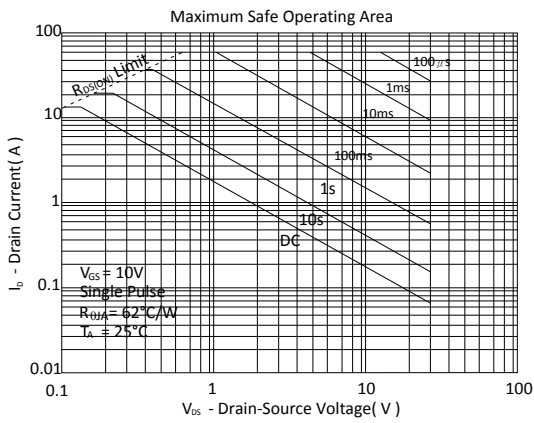
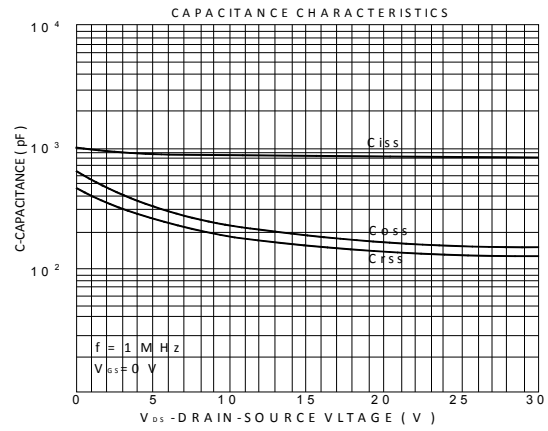
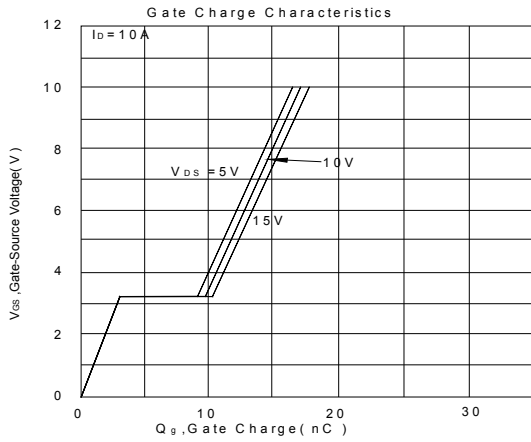
Device Name: EMB04K03HP for Asymmetric Dual EDFN 5 x 6





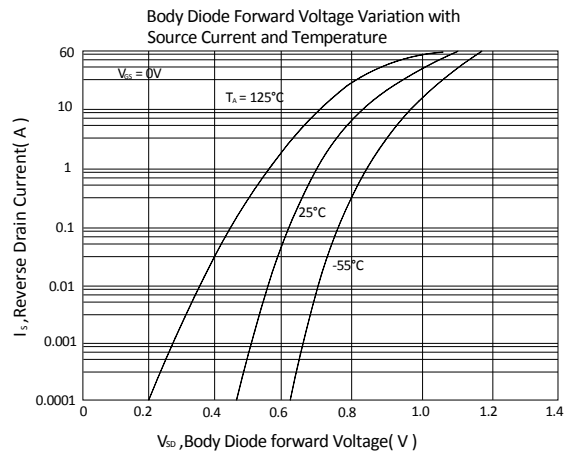
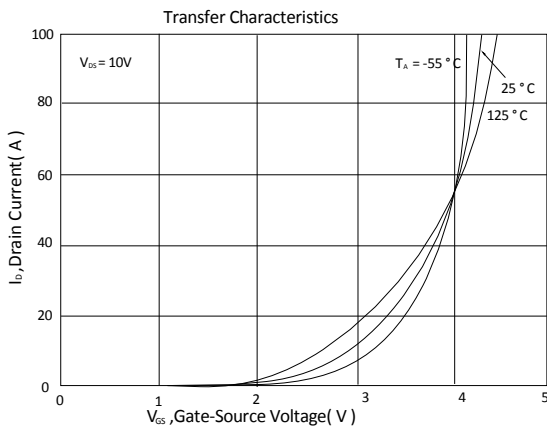
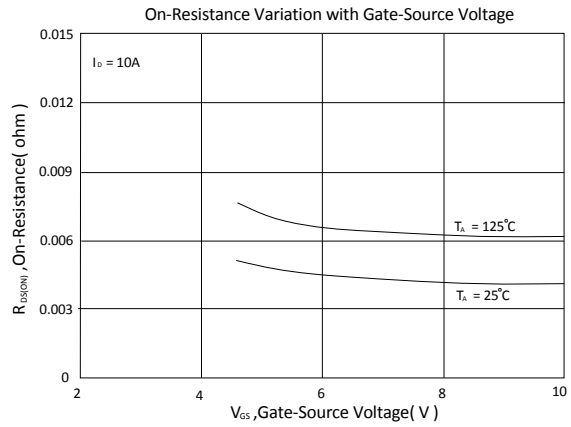
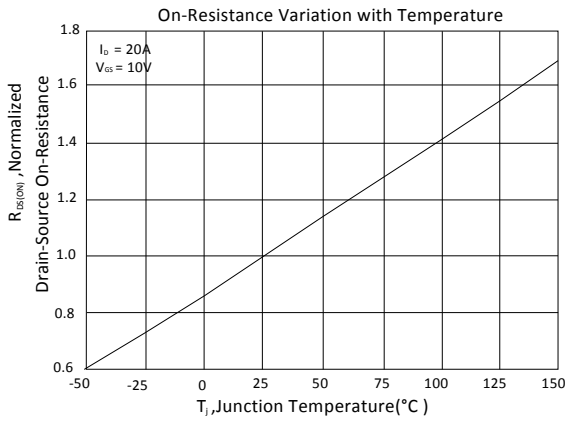
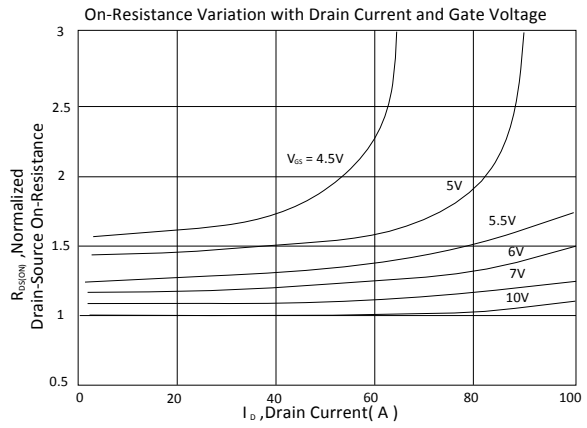
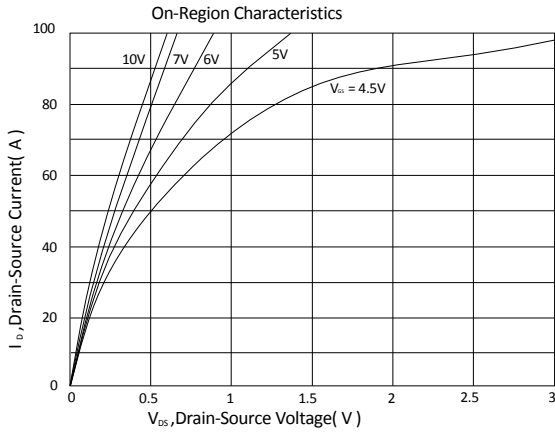
Q1 TYPICAL CHARACTERISTICS

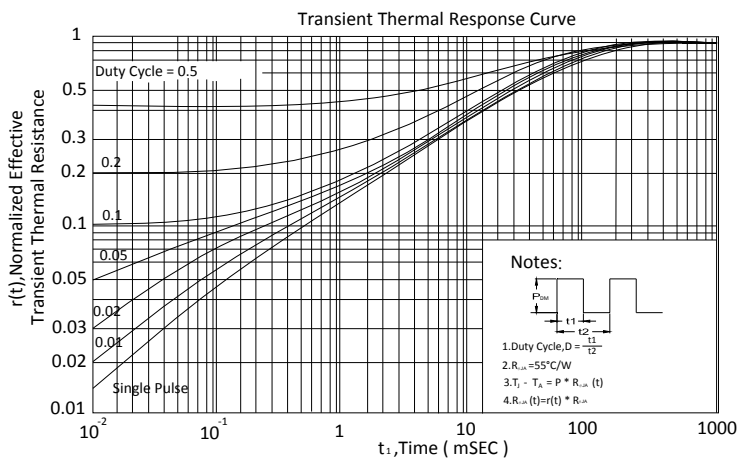
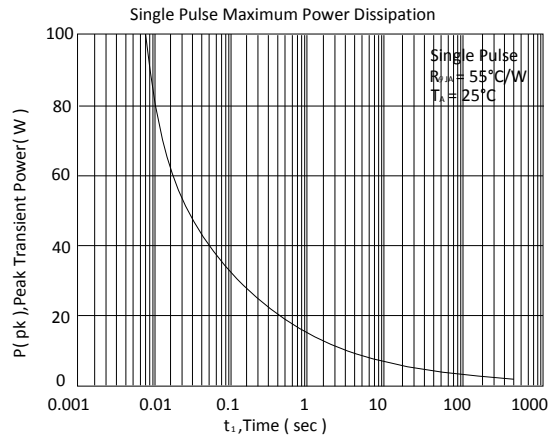
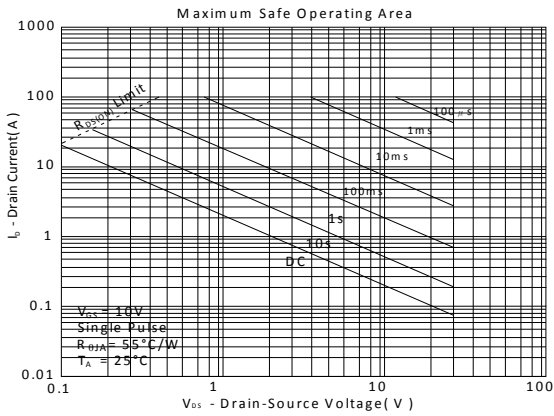
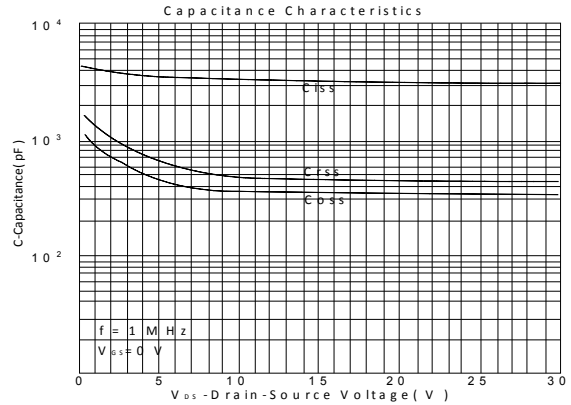
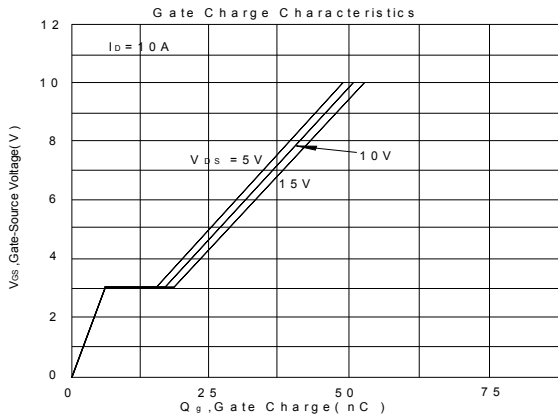






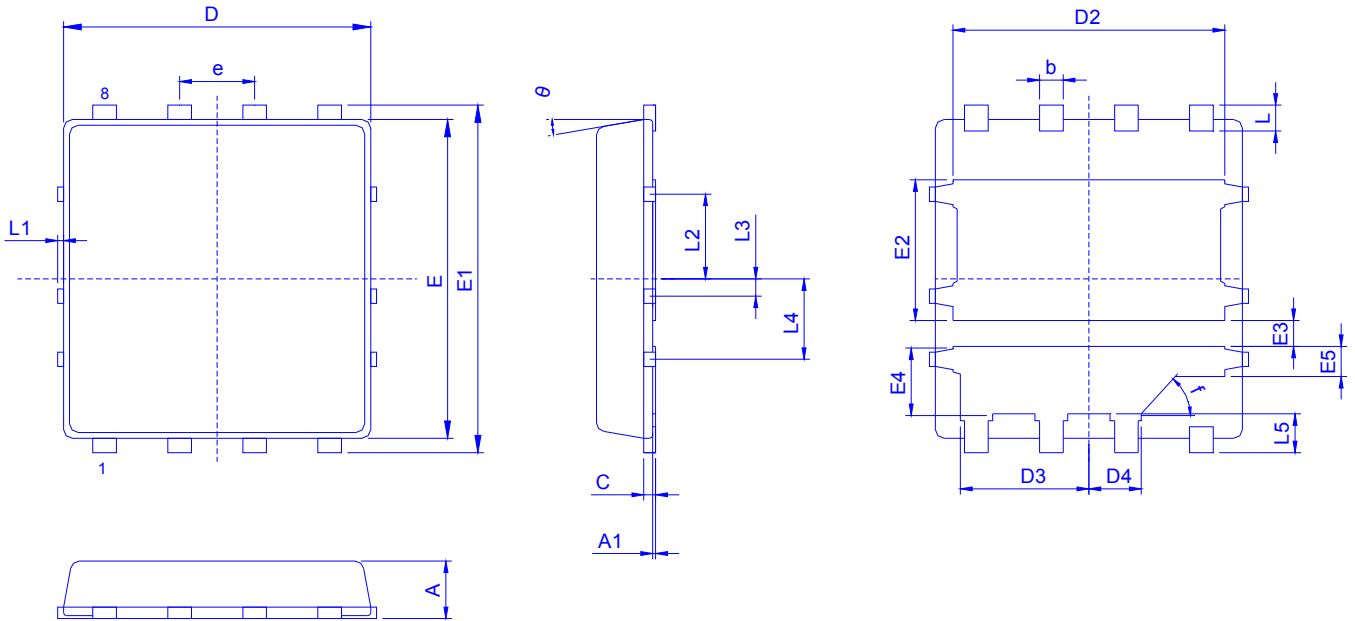
Q2 TYPICAL CHARACTERISTICS







Outline Drawing

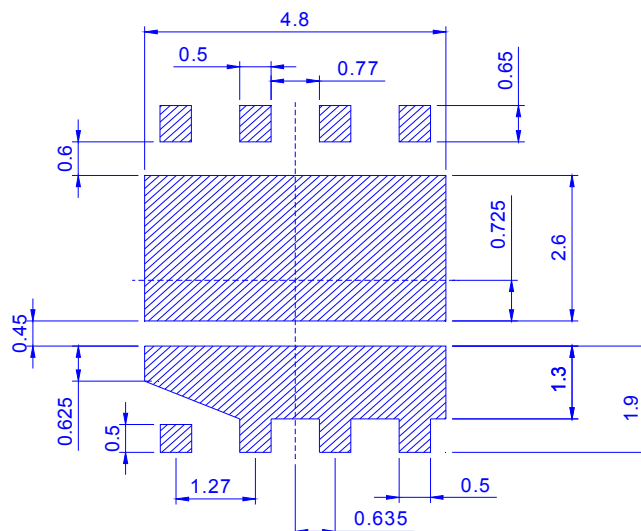


Dimension in mm

Dimension	A	A1	b	c	D	D2	D3	D4	E	E1	E2	E3	E4	E5
Min.	0.85	0.00	0.35	0.15		4.5	2.125	0.835			2.4	0.40	1.125	0.475
Typ.	0.90		0.40	0.20	5.2	4.6	2.175	0.885	5.55	6.05	2.45	0.45	1.175	0.525
Max.	1.00	0.05	0.45	0.25		4.7	2.225	0.935			2.5	0.50	1.225	0.575

Dimension	e	L	L1	L2	L3	L4	L5	F	θ
Min.		0.35	0	1.375	0.2	1.3	0.575		0°
Typ.	1.27	0.45		1.475	0.3	1.4	0.675	45°	
Max.		0.55	0.1	1.575	0.4	1.5	0.775		10°

Recommended minimum pads



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