

Features

- 250V/82A,
 $R_{DS(ON)} = 28m\Omega(Typ.)@V_{GS}=10V$
- Low $R_{DS(ON)}$
- Planar Technology
- Reliable and Rugged
- 100% Avalanche Tested
- 100% Rg Tested

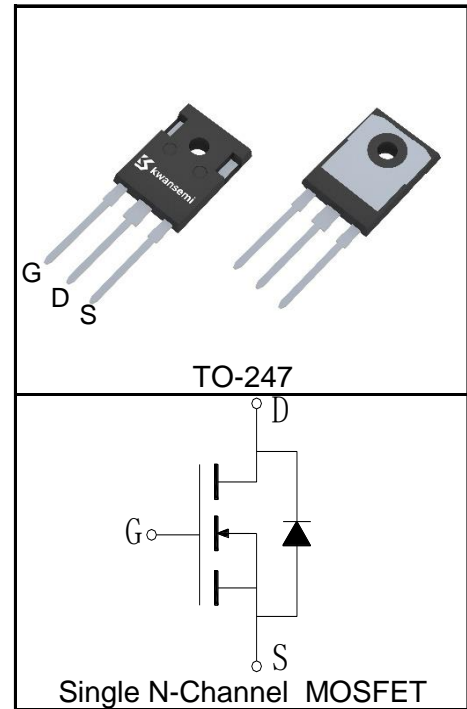
Applications

- DC-DC Converters and Off-line UPS
- Power Management in Inverter System



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage	250	V	
V_{GSS}	Gate-Source Voltage	± 30		
T_{Jmax}	Maximum Junction Temperature	175	$^\circ\text{C}$	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	82	A
Mounted on Large Heat Sink				
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	328	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$	82	A
		$T_C=100^\circ\text{C}$	58	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	681	W
		$T_C=100^\circ\text{C}$	340	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.22	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient		50	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings				
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed		2756	mJ

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

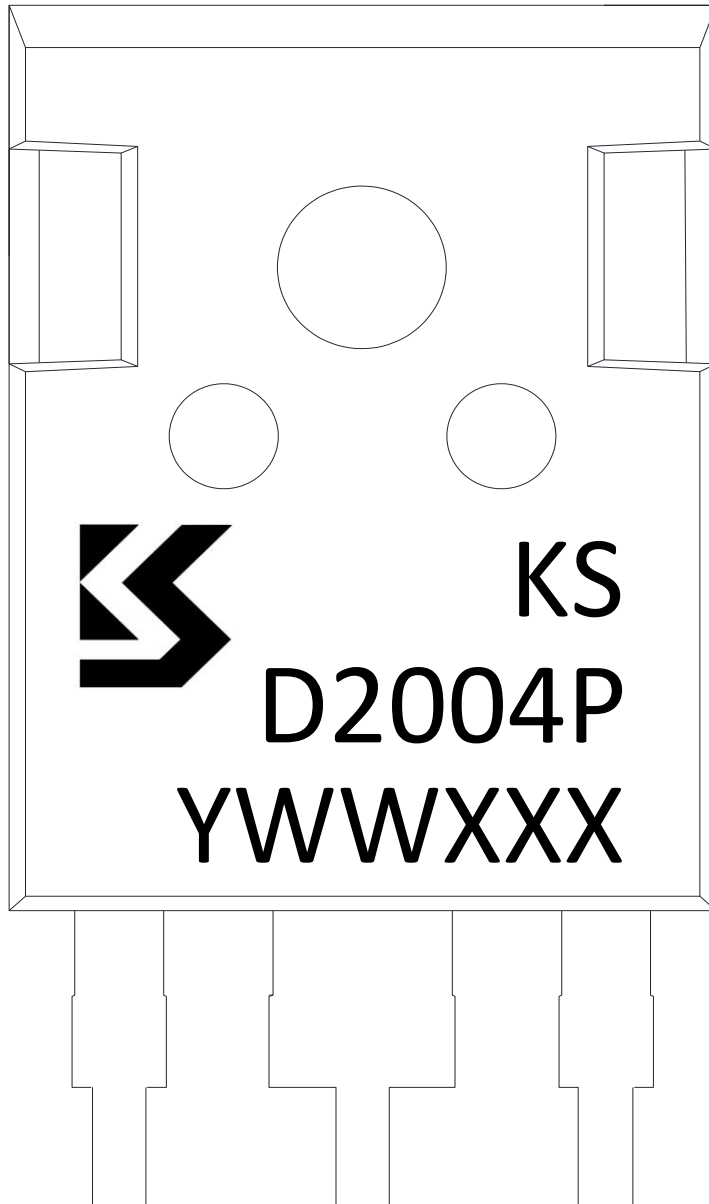
Symbol	Parameter	Test Condition	KSD2004PAP			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	250			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=250V, V_{GS}=0V$			1	μA
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		28	35	$m\Omega$
		$V_{GS}=6V, I_{DS}=20A$		30	40	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.83	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		305		ns
Q_{rr}	Reverse Recovery Charge			1940		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.3		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=125V,$ Frequency=1.0MHz		5445		pF
C_{oss}	Output Capacitance			370		
C_{rss}	Reverse Transfer Capacitance			215		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=125V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=6\Omega$		55		ns
t_r	Turn-on Rise Time			109		
$t_{d(OFF)}$	Turn-off Delay Time			127		
t_f	Turn-off Fall Time			88		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=125V, V_{GS}=10V,$ $I_{DS}=40A$		386		nC
Q_{gs}	Gate-Source Charge			24		
Q_{gd}	Gate-Drain Charge			215		

Notes:

- ① Pulse width limited by safe operating area.
- ② Calculated continuous current based on maximum allowable junction temperature.
- ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
- ④ Limited by T_{Jmax} , Starting $T_J = 25^\circ\text{C}$, $I_{ASmax} = 105A$, $L = 0.5\text{mH}$, $V_{DD} = 80V$, $R_G = 25\Omega$, $V_{GS} = 10V$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 76A$, $L = 0.5\text{mH}$.
- ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KSD2004PAP	TO-247	Tube	30	-	-

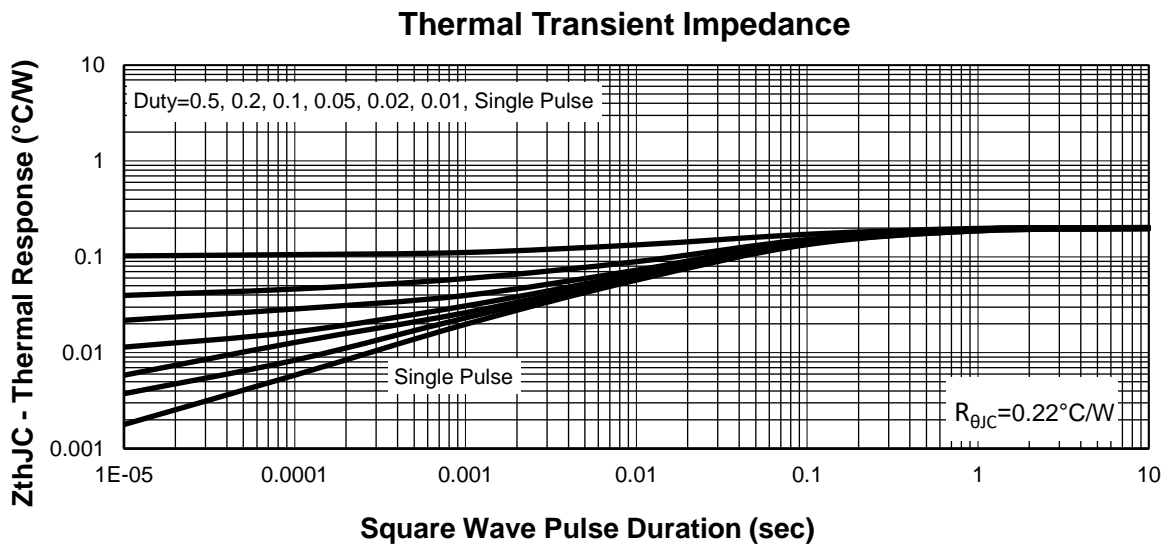
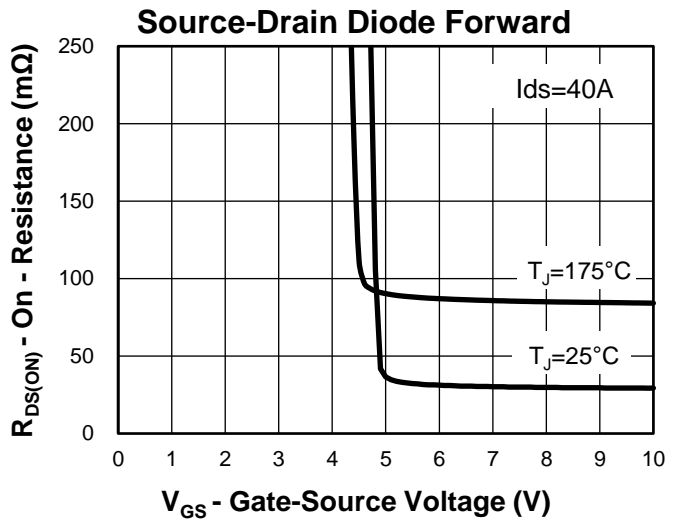
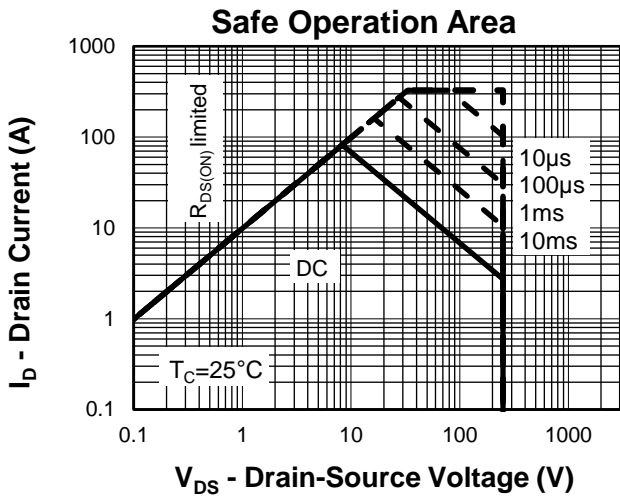
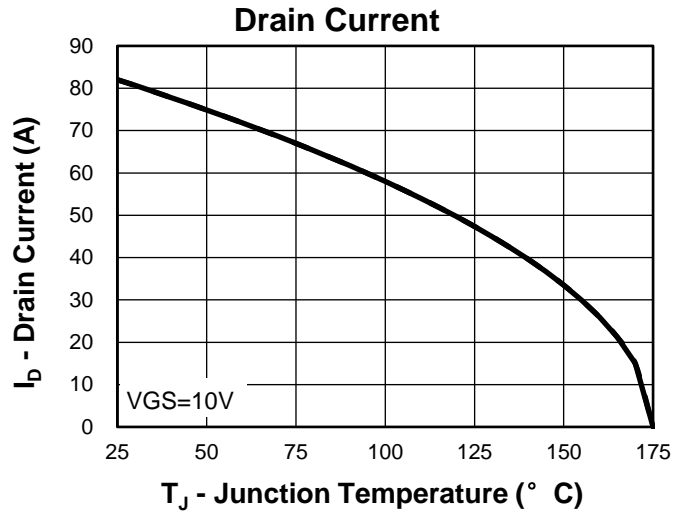
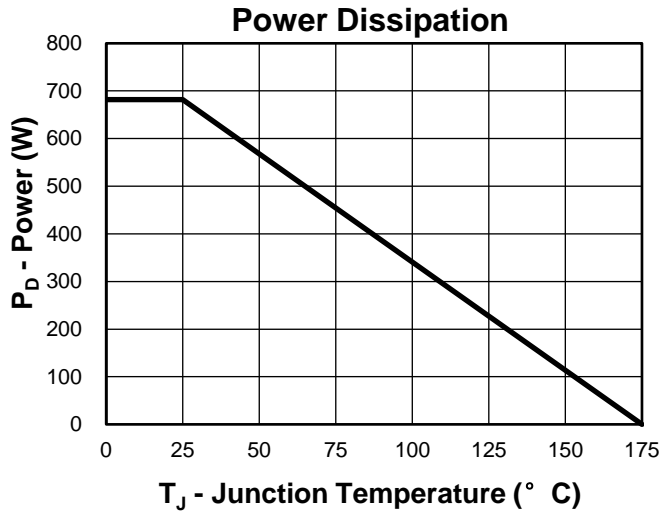


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

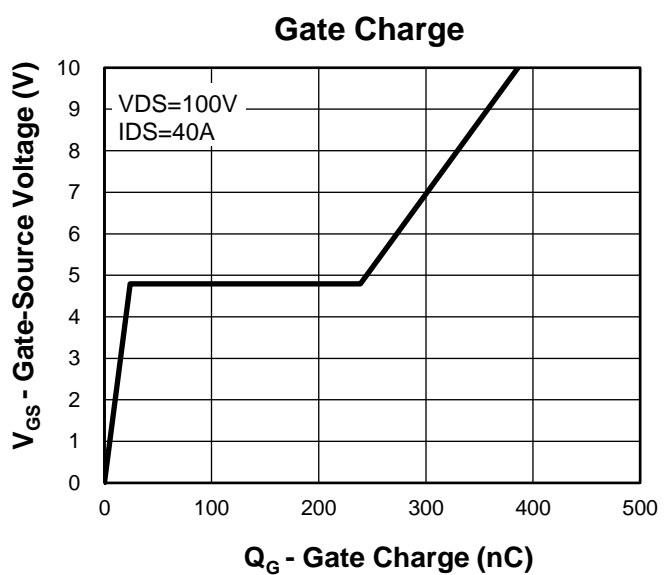
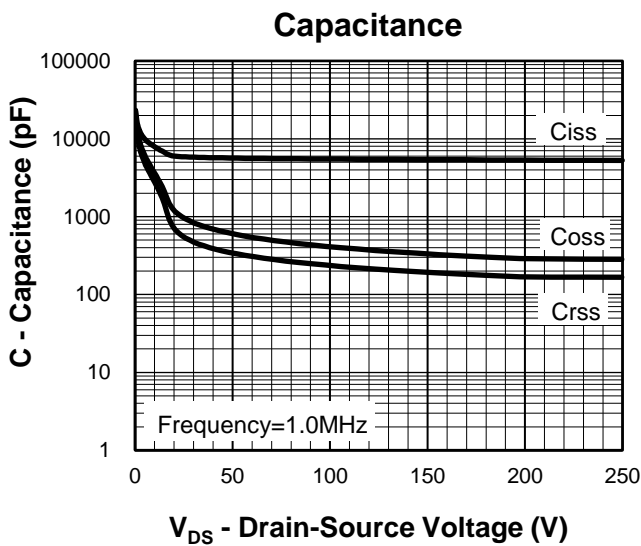
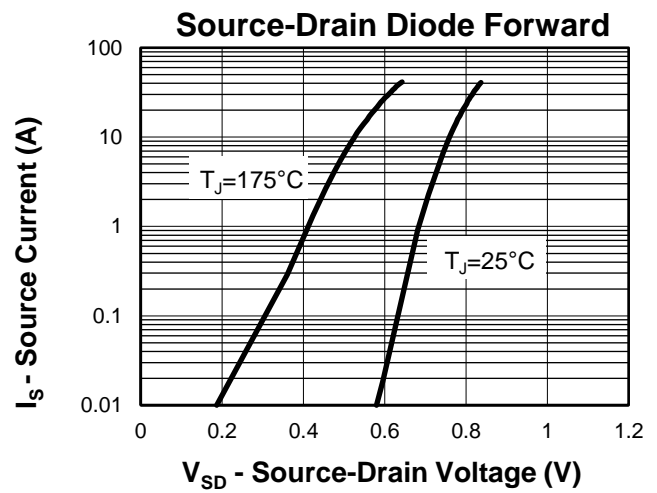
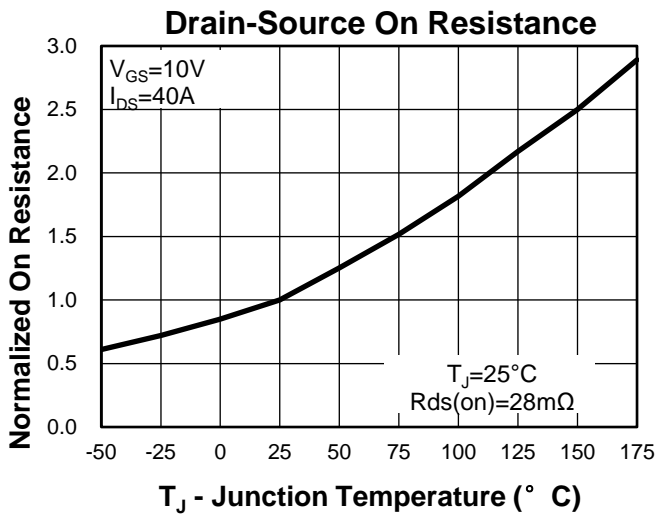
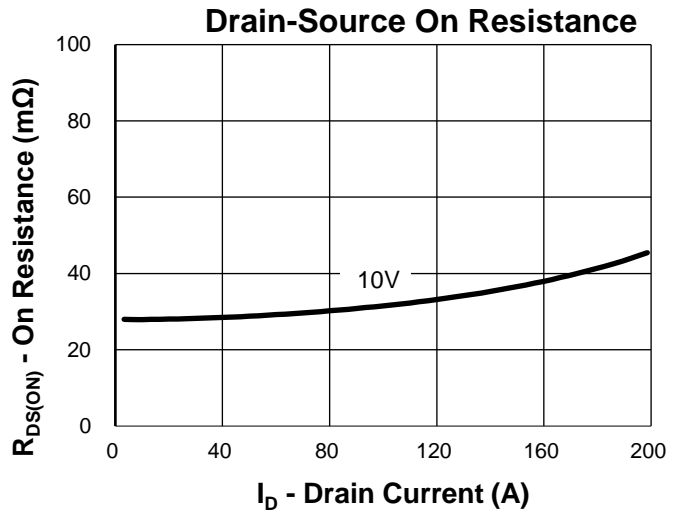
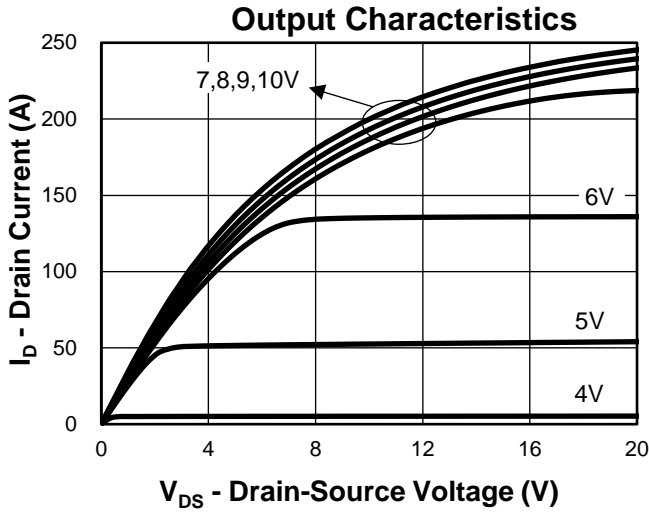
2nd Line: Part Number(D2004P)

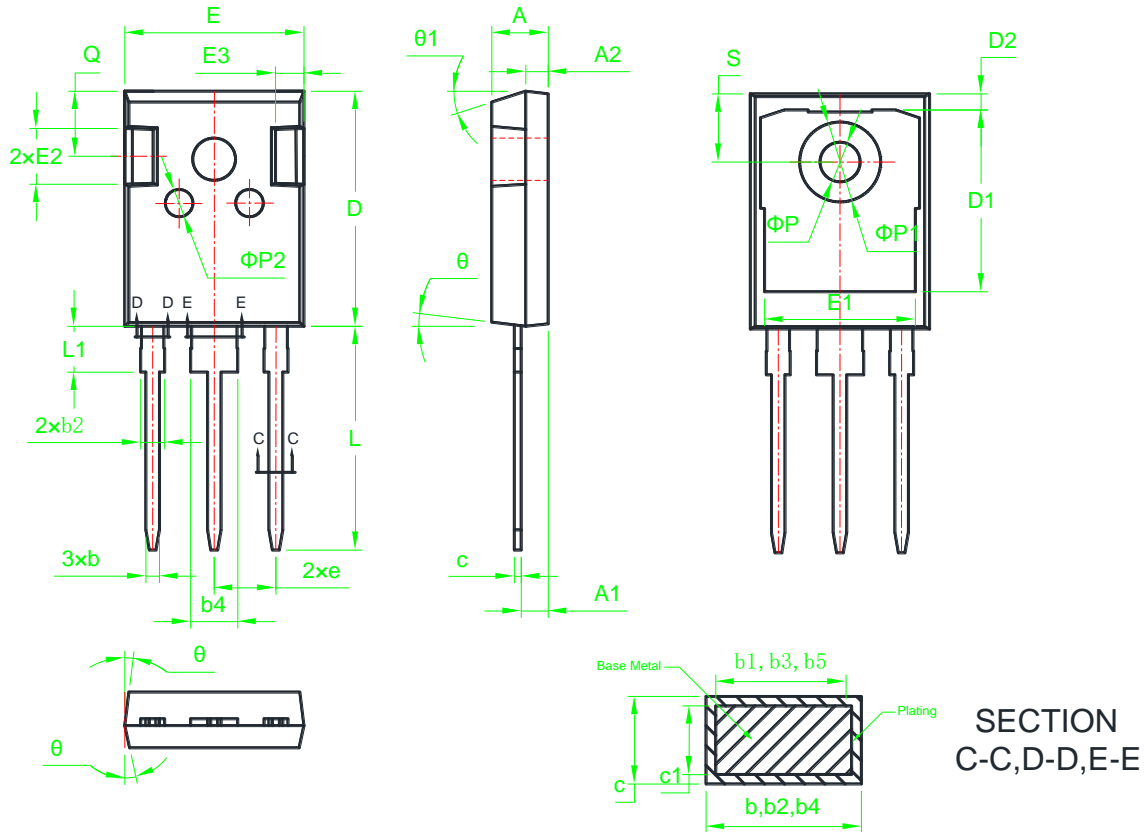
3rd Line: Lot Number(YWWXXX)

Typical Characteristics



Typical Characteristics

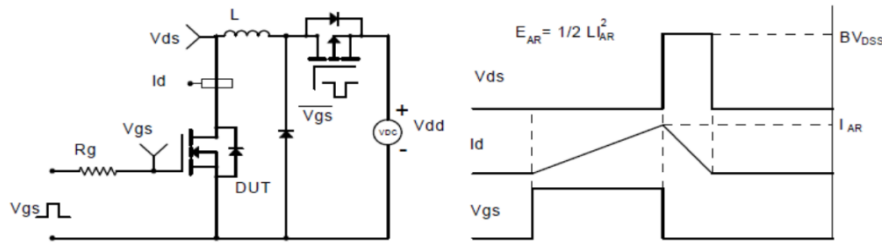


Package Information
TO-247

**SECTION
C-C,D-D,E-E**

SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.90	5.00	5.10	0.193	0.197	0.201	E	15.70	15.80	15.90	0.618	0.622	0.626
A1	2.31	2.41	2.51	0.091	0.095	0.099	E1	13.10	13.30	13.50	0.516	0.524	0.531
A2	1.90	2.00	2.10	0.075	0.079	0.083	E2	4.90	5.00	5.10	0.193	0.197	0.201
b	1.16	1.21	1.26	0.046	0.048	0.050	E3	2.40	2.50	2.60	0.094	0.098	0.102
b1	1.15	1.20	1.25	0.045	0.047	0.049	e	5.44BSC			0.214BSC		
b2	1.95	2.10	2.15	0.077	0.083	0.085	L	19.80	19.92	20.10	0.780	0.784	0.791
b3	1.94	2.09	2.14	0.076	0.082	0.084	L1	*	*	4.30	*	*	0.169
b4	3.10	3.15	3.20	0.122	0.124	0.126	Q	5.60	5.80	6.00	0.220	0.228	0.236
b5	3.09	3.14	3.19	0.122	0.124	0.126	S	6.05	6.15	6.25	0.238	0.242	0.246
c	0.59	0.61	0.66	0.023	0.024	0.026	ØP	3.50	3.60	3.70	0.138	0.142	0.146
c1	0.58	0.60	0.65	0.023	0.024	0.026	ØP1	7.00	7.20	7.40	0.276	0.283	0.291
D	20.90	21.00	21.10	0.823	0.827	0.831	ØP2	2.40	2.50	2.60	0.094	0.098	0.102
D1	16.25	16.55	16.85	0.640	0.652	0.663	θ	5°	7°	9°	5°	7°	9°
D2	1.05	*	1.35	0.041	*	0.053	θ 1	13°	16°	19°	13°	16°	19°

Note: Dimensions do not inclusive burrs and mold flash.

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

Kwansemi Semiconductor Co.,Ltd

Email:Sales@kwansemi.com

Web:www.kwansemi.com

DISCLAIMER:

Kwansemi reserves the right to change the specifications and circuitry without notice at any time. The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. Seller's customers using or selling Seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.