

## 600V N-Channel Super Junction MOSFET

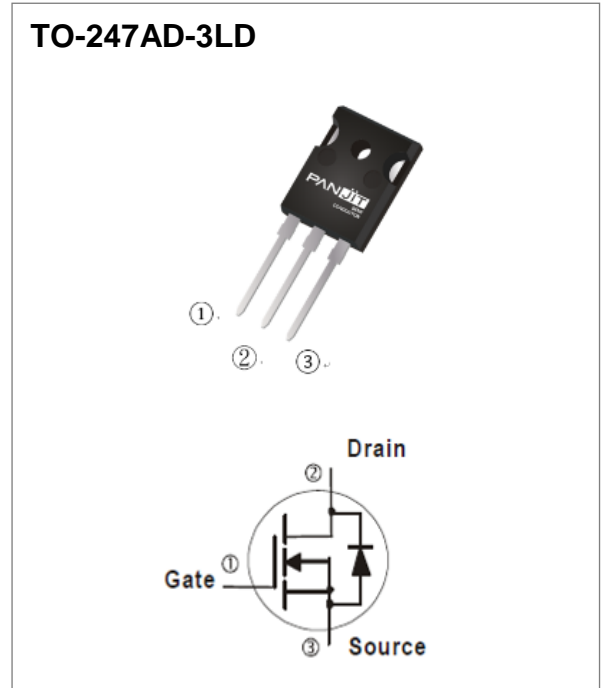
<b>Voltage</b>	<b>600 V</b>	<b>Rdson</b>	<b>74 mΩ</b>
<b>Current</b>	<b>53 A</b>	<b>Qg</b>	<b>84 nC</b>

### Feature:

- $R_{DS(ON) Max}$ ,  $V_{GS}@10V$ : 74mΩ
- Fast recovery  $Q_{rr}$  /  $T_{rr}$  performance.
- High Speed Switching and Low  $R_{DS(ON)}$
- 100% Avalanche Tested
- 100% Rg Tested
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case: TO-247AD-3LD package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 6.231 grams



### Application

- PFC, TV Power, PC Power, PD Charger, Adapter, UPS

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage @ $T_{jmax}$		$V_{DS}$	650	V
Drain-Source Voltage		$V_{DS}$	600	
Gate-Source Voltage		$V_{GS}$	$\pm 30$	
Continuous Drain Current	$T_C=25^\circ\text{C}$	$I_D$	53	A
	$T_C=100^\circ\text{C}$		33	
Pulsed Drain Current		$I_{DM}$	117	A
Single Pulse Avalanche Energy		$E_{AS}$	1750	mJ
MOSFET dv/dt ruggedness		dv/dt	100	V/ns
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	446	W
	$T_C=100^\circ\text{C}$		178	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$

### Thermal Characteristics

PARAMETER		SYMBOL	MAXIMUM	UNITS
Thermal Resistance	Junction-to-Case	$R_{\theta JC}$	0.3	$^\circ\text{C/W}$
	Junction-to-Ambient (Note 3)	$R_{\theta JA}$	50	$^\circ\text{C/W}$

## Electrical Characteristics (T<sub>A</sub> = 25 °C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =1mA	600	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.5	3.5	4.5	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =26.5A <sup>(Note1)</sup>	-	63	74	mΩ
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V	-	-	10	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	-	-	±100	nA
Transfer characteristics	gfs	V <sub>DS</sub> =20V, I <sub>D</sub> =26.5A	-	27	-	S
<b>Dynamic</b> <sup>(Note 5)</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, I <sub>D</sub> =26.5A, V <sub>GS</sub> =10V	-	84	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	21	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	33	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =400V, V <sub>GS</sub> =0V, f=250kHz	-	3871	-	pF
Output Capacitance	C <sub>oss</sub>		-	108	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	7.5	-	
Effective Output Capacitance Energy Related	C <sub>o(er)</sub>		V <sub>DS</sub> =0V to 400V, V <sub>GS</sub> =0V, f=250kHz <sup>(Note 4)</sup>	-	160	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =300V, I <sub>D</sub> =26.5A, V <sub>GS</sub> =10V, R <sub>G</sub> =25Ω <sup>(Note 2)</sup>	-	70	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	96	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	237	-	
Turn-Off Fall Time	t <sub>f</sub>		-	90	-	
Gate Resistance	R <sub>g</sub>	f=1.0MHz	-	0.7	-	Ω
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>		-	-	53	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =26.5A, V <sub>GS</sub> =0V	-	0.9	1.5	V
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>S</sub> =26.5A	-	1.0	-	μC
Reverse Recovery Time	T <sub>rr</sub>	di/dt=100A/μs	-	150	-	ns

### NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance.
4. C<sub>o(er)</sub> is a capacitance that gives the same stored energy as C<sub>oss</sub> while V<sub>DS</sub> is rising from 0V to 80% V<sub>(BR)DSS</sub>
5. Guaranteed by design, not subject to production testing

TYPICAL CHARACTERISTIC CURVES

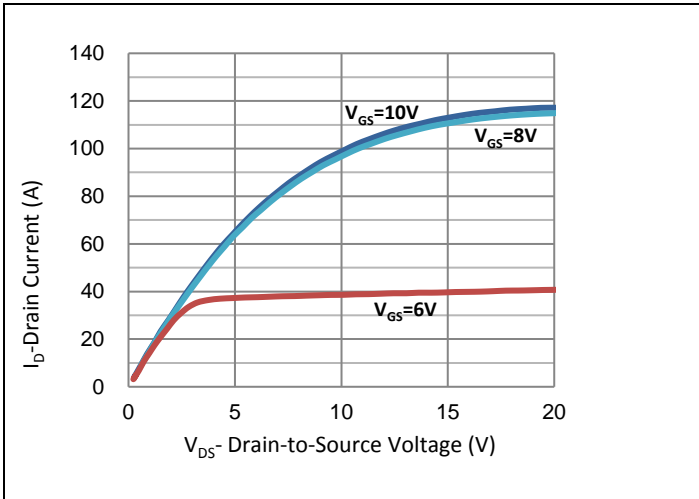


Fig.1 Output Characteristics

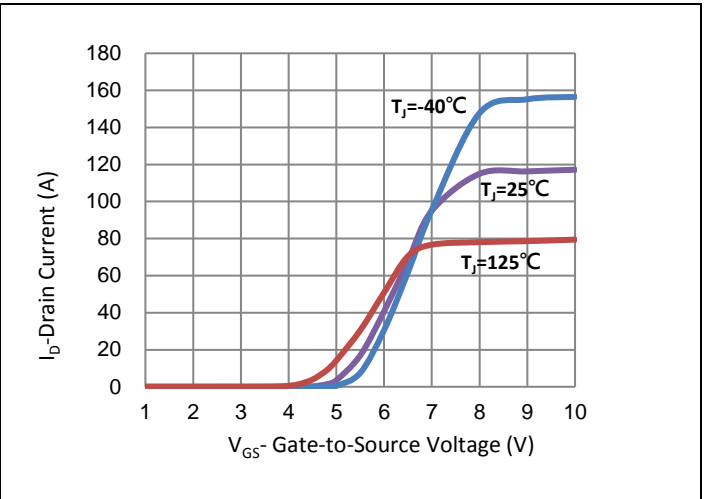


Fig.2 Transfer Characteristics

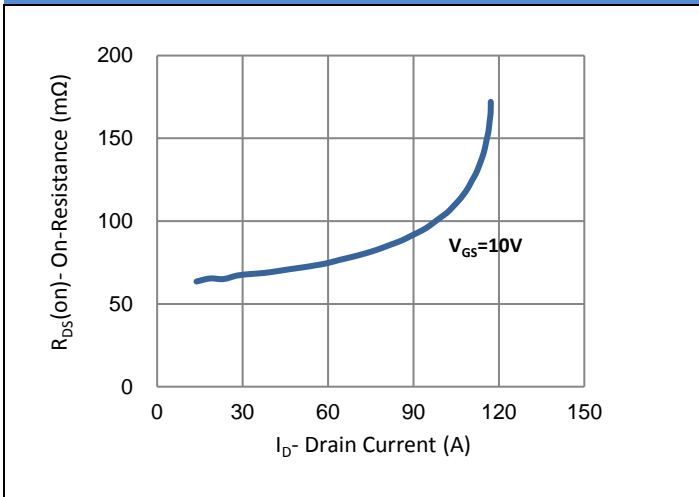


Fig.3 On-Resistance vs. Drain Current

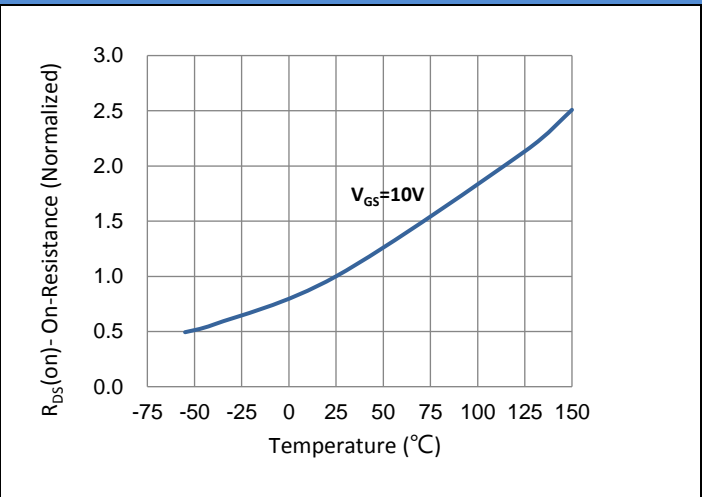


Fig.4 On-Resistance vs. Junction Temperature

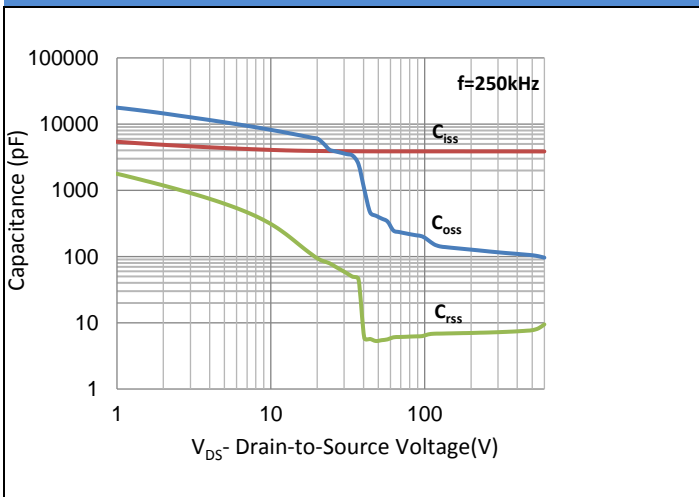


Fig.5 Capacitance vs. Drain-Source Voltage

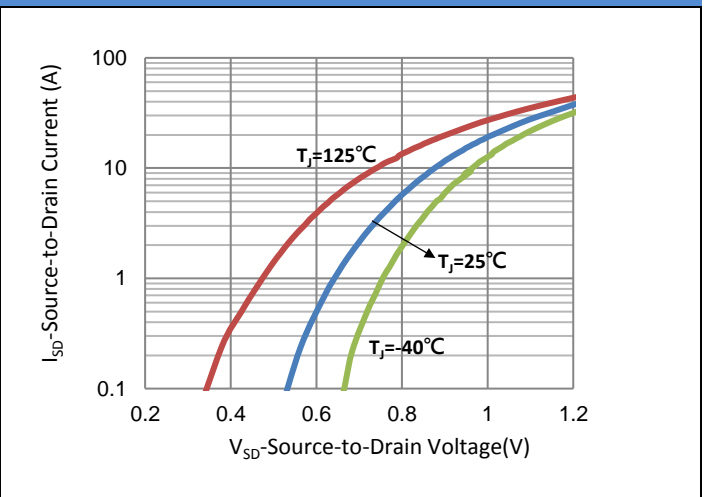
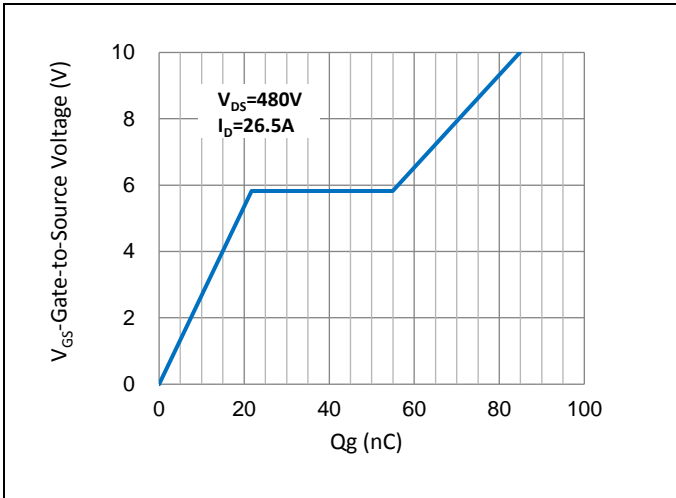
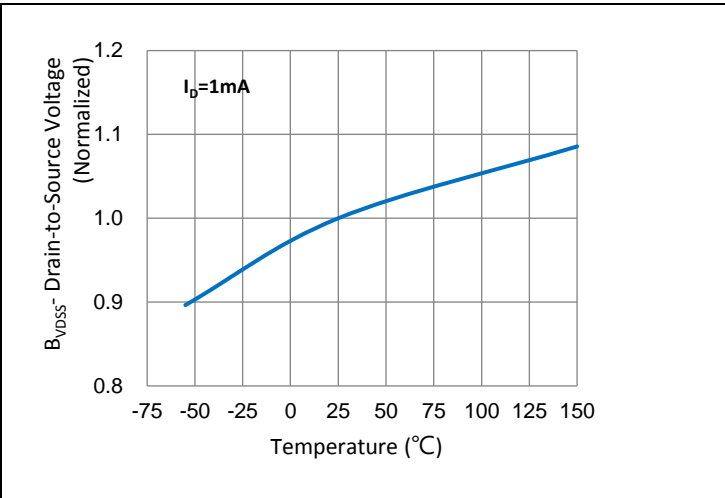


Fig.6 Source-Drain Diode Forward Voltage

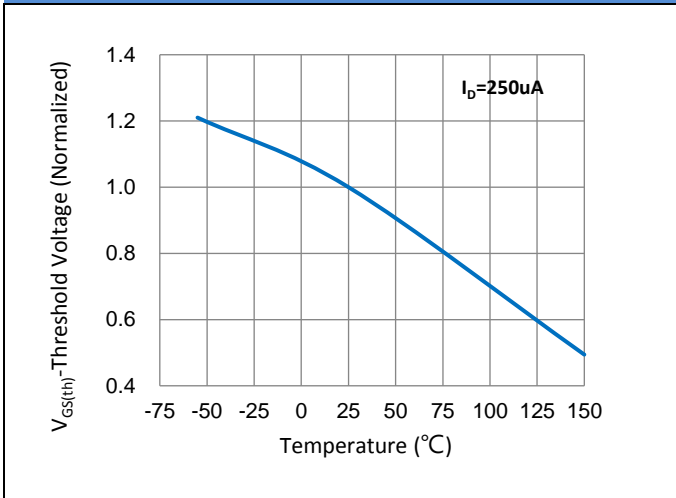
**TYPICAL CHARACTERISTIC CURVES**



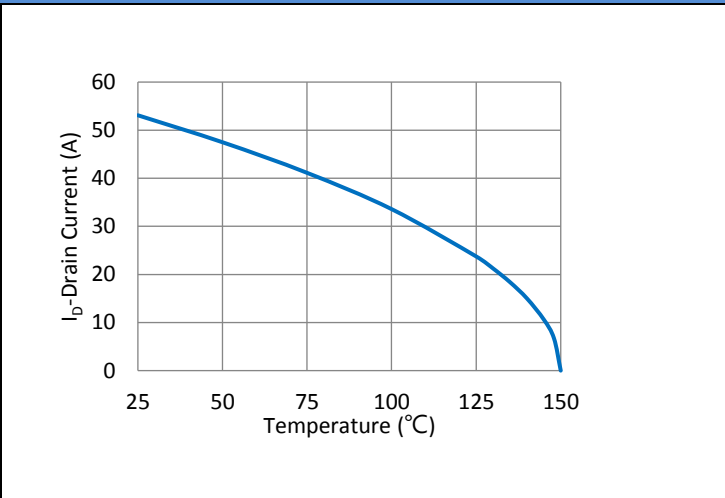
**Fig.7 Gate-Charge Characteristics**



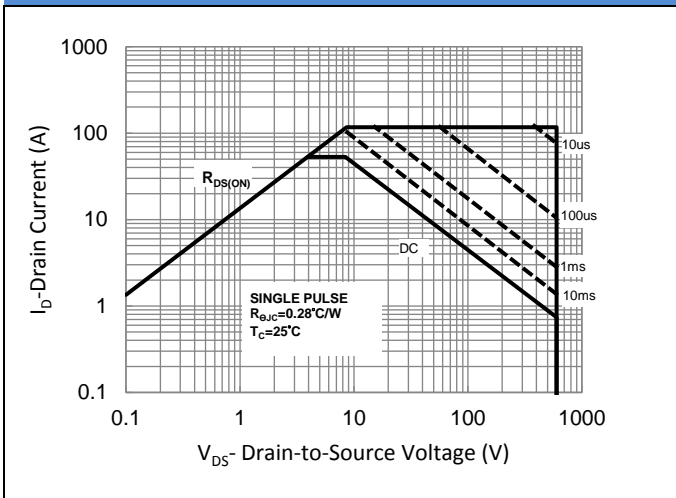
**Fig.8 Breakdown Voltage Variation vs. Temperature**



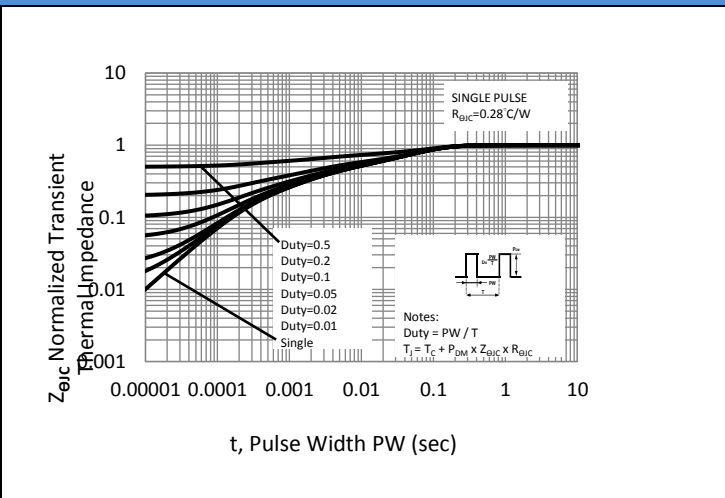
**Fig.9 Threshold Voltage Variation with Temperature**



**Fig.10 Drain Current vs. Case Temperature**

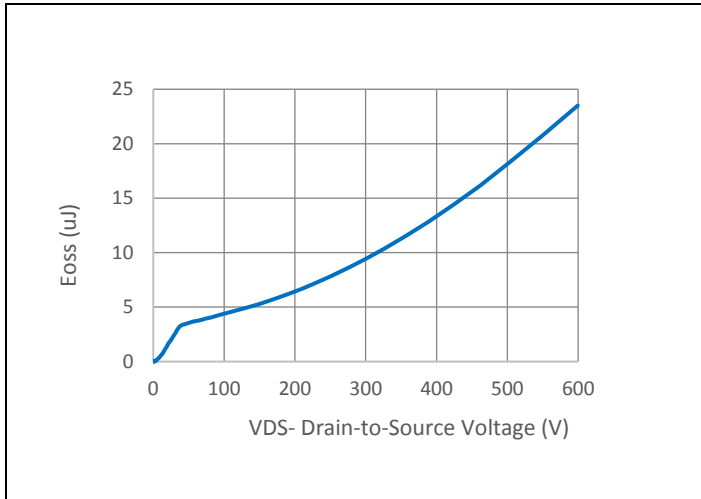


**Fig.11 Maximum Safe Operating Area**



**Fig.12 Normalized Transient Thermal Impedance**

TYPICAL CHARACTERISTIC CURVES

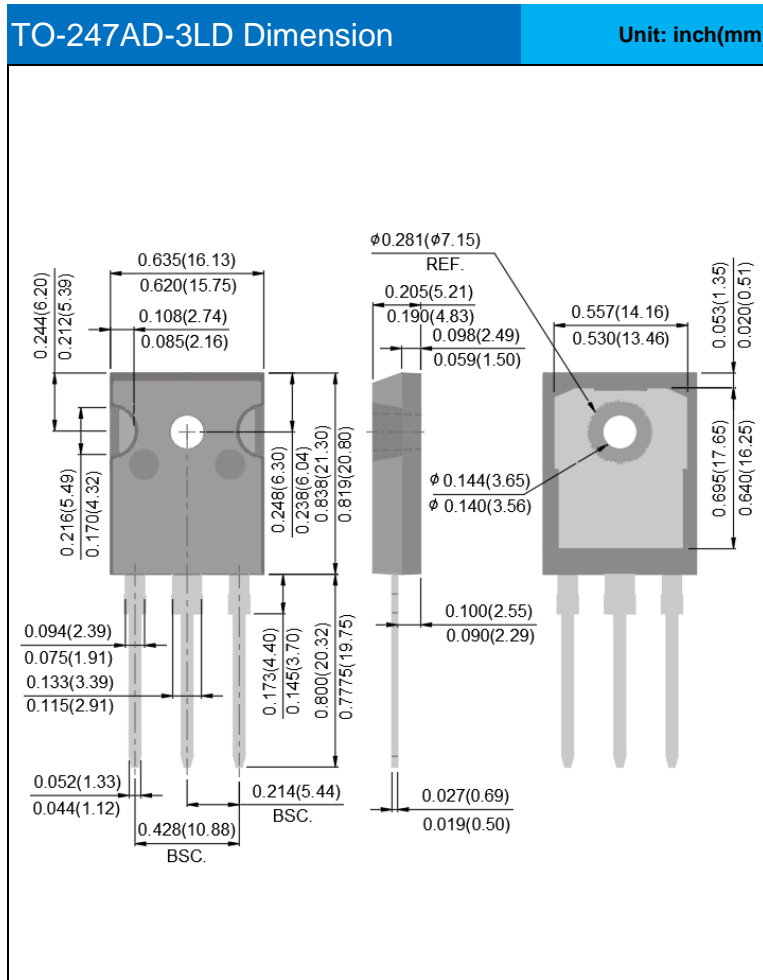


**Fig.13 Typ. Coss Stored Energy**

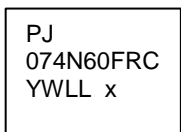
**Product and Packing Information**

Part No.	Package Type	Packing Type	Marking
PJM074N60FRC	TO-247AD-3LD	30pcs / Tube	074N60FRC

**Packaging Information**



**Marking Diagram**



- Y** = Year Code
- W** = Week Code (A~Z)
- LL** = Lot Code (00~99)
- x** = Production Line Code